windtest
grevenbroich gmbh

Landkreis Cuxhaven
Amt 63
21. Okt. 2024
.....

Ermittlung der optischen Immissionen für den Windenergieanlagenstandort Lamstedt

2024-08-26

SW24020B1

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid

ImG 03 / 2024

zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

Bankverbindung / Bankaccount Sparkasse Neuss · BLZ 305 500 00 · Kto.-Nr. 800 272 04 · IBAN DE: 74 305 500 00 00 800 272 04 · BIC: WELA DE DN

windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
41517 Grevenbroich · Germany
Phone +49 (0) 2181-22 78-0
Fax +49 (0) 2181-22 78-11

www.windtest-nrw.de
info@windtest-nrw.de

Geschäftsführerin / Managing Director
Dipl.-Geol. Monika Krämer

Handelsregister / Commercial Register
Amtsgericht Mönchengladbach · HRB 7758
USt.-IdNr. / VAT No.: DE 183895079
Steuer-Nr. / Tax-ID. 114/5860/4068

windtest
grevenbroich gmbh

Schattenwurfprognose SW24020B1

Standort	21769 Lamstedt / Niedersachsen
Auftraggeber	NeXtWind Windpark Beteiligung II GmbH & Co.KG Marburger Straße 3 10789 Berlin
Auftragnehmer	windtest grevenbroich gmbh Frimmersdorfer Str. 73a 41517 Grevenbroich
Auftragsdatum	2024-03-25
Auftragsnummer	24 0176 07

Geprüft von

Lasma Pikuma, M.Eng.
Projektmanagerin Site Assessment

Bearbeitet von

Dipl.-Ing. (FH) Florian Schmidt
Projektmanager Site Assessment

Grevenbroich, 2024-08-26

www.windtest-nrw.de

Dieser Bericht darf auszugsweise nur mit schriftlicher Zustimmung der windtest grevenbroich gmbh vervielfältigt werden. Er umfasst insgesamt 28 Seiten inkl. der Anlagen.

Inhaltsverzeichnis

1 Einleitung 4

2 Beurteilungsverfahren 5

2.1 Maximale Schattenwurfbelastung 6

2.2 Meteorologisch wahrscheinliche Schattenwurfbelastung 6

2.3 Standortbeschreibung 7

2.4 Beschreibung der Immissionspunkte 7

2.5 Beschreibung der Emissionsquellen 9

3 Ergebnisse 10

4 Zusammenfassung 12

5 Anhang 13

5.1 Literaturverzeichnis 13

5.2 Bearbeitungsverlauf 13

5.3 Ergebnisse der Vorbelastung 14

5.4 Ergebnisse der Zusatzbelastung 17

5.5 Ergebnisse der Zusatz- / Gesamtbelastung 23

BImSchG-Genehmigung erteilt unter
Hinweis auf den vorgehefteten Bescne
Nebenbestimmungen sind dem Bescheid

ImG 03 / 2024

zu entnehmen. Die Prüfbemerkungen
sind bei Errichtung / Betrieb der Anlage
zu beachten.

1 Einleitung

Die windtest grevenbroich gmbh (wtg) erhielt 2024-03-25 von der NeXtWind Windpark Beteiligung II GmbH & Co.KG den Auftrag zur Erstellung eines Gutachtens zur Ermittlung des zu erwartenden Schattenwurfs an relevanten Immissionspunkten (IP), verursacht durch neun Windenergieanlagen (WEA) am Standort Lamstedt.

Die Beurteilung fand gemäß der Beschlüsse des Länderausschusses für Immissionsschutz (LAI) [2] statt.

Die vom Auftraggeber gewählte Konfiguration für die geplanten WEA ist in Tabelle 1 aufgeführt.

Tabelle 1: Geplante WEA am Standort Lamstedt

Konfig.	Hersteller / WEA-Typ	Nabenhöhe [m]	Nennleistung [kW]	Rotordurchmesser [m]
1	1x ENERCON E-138 EP3 E3	160	4.260	138.3
	8x ENERCON E-175 EP5	132.5	6.000	175.0

In der Umgebung der geplanten WEA gibt es derzeit fünf weitere Anlagen, welche im Sinne des LAI [2] als Vorbelastung berücksichtigt werden müssen. Die geplanten Anlagen werden als Zusatzbelastung behandelt. Zusammen mit der Vorbelastung bilden alle WEA die zu betrachtende Gesamtbelastung.

Hinweis: Die Berechnungsergebnisse, die grafischen und tabellarischen Schattenwurfkalender je Immissionspunkt und je Windenergieanlage werden separat in einem pdf-Dokument verschickt.

2 Beurteilungsverfahren

Im Unterschied zu den üblichen Fällen des Schattenwurfs durch feststehende Gebäude kann der schnelle periodische Wechsel von Licht und Schatten durch die bewegten Rotorblätter zu einer Beeinträchtigung der menschlichen Wahrnehmung in seiner Umgebung führen. Durch den geringeren Anteil der Diffusstrahlung an der Globalstrahlung kann der Wechselschatten im Inneren von Gebäuden besonders störend sein. Der Schattenwurf von Windenergieanlagen ist abhängig von Sonnenstand, meteorologischen Daten wie Sonnenhäufigkeit, Windgeschwindigkeits- und Windrichtungsverteilung sowie der Lage und den geometrischen Abmessungen der WEA.

Der zu berücksichtigende Bereich der Schattenwurfgesamtbelastung umfasst gemäß [2] ausschließlich das Gebiet, in dem mindestens 20 % der Sonnenfläche durch das Rotorblatt verdeckt werden. Diese Größe wird in Abhängigkeit von der Rotorblattgeometrie ermittelt. Da die Blatttiefe nicht über das gesamte Rotorblatt konstant ist, sondern zur Rotorblattspitze hin abnimmt, ist ersatzweise ein rechteckiges Rotorblatt mit einer mittleren Blatttiefe zu ermitteln (siehe Gleichung 1).

BImSchG-Genehmigung erteilt unter
Hinweis auf den vorgehefteten Bescheid.
Nebenbestimmungen sind dem Bescheid
zu entnehmen. Die Prüfbemerkungen
sind bei der Errichtung
zu beachten.
ImG 03 / 2024

Mittlere Blatttiefe = 1/2 (max. Blatttiefe + min. Blatttiefe bei 0,9 × Rotorradius) [2] (Gl. 1)

Abbildung 1 veranschaulicht den Beschattungsbereich einer Beispiel-WEA mit einer Gesamthöhe von 140 m und einer Blatttiefe von 2 m. Immissionspunkte außerhalb des Beschattungsbereichs sind für die Schattenwurfberechnung irrelevant.

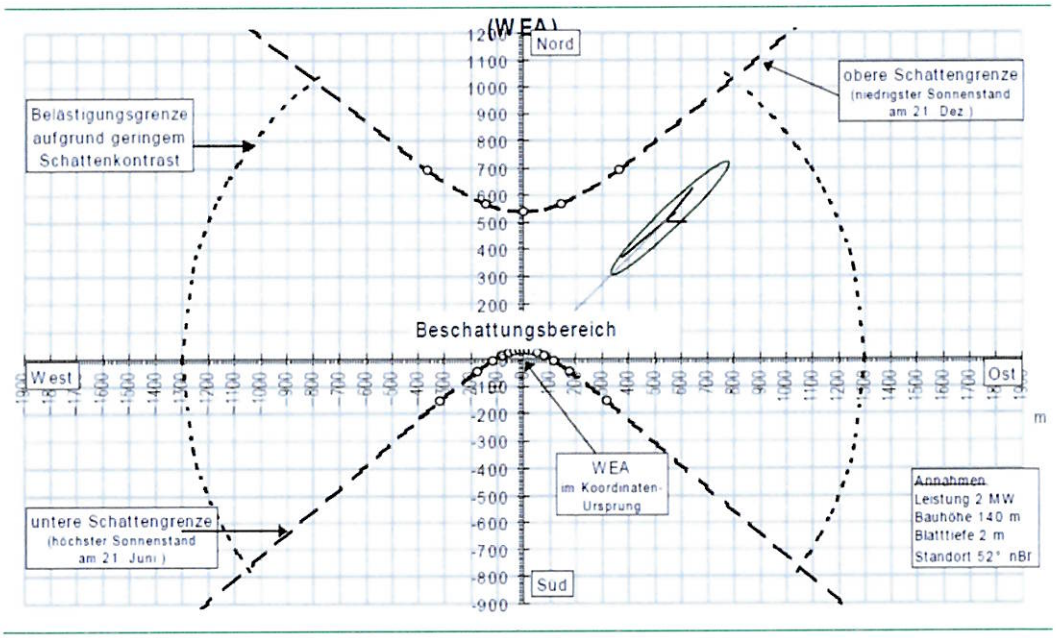


Abbildung 1: Möglicher Beschattungsbereich einer Beispiel-WEA [2]

Darüber hinaus hat der LAI [2] Richtwerte festgelegt, die bis zu einer offiziellen Richtlinie als Empfehlungswerte verwendet werden sollen. Diese werden in der gegenständlichen Betrachtung angewendet. Gemäß [2] sind **30 min Schatten/Tag** und **30 Stunden Gesamtschattenwurf/Jahr** als Richtwerte zugrunde gelegt. Diese Richtwerte entsprechen unter wahrscheinlichen Bedingungen **8 Stunden Schatten/Jahr**.

Durch die Unvorhersagbarkeit der meteorologischen Verhältnisse handelt es sich bei Schattenwurfberechnungen immer um vereinfachende Simulationen. Die Bewertung des Schattenwurfs erfolgt mittels der in Kapitel 2.1 und 2.2 dargestellten Beurteilungsverfahren.

2.1 Maximale Schattenwurfbelastung

Zur Übersicht über die maximalen Schattenwurfimmissionen (worst-case) in der Umgebung der WEA werden Linien gleicher maximaler Immissionen (Isolinien o. Isoflächen) berechnet. Die Berechnungen basieren auf horizontalen Rezeptoren. Die Isolinien werden für eine Referenzhöhe (hier 2 m über Grund) berechnet und die Ergebnisse werden als maximale Schattenwurfimmissionen in Stunden pro Jahr bzw. Stunden pro Tag tabellarisch dargestellt. Dabei basiert die Berechnung auf folgenden Annahmen:

- die Sonne ist als punktförmige Lichtquelle anzunehmen und scheint während der gesamten Zeit zwischen Sonnenauf- und Sonnenuntergang durchgehend (wolkenloser Himmel) an allen Tagen des Jahres,
- die Windrichtung wird stets so angenommen, dass die Rotorfläche senkrecht zur Sonneneinstrahlung steht (maximaler Schatten),
- die WEA ist während der gesamten Zeit in Betrieb (100 % Verfügbarkeit),
- es existieren keine Stillstandszeiten der WEA, es wird somit von durchgehend ausreichend starkem Wind ausgegangen,
- es befinden sich keine sichtverstellenden Hindernisse zwischen IP und WEA (z. B. Wald),
- die horizontalen Schattenwurfrezeptoren befinden sich in einer Bezugshöhe von 2 m, haben eine Größe von 0,1 m x 0,1 m und sind in 360°-Richtung (Gewächshaus / Terrassenfläche) ausgerichtet - daher punktförmig anzusehen.
- Zeiten, in denen die Sonne weniger als 3° über dem Horizont steht, werden wegen zu geringer Strahlungsintensität (Strahlungsdichte kleiner ca. 120 W/m² bzw. Beleuchtungsintensität kleiner 389 lx) nicht betrachtet.

In der Realität wird dieser worst-case in seinen gesamten Ausmaßen nie auftreten. Bei möglichen Überschreitungen der Richtwerte wird empfohlen, die real auftretenden Schattenwurfzeiten zu berücksichtigen (Tabelle 4, rechte Spalte). Sollte dies nicht möglich sein, können zwei unterschiedliche Vorgehensweisen angewendet werden:

- die geplanten WEA können durch den prognostizierten Schattenwurfbeginn und das prognostizierte Schattenwurfende für einzelne Schattenwurfintervalle abgeschaltet werden. Nachteil: die WEA würden auch abgeschaltet werden, wenn kein Schattenwurf möglich ist (z. B. bewölkter Himmel),
- durch die Implementierung von Schattenwurfmodulen, so genannten Abschaltmodulen, in die WEA Steuerung, werden die WEA bei auftretenden Immissionen abgeschaltet. Vorteil: die Ertragseinbußen durch Abschaltung der WEA werden geringgehalten.

2.2 Meteorologisch wahrscheinliche Schattenwurfbelastung

Zusätzlich zur Berechnung der maximalen Schattenwurfimmissionen erfolgt ebenfalls die Berechnung der meteorologisch wahrscheinlichen Schattenwurfimmissionen. Die Größe und die Lage der Rezeptoren werden analog zur worst-case Berechnung definiert. Unter Berücksichtigung der mittleren Sonnenscheindauer pro Monat, der Windrichtungsverteilung am Standort, sowie den voraussichtlichen Betriebsstunden der WEA wird die wahrscheinliche Schattenwurfimmission an den gewählten IP ausgegeben.

Als mittlere Sonnenscheindauer pro Monat werden die Werte der in windPRO [3] hinterlegten Daten des World Radiation Data Center (WRDC) der Klimastation Hamburg (Datengrundlage 1969 - 1993; ca. 60 km östlich des Standorts gelegen) für den Standort Lamstedt repräsentativ übernommen.

Die Betriebsstunden der geplanten WEA werden unter Zuhilfenahme der Leistungskennlinien (E-138: D1018685_4.0_de, E-175: D02772017_2.0_de) und der in [3] hinterlegten DWD Windstatistiken Bremervörde berechnet (ca. 17 km südsüdöstlich). Ferner wird für die jeweiligen WEA eine technische Verfügbarkeit von 100 % angenommen.

2.3 Standortbeschreibung

Der WEA Standort Lamstedt befindet sich im Bundesland Niedersachsen. Die Stadt Bremerhaven befindet sich 32 km südwestlich des Standortes.

Die Umgebung der Standorte besteht aus flachen, landwirtschaftlich genutzten Flächen mit mehreren kleineren Waldflächen. Die Umgebung ist im Umkreis von mehreren Kilometern relativ schwach besiedelt, vorwiegend in Form von Dörfern und Ortschaften, vereinzelten Häusern und Gehöften. Umrundet wird der Standort von den Ortschaften Mittelstnahe, Lamstedt und Armstorf.

Das Areal der geplanten WEA und der umliegenden Immissionspunkte ist auf einer geodätischen Höhe von etwa 5 m bis 26 m ü. NHN gelegen.

Zur Beurteilung des Standortes fand 2024-07-23 eine Besichtigung durch einen Mitarbeiter der wtg statt. Alle bestimmten IP sind im Anhang auf einem Auszug der topographischen Karte der Umgebung dargestellt. Eine detaillierte Beschreibung der relevanten Immissionspunkte folgt im nächsten Kapitel.

Anmerkung 1: Das in der vorliegenden Prognose genutzte Geländemodell basiert auf den im Geoportal Niedersachsen hinterlegten topographischen Karten im Maßstab 1:25.000 (DTK25) sowie den unter den ebenso abrufbaren digitalen Höhenlinien (DGM 5), welche kostenfrei zur Verfügung stehen (Open Data). In einem für die Prognose ausreichend großen Umkreis werden diese Karten in windPRO [3] am Standort mittels eines Web Map Service (WMS) eingeladen und anschließend für das relevante Areal angepasst.

Anmerkung 2: Aufgrund der großen Anzahl werden die Fotos der einzelnen IP nicht im Anhang dargestellt. Die Fotos können jedoch auf Anfrage bereitgestellt werden.

2.4 Beschreibung der Immissionspunkte

Als Immissionspunkte wurden die maßgeblichen Wohnbebauungen in verschiedenen Himmelsrichtungen ausgewählt, an denen eine Richtwertüberschreitung durch den Betrieb der WEA am ehesten zu erwarten ist.

Aufgrund dessen sowie der Ortsbesichtigung 2024-07-23 (vergl. Kapitel 2.3) wurden insgesamt 37 IP festgelegt. Deren Bezeichnung und Lage sind in Tabelle 2 sowie auf einem Ausschnitt der topografischen Karte im Anhang dargestellt.

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid
ImG 03 / 2024
zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

Tabelle 2: Angaben zu den Immissionspunkten

Nr.	Bezeichnung des IP	Koordinatensystem: UTM ETRS89 Zone 32	
		RW [m]	HW [m]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281

Fortsetzung Tabelle 2

Nr.	Bezeichnung des IP	Koordinatensystem: UTM ETRS89 Zone 32	
		RW [m]	HW [m]
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880

2.5 Beschreibung der Emissionsquellen

Die in dieser Prognose berücksichtigten WEA besitzen die in Tabelle 3 aufgelisteten geometrischen Abmessungen und maximalen Beschattungsbereiche (vgl. Abbildung 1). Die Angaben der Rotorblattgeometrie sind der Berechnungssoftware windPRO (Version 4.0.547) der Fa. EMD International A/S entnommen.

Tabelle 3: Angaben der Vor- und Zusatzbelastung

Bezeichnung	WEA-Typ	NH [m]	Rottorblattgeometrie			Beschattungsbereich	Koordinatensystem: UTM ETRS89 Zone 32	
			RD [m]	MBt [m]	Bt90 [m]	[m]	Rechtswert [m]	Hochwert [m]
WEA01	E-138 EP3 E3	160,0	138,3	3,93	1,04	1.686	502.184	5.941.963
WEA02	E-175 EP5	132,5	175	4,01	1,11	1.739	502.734	5.942.224
WEA03							503.091	5.942.569
WEA04							503.576	5.942.681
WEA05							504.117	5.942.884
WEA06							504.540	5.943.220
WEA07							502.739	5.941.776
WEA08							503.226	5.941.962
WEA09							503.899	5.942.394
Vorbelastung								
WEA10	E-70 E4	132,5	71	3,54	1,29	1.640	502.407	5.942.842
WEA11							502.853	5.942.821
WEA12							502.153	5.942.521
WEA13							502.556	5.942.520
WEA14							502.117	5.942.205

NH: Nabenhöhe, RD: Rotordurchmesser, MBt: maximale Blatttiefe, Bt-90: Blatttiefe bei 90 % Radius

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid

ImG 03 / 2024

zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

3 Ergebnisse

In Tabelle 4 sind Berechnungsergebnisse für die Vor-, Zusatz- und Gesamtbelastung (VB/ZB/GB) des Standortes Lamstedt dargestellt. Der Anlagentyp, Nabenhöhe und Standortkoordinaten sowie die zu Grunde liegenden Rotorblattgeometrien der berücksichtigten WEA sind in Tabelle 1 und Tabelle 3 aufgelistet.

Tabelle 4: Prognoseergebnisse je IP der Vor-, Zusatz- und Gesamtbelastung

Nr.	Maximale Schattenwurfbelastung [h/Jahr]			Maximale Schattenwurfbelastung [h/Tag]			Wahrscheinliche Schattenwurfbelastung [h/Jahr]		
	VB	ZB	GB	VB	ZB	GB	VB	ZB	GB
IP01	8:10	0:00	8:10	0:13	0:00	0:13	0:52	0:00	0:51
IP02	0:00	**37:42**	**37:42**	0:00	**0:31**	**0:31**	0:00	4:02	4:04
IP03	0:00	**135:35**	**135:35**	0:00	**2:00**	**2:00**	0:00	**13:33**	**13:38**
IP04	0:00	**67:14**	**67:14**	0:00	**0:46**	**0:46**	0:00	**13:57**	**14:02**
IP05	0:00	23:46	23:46	0:00	**0:31**	**0:31**	0:00	5:33	5:35
IP06	0:00	24:57	24:57	0:00	0:29	0:29	0:00	5:37	5:39
IP07	2:37	**169:04**	**171:14**	0:11	**1:48**	**1:48**	0:39	**38:08**	**38:55**
IP08	11:02	**193:05**	**204:07**	0:16	**2:20**	**2:20**	1:33	**21:32**	**23:12**
IP09	**31:02**	**35:32**	**52:47**	0:24	0:30	**0:50**	3:21	3:43	5:44
IP10	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
IP11	0:00	**81:33**	**81:33**	0:00	**0:54**	**0:54**	0:00	**17:29**	**17:35**
IP12	0:00	**118:36**	**118:36**	0:00	**1:01**	**1:01**	0:00	**26:41**	**26:51**
IP13	0:00	**92:54**	**92:54**	0:00	**0:54**	**0:54**	0:00	**20:50**	**20:57**
IP14	0:00	**52:42**	**52:42**	0:00	**0:43**	**0:43**	0:00	**11:17**	**11:21**
IP15	0:00	**34:20**	**34:20**	0:00	**0:37**	**0:37**	0:00	7:42	7:45
IP16	0:00	12:20	12:20	0:00	0:29	0:29	0:00	2:11	2:12
IP17	0:00	23:42	23:42	0:00	**0:31**	**0:31**	0:00	5:21	5:23
IP18	0:00	**59:35**	**59:35**	0:00	**0:36**	**0:36**	0:00	**13:32**	**13:37**
IP19	0:00	**49:38**	**49:38**	0:00	**0:34**	**0:34**	0:00	**11:32**	**11:36**
IP20	0:00	**45:48**	**45:48**	0:00	**0:32**	**0:32**	0:00	**10:40**	**10:44**
IP21	0:00	**36:54**	**36:54**	0:00	**0:31**	**0:31**	0:00	**8:27**	**8:30**
IP22	0:00	**34:08**	**34:08**	0:00	0:27	0:27	0:00	7:36	7:39
IP23	0:00	**34:38**	**34:38**	0:00	**0:32**	**0:32**	0:00	7:54	7:57
IP24	0:00	29:22	29:22	0:00	0:30	0:30	0:00	6:43	6:45
IP25	0:00	**33:30**	**33:30**	0:00	**0:31**	**0:31**	0:00	7:39	7:42
IP26	0:00	27:42	27:42	0:00	0:28	0:28	0:00	6:20	6:23

Fortsetzung Tabelle 4

Nr.	Maximale Schattenwurfbelastung [h/Jahr]			Maximale Schattenwurfbelastung [h/Tag]			Wahrscheinliche Schattenwurfbelastung [h/Jahr]		
	VB	ZB	GB	VB	ZB	GB	VB	ZB	GB
IP27	0:00	26:45	26:45	0:00	0:28	0:28	0:00	6:01	6:03
IP28	0:00	24:34	24:34	0:00	0:30	0:30	0:00	5:33	5:35
IP29	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
IP30	0:00	5:37	5:37	0:00	0:14	0:14	0:00	1:14	1:15
IP31	0:00	24:00	24:00	0:00	0:26	0:26	0:00	5:29	5:31
IP32	0:00	**236:45**	**236:45**	0:00	**1:55**	**1:55**	0:00	**54:56**	**55:16**
IP33	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00	0:00
IP34	12:23	0:00	12:23	0:14	0:00	0:14	1:26	0:00	1:25
IP35	0:00	9:32	9:32	0:00	0:21	0:21	0:00	0:47	0:48
IP36	11:49	**151:23**	**163:12**	0:16	**2:07**	**2:07**	1:34	**16:37**	**18:17**
IP37	0:00	**119:51**	**119:51**	0:00	**1:52**	**1:52**	0:00	**11:50**	**11:55**

Hinweis: Bei Betrachtung der wahrscheinlichen Schattenwurfzeiten können zwischen Vor- und Gesamt- sowie zwischen Zusatz- und Gesamtbelastung voneinander abweichende Schattenwurfzeiten auftreten. Dies ist auf die unterschiedliche Betriebsdauer je WEA und Sektor zurückzuführen, da die Berechnungssoftware windPRO [3] eine mittlere Betriebsdauer für alle berücksichtigten WEA verwendet. Weiterhin wird gleichzeitig auftretender Schattenwurf, verursacht durch Vor- und Zusatzbelastung, in der Gesamtbelastung nur einfach gewertet.

Durch die **Vorbelastung** wird an **einem** Immissionspunkt (IP 09) der Richtwert von 30 Stunden Gesamtschattenwurf im Jahr, bzw. keinem Immissionspunkten der Richtwert von 30 Minuten Schattenwurf am Tag (worst-case) überschritten. Der Richtwert von 8 Stunden Gesamtschattenwurf der wahrscheinlichen Schattenwurfbelastung im Jahr (Sonnenwahrscheinlichkeit, real) wird durch die Vorbelastung an keinem Immissionspunkt überschritten.

Durch die **Zusatzbelastung** wird an **21** Immissionspunkten (IP02 - IP04, IP07 - IP09, IP11 - IP15, IP18 - IP23, IP25, IP32, IP36 und IP37) der Richtwert von 30 Stunden Gesamtschattenwurf im Jahr, bzw. an **21** Immissionspunkten (IP02 - IP05, IP07, IP08, IP11 - IP15, IP17 - IP21, IP23, IP25, IP32, IP36 und IP37) der Richtwert von 30 Minuten Schattenwurf am Tag (worst-case) überschritten. Der Richtwert von 8 Stunden Gesamtschattenwurf der wahrscheinlichen Schattenwurfbelastung im Jahr (Sonnenwahrscheinlichkeit, real) wird durch die Zusatzbelastung an **15** Immissionspunkten (IP03, IP04, IP07, IP08, IP11 - IP14, IP18 - IP21, IP32, IP36 und IP37) überschritten.

Durch die **Gesamtbelastung** wird an insgesamt **21** Immissionspunkten (IP02 - IP04, IP07 - IP09, IP11 - IP15, IP18 - IP23, IP25, IP32, IP36 und IP37) der Richtwert von 30 Stunden Gesamtschattenwurf im Jahr, bzw. an **22** Immissionspunkten (IP02 - IP05, IP07 - IP09, IP11 - IP15, IP17 - IP21, IP23, IP25, IP32, IP36 und IP37) der Richtwert von 30 Minuten Schattenwurf am Tag (worst-case) überschritten. Der Richtwert von 8 Stunden Gesamtschattenwurf der wahrscheinlichen Schattenwurfbelastung im Jahr (Sonnenwahrscheinlichkeit, real) wird durch die Gesamtbelastung an **15** Immissionspunkten (IP03, IP04, IP07, IP08, IP11 - IP14, IP18 - IP21, IP32, IP36 und IP37) überschritten.

Bimschg-Genehmigung erteilt unter Berücksichtigung der vorgehefteten bestätigt. Nebenbestimmungen siehe Seite
IP8 03/2024
Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu entnehmen. zu beachten.

4 Zusammenfassung

Die wtg erhielt 2024-03-25 von der NeXtWind Windpark Beteiligung II GmbH & Co.KG den Auftrag zur Erstellung eines Gutachtens zur Ermittlung des zu erwartenden Schattenwurfs an relevanten IP, verursacht durch eine WEA des Typs E-138 EP3 E3 sowie 8 WEA des Typs E-175 EP5 am Standort Lamstedt.

Zur Beurteilung des Standortes fand 2024-07-23 eine Besichtigung des Standortes durch die wtg statt. Aufgrund der Ortsbesichtigungen wurden insgesamt 37 IP festgelegt.

Es wurden mehrere Berechnungen der Schattenwurfimmissionen in der Umgebung des geplanten WEA-Standortes Lamstedt durchgeführt. Dabei wurde Folgendes berechnet:

- maximale (worst-case) und wahrscheinliche (reale) Schattenwurfimmissionen an 37 ausgewählten und relevanten IP für die Vor-, Zusatz- und Gesamtbelastung.
- Isolinien-Darstellung der worst-case Schattenwurfbelastung in Stunden/Jahr und Minuten pro Jahr sowie die Sonnenwahrscheinliche Schattenwurfbelastung in Stunden/Jahr für die Zusatz- und Gesamtbelastung.

Die durchgeführten Schattenwurfberechnungen gelten nur für den Standort Lamstedt mit der in Kapitel 2.5 beschriebenen Konfiguration und dem bei der Standortbesichtigung vorgefundenen Zustand der Umgebung (Anzahl und Lage der IP). Eine Ergebnisdarstellung erfolgt im Anhang.

In der Gesamtbelastung treten, bei Berücksichtigung der maximal möglichen Sonnenscheindauer (worst case) Richtwertüberschreitungen an den IP02 - IP04, IP07 - IP09, IP11 - IP15, IP18 - IP23, IP25, IP32, IP36 und IP37 auf. Unter Berücksichtigung der realen Sonnenwahrscheinlichkeit wird der Richtwert für den Jahreswert an den IP03, IP04, IP07, IP08, IP11 - IP14, IP18 - IP21, IP32, IP36 und IP37 überschritten.

Die theoretischen Überschreitungen der Richtwerte an den betroffenen Immissionspunkten können durch die Implementierung von Schattenwurfmodulen in die WEA Steuerung vermieden werden (siehe Kapitel 2.1 letzter Abschnitt).

Der vorliegende Bericht wurde sorgfältig und fachgerecht nach bestem Wissen und Gewissen, unparteiisch und nach allgemeinen Regeln der Technik angefertigt.

5 Anhang

5.1 Literaturverzeichnis

[1] Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz, Planung und Genehmigung von Windenergieanlagen an Land in Niedersachsen (Windenergieerlass), 2021-09-02

[2] 109. Sitzung des Länderausschuss für Immissionsschutz (LAI): Hinweise zur Ermittlung und Beurteilung der optischen Immissionen von WEA, Stand 2020-01-23.

[3] windPRO (Version 4.0.547), 2024, EMD International A/S,

[4] Open Geodata, Landesamt für Geoinformation und Landesvermessung Niedersachsen (LGLN), LGLN (2024) Creative Commons Namensnennung – 4.0 International (CC BY 4.0)

[5] Palz, W.; Greif, J.: European Solar Radiation Atlas – Solar Radiation on horizontal and inclined surfaces. Springer Berlin Heidelberg New York, 1996.

[6] Vierte Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes (Verordnung über genehmigungsbedürftige Anlagen - 4. BImSchV), 2021-01.

5.2 Bearbeitungsverlauf

Fassung	*Datum*	*Inhalt*
SW24020B1	2024-08-26	Ermittlung der optischen Immissionen für den Windenergieanlagenstandort Lamstedt

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid ImG 03 / 2024 zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

5.3 Ergebnisse der Vorbelastung

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

Annahmen für Schattenwurfberechnung

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

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

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

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

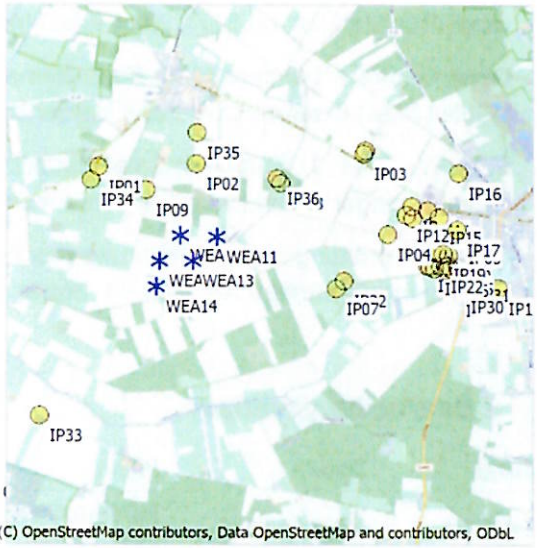
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



Maßstab 1:75.000
Existierende WEA
Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotor-durch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA10	502.407	5.942.842	11,5	E-70 E4 (M2)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA11	502.853	5.942.821	15,0	E-70 E4 (M3)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA12	502.153	5.942.521	10,0	E-70 E4 (M5)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA13	502.556	5.942.520	13,2	E-70 E4 (M6)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA14	502.117	5.942.205	10,0	E-70 E4 (M8)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	met. wahrsch. Beschattungsdauer Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
IP01	Sticht 1, 21770 Mittelstenahe	8:10	60	0:13	0:52
IP02	Neues Moor 21, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	0:00	0	0:00	0:00
IP04	Wischhofstraße 10, 21769 Lamstedt	0:00	0	0:00	0:00
IP05	Am Kamp 26, 21769 Lamstedt	0:00	0	0:00	0:00
IP06	Strother Heuweg 5, 21769 Lamstedt	0:00	0	0:00	0:00
IP07	Driftweg 2, 21769 Lamstedt	2:37	19	0:11	0:39
IP08	Haneworth 1, 21770 Lamstedt	11:02	58	0:16	1:33
IP09	Sticht 5, 21770 Mittelstenahe	31:02	114	0:24	3:21
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	0:00	0	0:00	0:00
IP12	Auf dem Kampen 6, 21769 Lamstedt	0:00	0	0:00	0:00
IP13	Auf dem Kampen 5, 21769 Lamstedt	0:00	0	0:00	0:00
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	0:00	0	0:00	0:00
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP16	Kleiner Köven 15A, 21769 Lamstedt	0:00	0	0:00	0:00
IP17	An der Gösche 10, 21769 Lamstedt	0:00	0	0:00	0:00
IP18	Wischhofstraße 17a, 21769 Lamstedt	0:00	0	0:00	0:00
IP19	Wischhofstraße 15, 21769 Lamstedt	0:00	0	0:00	0:00
IP20	Wischhofstraße 13, 21769 Lamstedt	0:00	0	0:00	0:00
IP21	Auf der Stroth 18, 21769 Lamstedt	0:00	0	0:00	0:00
IP22	Auf der Stroth 24, 21769 Lamstedt	0:00	0	0:00	0:00
IP23	Auf der Stroth 20, 21769 Lamstedt	0:00	0	0:00	0:00
IP24	Auf der Stroth 23, 21769 Lamstedt	0:00	0	0:00	0:00
IP25	Auf der Stroth 21, 21769 Lamstedt	0:00	0	0:00	0:00
IP26	Auf der Stroth 25, 21769 Lamstedt	0:00	0	0:00	0:00
IP27	Strother Heuweg 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP28	Strother Heuweg 9, 21769 Lamstedt	0:00	0	0:00	0:00
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	0:00	0	0:00	0:00
IP31	Jochensweg 8, 21769 Lamstedt	0:00	0	0:00	0:00
IP32	Driftweg 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	12:23	77	0:14	1:26
IP35	Neues Moor 19, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP36	Haneworth 2, 21770 Lamstedt	11:49	62	0:16	1:34
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	0:00	0	0:00	0:00

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.
Im 0 3 / 2 0 2 4

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA10	E-70 E4 (M2)	26:40	3:25
WEA11	E-70 E4 (M3)	19:16	2:56
WEA12	E-70 E4 (M5)	7:38	0:43
WEA13	E-70 E4 (M6)	25:16	2:33
WEA14	E-70 E4 (M8)	0:00	0:00

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

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

5.4 Ergebnisse der Zusatzbelastung

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Zusatzbelastung

Annahmen für Schattenwurfberechnung

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

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

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

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

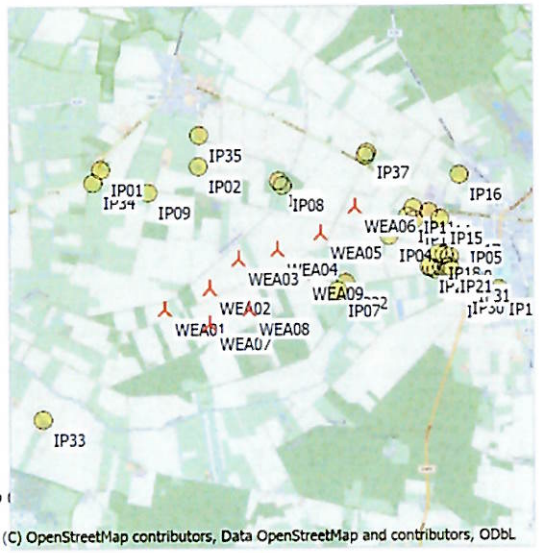
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo (
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



Maßstab 1:75.000
Neue WEA
Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotordurch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA01	502.184	5.941.963	10,0	E-138 EP3 E3	Ja	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	160,0	1.686	11,1
WEA02	502.734	5.942.224	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA03	503.091	5.942.569	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA04	503.576	5.942.681	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA05	504.117	5.942.884	16,1	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA06	504.540	5.943.220	19,4	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA07	502.739	5.941.776	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA08	503.226	5.941.962	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA09	503.899	5.942.394	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Bimschg-Genehmigung erteilt. Die
hierbei festgelegten Auflagen sind dem Gutachten
zu entnehmen. Die Prüfbemerkungen
sind bei Errichtung / Betrieb der Anlage
zu beachten.
IMG 03 / 2024

Projekt
SW24020 Lamstedt

Lizenzierter Anwender
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet
22.08.2024 15:28/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	met. wahrsch. Beschattungsdauer Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
IP01	Sticht 1, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP02	Neues Moor 21, 21770 Mittelstenahe	37:42	114	0:31	4:02
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	135:35	87	2:00	13:33
IP04	Wischhofstraße 10, 21769 Lamstedt	67:14	135	0:46	13:57
IP05	Am Kamp 26, 21769 Lamstedt	23:46	75	0:31	5:33
IP06	Strother Heuweg 5, 21769 Lamstedt	24:57	95	0:29	5:37
IP07	Driftweg 2, 21769 Lamstedt	169:04	207	1:48	38:08
IP08	Haneworth 1, 21770 Lamstedt	193:05	167	2:20	21:32
IP09	Sticht 5, 21770 Mittelstenahe	35:32	94	0:30	3:43
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	81:33	155	0:54	17:29
IP12	Auf dem Kampen 6, 21769 Lamstedt	118:36	202	1:01	26:41
IP13	Auf dem Kampen 5, 21769 Lamstedt	92:54	174	0:54	20:50
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	52:42	126	0:43	11:17
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	34:20	85	0:37	7:42
IP16	Kleiner Köven 15A, 21769 Lamstedt	12:20	37	0:29	2:11
IP17	An der Gösche 10, 21769 Lamstedt	23:42	74	0:31	5:21
IP18	Wischhofstraße 17a, 21769 Lamstedt	59:35	146	0:36	13:32
IP19	Wischhofstraße 15, 21769 Lamstedt	49:38	119	0:34	11:32
IP20	Wischhofstraße 13, 21769 Lamstedt	45:48	120	0:32	10:40
IP21	Auf der Stroth 18, 21769 Lamstedt	36:54	101	0:31	8:27
IP22	Auf der Stroth 24, 21769 Lamstedt	34:08	117	0:27	7:36
IP23	Auf der Stroth 20, 21769 Lamstedt	34:38	96	0:32	7:54
IP24	Auf der Stroth 23, 21769 Lamstedt	29:22	92	0:30	6:43
IP25	Auf der Stroth 21, 21769 Lamstedt	33:30	98	0:31	7:39
IP26	Auf der Stroth 25, 21769 Lamstedt	27:42	90	0:28	6:20
IP27	Strother Heuweg 1, 21769 Lamstedt	26:45	104	0:28	6:01
IP28	Strother Heuweg 9, 21769 Lamstedt	24:34	81	0:30	5:33
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	5:37	36	0:14	1:14
IP31	Jochensweg 8, 21769 Lamstedt	24:00	70	0:26	5:29
IP32	Driftweg 1, 21769 Lamstedt	236:45	212	1:55	54:56
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	0:00	0	0:00	0:00

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP28	Strother Heuweg 9, 21769 Lamstedt	24:34	81	0:30	5:35
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	5:37	36	0:14	1:15
IP31	Jochensweg 8, 21769 Lamstedt	24:00	70	0:26	5:31
IP32	Driftweg 1, 21769 Lamstedt	236:45	212	1:55	55:16
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	12:23	77	0:14	1:25
IP35	Neues Moor 19, 21770 Mittelstenahe	9:32	34	0:21	0:48
IP36	Haneworth 2, 21770 Lamstedt	163:12	170	2:07	18:17
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	119:51	80	1:52	11:55

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA01	E-138 EP3 E3	0:00	0:00
WEA02	E-175 EP5	52:52	6:21
WEA03	E-175 EP5	94:33	14:07
WEA04	E-175 EP5	197:04	32:43
WEA05	E-175 EP5	229:01	35:43
WEA06	E-175 EP5	332:56	63:20
WEA07	E-175 EP5	7:47	1:23
WEA08	E-175 EP5	26:05	4:52
WEA09	E-175 EP5	252:03	57:20
WEA10	E-70 E4 (M2)	26:40	3:23
WEA11	E-70 E4 (M3)	19:16	2:54
WEA12	E-70 E4 (M5)	7:38	0:43
WEA13	E-70 E4 (M6)	25:16	2:32
WEA14	E-70 E4 (M8)	0:00	0:00

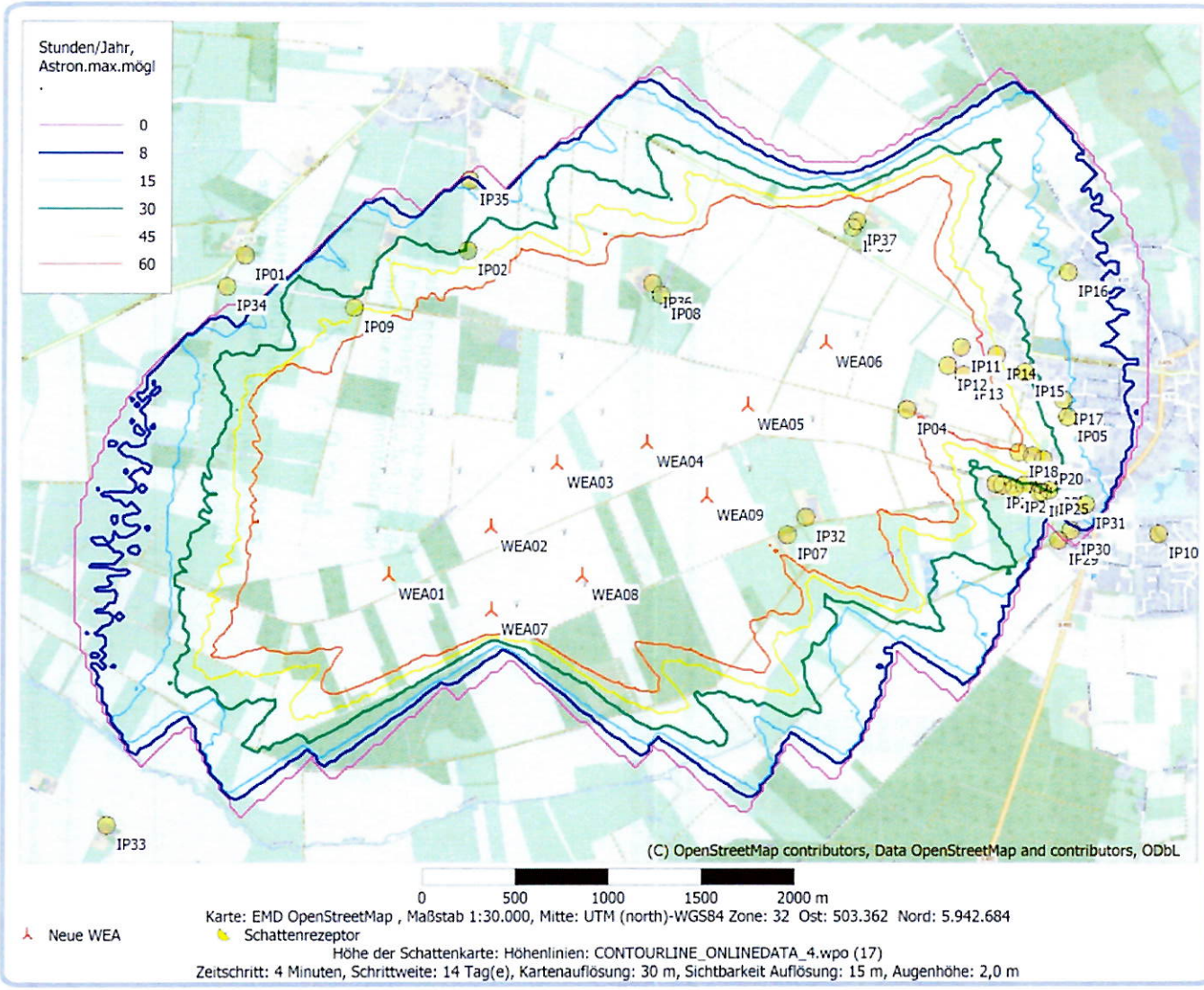
Summen in Rezeptortabelle und WEA-Tabelle können sich unterscheiden, da eine WEA gleichzeitig an zwei oder mehr Rezeptoren Beschattung verursachen kann und/oder ein Rezeptor gleichzeitig von zwei oder mehr WEA beschattet werden kann.

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

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid Nebenbestimmungen sind dem Bescheid

ImG 0 3 . 2 0 2 4

zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.



Projekt:
SW24020 Lamstedt

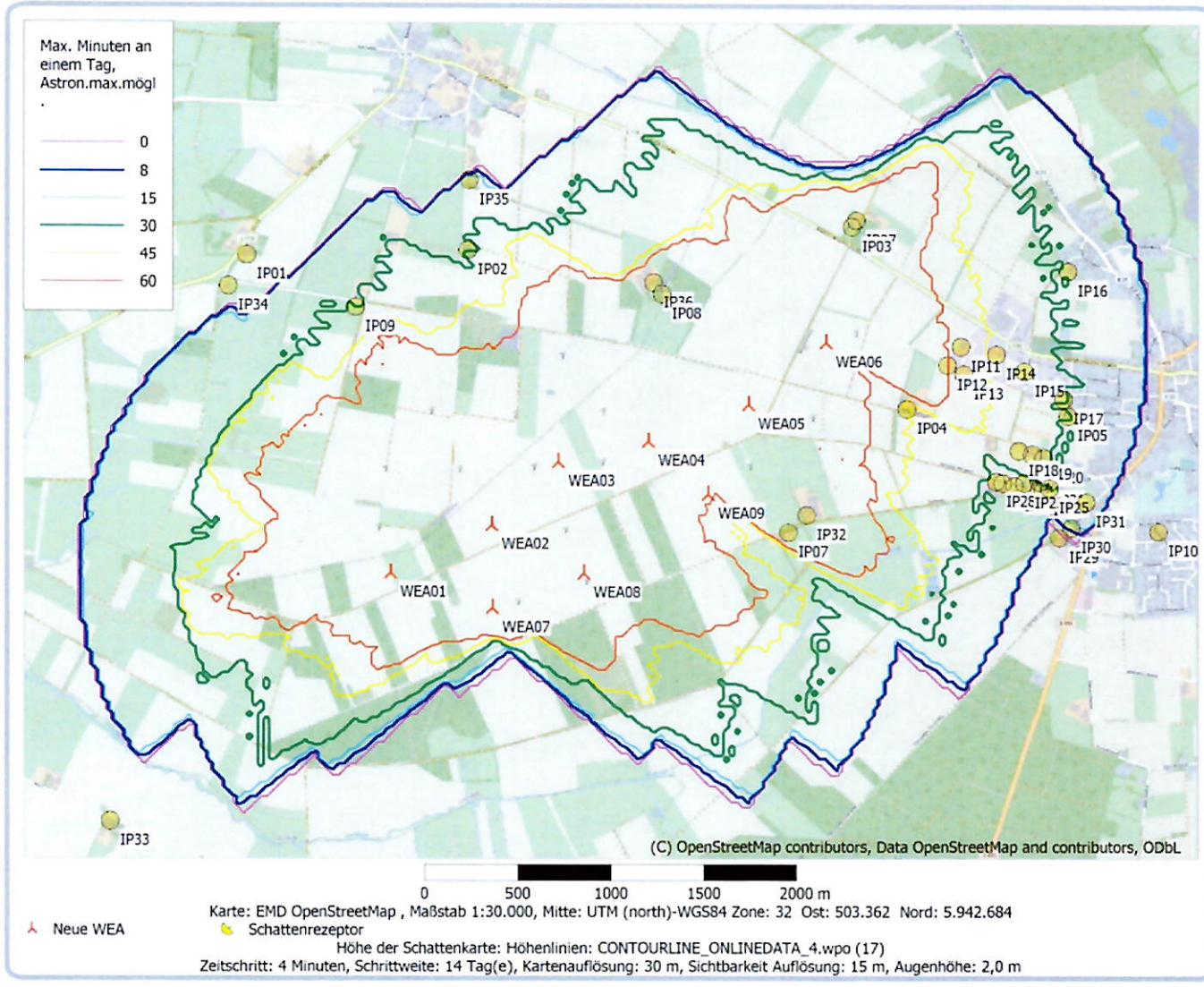
SHADOW - Karte

Berechnung:
SW24020 Lamstedt Zusatzbelastung, Kartendarstellung h/a

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt

Berechnet:
22.08.2024 15:41/4.0.540

windtest grevenbroich gmbh



Karte: EMD OpenStreetMap , Maßstab 1:30.000, Mitte: UTM (north)-WGS84 Zone: 32 Ost: 503.362 Nord: 5.942.684

Höhe der Schattenkarte: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo (17)

Zeitschritt: 4 Minuten, Schrittweite: 14 Tag(e), Kartenauflösung: 30 m, Sichtbarkeit Auflösung: 15 m, Augenhöhe: 2,0 m

Projekt:
SW24020 Lamstedt

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

ImG 07.2024

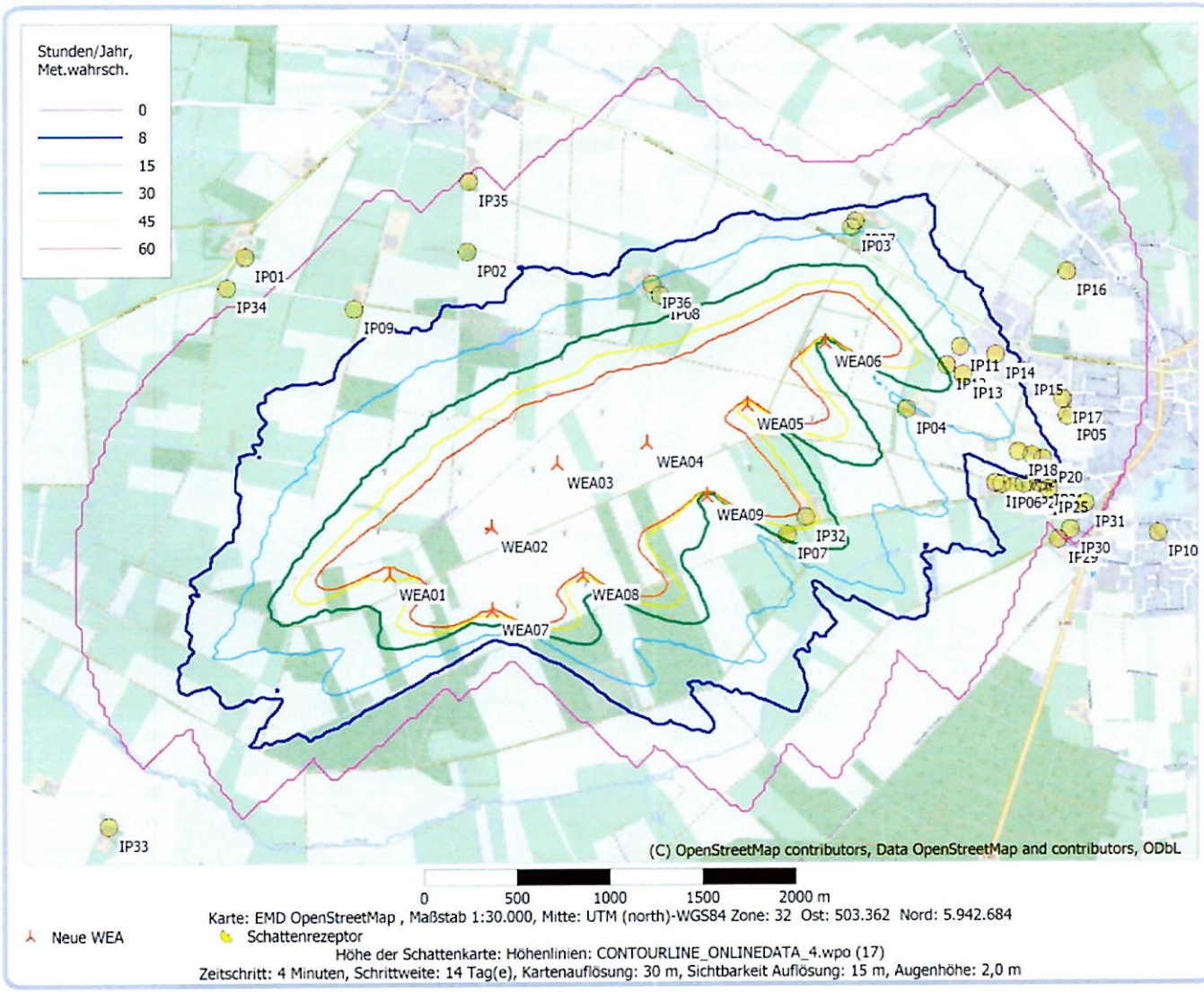
SHADOW - Karte

Berechnung:
SW24020 Lamstedt Zusatzbelastung, Kartendarstellung min/d

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt

Berechnet:
22.08.2024 15:39/4.0.540

windtest grevenbroich gmbh



Projekt:
SW24020 Lamstedt

SHADOW - Karte
Berechnung:

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:37/4.0.540

windtest grevenbroich gmbh

5.5 Ergebnisse der Zusatz- / Gesamtbelastung

Projekt:
SW24020 Lamstedt

BImSchG-Genehmigung erteilt unter
Hinweis auf den vorgehefteten
Nebenbestimmungen sind dem
ImG 03.2024

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...en. Die Prüfbemerkungen
sind bei Errichtung / Betrieb der Anlage
zu beachten.

Annahmen für Schattenwurfberechnung

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

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

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

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

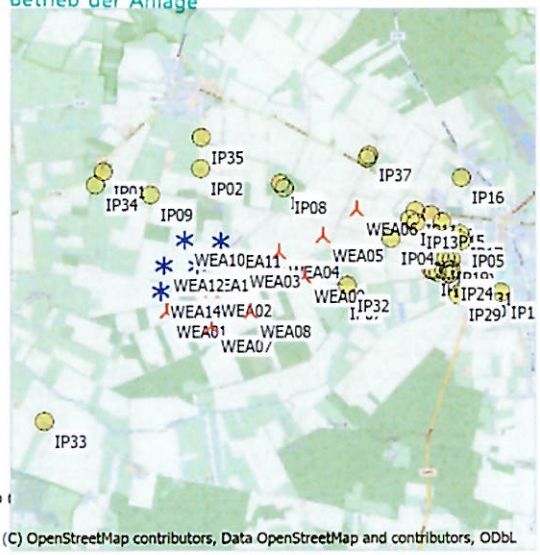
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



Maßstab 1:75.000
Neue WEA | Existierende WEA | Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotor-durch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA01	502.184	5.941.963	10,0	E-138 EP3 E3	Ja	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	160,0	1.686	11,1
WEA02	502.734	5.942.224	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA03	503.091	5.942.569	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA04	503.576	5.942.681	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA05	504.117	5.942.884	16,1	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA06	504.540	5.943.220	19,4	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA07	502.739	5.941.776	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA08	503.226	5.941.962	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA09	503.899	5.942.394	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA10	502.407	5.942.842	11,5	E-70 E4 (M2)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA11	502.853	5.942.821	15,0	E-70 E4 (M3)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA12	502.153	5.942.521	10,0	E-70 E4 (M5)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA13	502.556	5.942.520	13,2	E-70 E4 (M6)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA14	502.117	5.942.205	10,0	E-70 E4 (M8)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	met. wahrsch. Beschattungsdauer Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
IP01	Sticht 1, 21770 Mittelstenahe	8:10	60	0:13	0:51
IP02	Neues Moor 21, 21770 Mittelstenahe	37:42	114	0:31	4:04
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	135:35	87	2:00	13:38
IP04	Wischhofstraße 10, 21769 Lamstedt	67:14	135	0:46	14:02
IP05	Am Kamp 26, 21769 Lamstedt	23:46	75	0:31	5:35
IP06	Strother Heuweg 5, 21769 Lamstedt	24:57	95	0:29	5:39
IP07	Driftweg 2, 21769 Lamstedt	171:14	207	1:48	38:55
IP08	Haneworth 1, 21770 Lamstedt	204:07	181	2:20	23:12
IP09	Sticht 5, 21770 Mittelstenahe	52:47	120	0:50	5:44
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	81:33	155	0:54	17:35
IP12	Auf dem Kampen 6, 21769 Lamstedt	118:36	202	1:01	26:51
IP13	Auf dem Kampen 5, 21769 Lamstedt	92:54	174	0:54	20:57
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	52:42	126	0:43	11:21
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	34:20	85	0:37	7:45
IP16	Kleiner Köven 15A, 21769 Lamstedt	12:20	37	0:29	2:12
IP17	An der Gösche 10, 21769 Lamstedt	23:42	74	0:31	5:23
IP18	Wischhofstraße 17a, 21769 Lamstedt	59:35	146	0:36	13:37
IP19	Wischhofstraße 15, 21769 Lamstedt	49:38	119	0:34	11:36
IP20	Wischhofstraße 13, 21769 Lamstedt	45:48	120	0:32	10:44
IP21	Auf der Stroth 18, 21769 Lamstedt	36:54	101	0:31	8:30
IP22	Auf der Stroth 24, 21769 Lamstedt	34:08	117	0:27	7:39
IP23	Auf der Stroth 20, 21769 Lamstedt	34:38	96	0:32	7:57
IP24	Auf der Stroth 23, 21769 Lamstedt	29:22	92	0:30	6:45
IP25	Auf der Stroth 21, 21769 Lamstedt	33:30	98	0:31	7:42
IP26	Auf der Stroth 25, 21769 Lamstedt	27:42	90	0:28	6:23
IP27	Strother Heuweg 1, 21769 Lamstedt	26:45	104	0:28	6:03

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP28	Strother Heuweg 9, 21769 Lamstedt	24:34	81	0:30	5:35
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	5:37	36	0:14	1:15
IP31	Jochensweg 8, 21769 Lamstedt	24:00	70	0:26	5:31
IP32	Driftweg 1, 21769 Lamstedt	236:45	212	1:55	55:16
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	12:23	77	0:14	1:25
IP35	Neues Moor 19, 21770 Mittelstenahe	9:32	34	0:21	0:48
IP36	Haneworth 2, 21770 Lamstedt	163:12	170	2:07	18:17
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	119:51	80	1:52	11:55

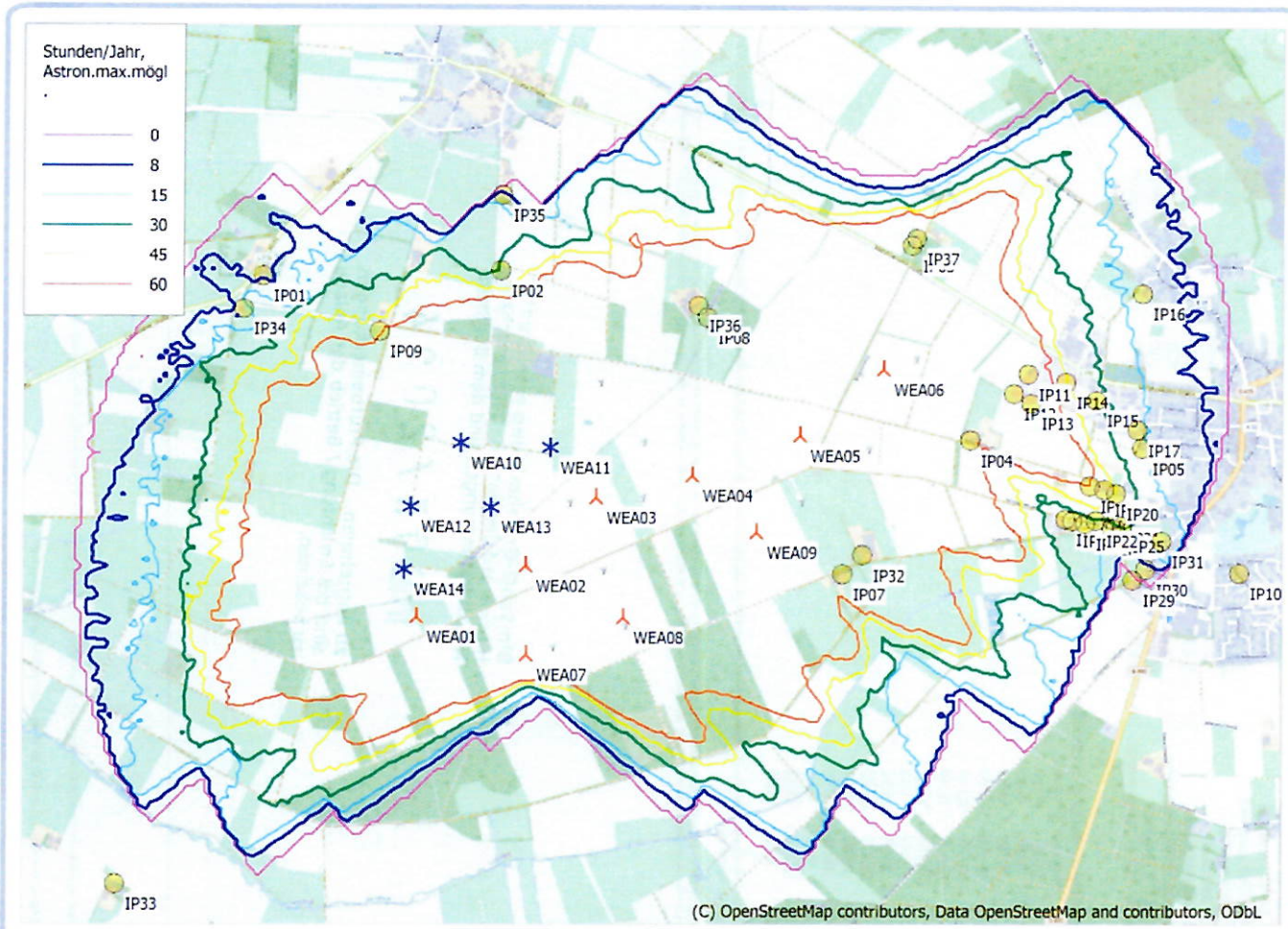
Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA01	E-138 EP3 E3	0:00	0:00
WEA02	E-175 EP5	52:52	6:21
WEA03	E-175 EP5	94:33	14:07
WEA04	E-175 EP5	197:04	32:43
WEA05	E-175 EP5	229:01	35:43
WEA06	E-175 EP5	332:56	63:20
WEA07	E-175 EP5	7:47	1:23
WEA08	E-175 EP5	26:05	4:52
WEA09	E-175 EP5	252:03	57:20
WEA10	E-70 E4 (M2)	26:40	3:23
WEA11	E-70 E4 (M3)	19:16	2:54
WEA12	E-70 E4 (M5)	7:38	0:43
WEA13	E-70 E4 (M6)	25:16	2:32
WEA14	E-70 E4 (M8)	0:00	0:00

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

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

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid ImG 03 / 2024 zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.



Projekt:
SW24020 Lamstedt

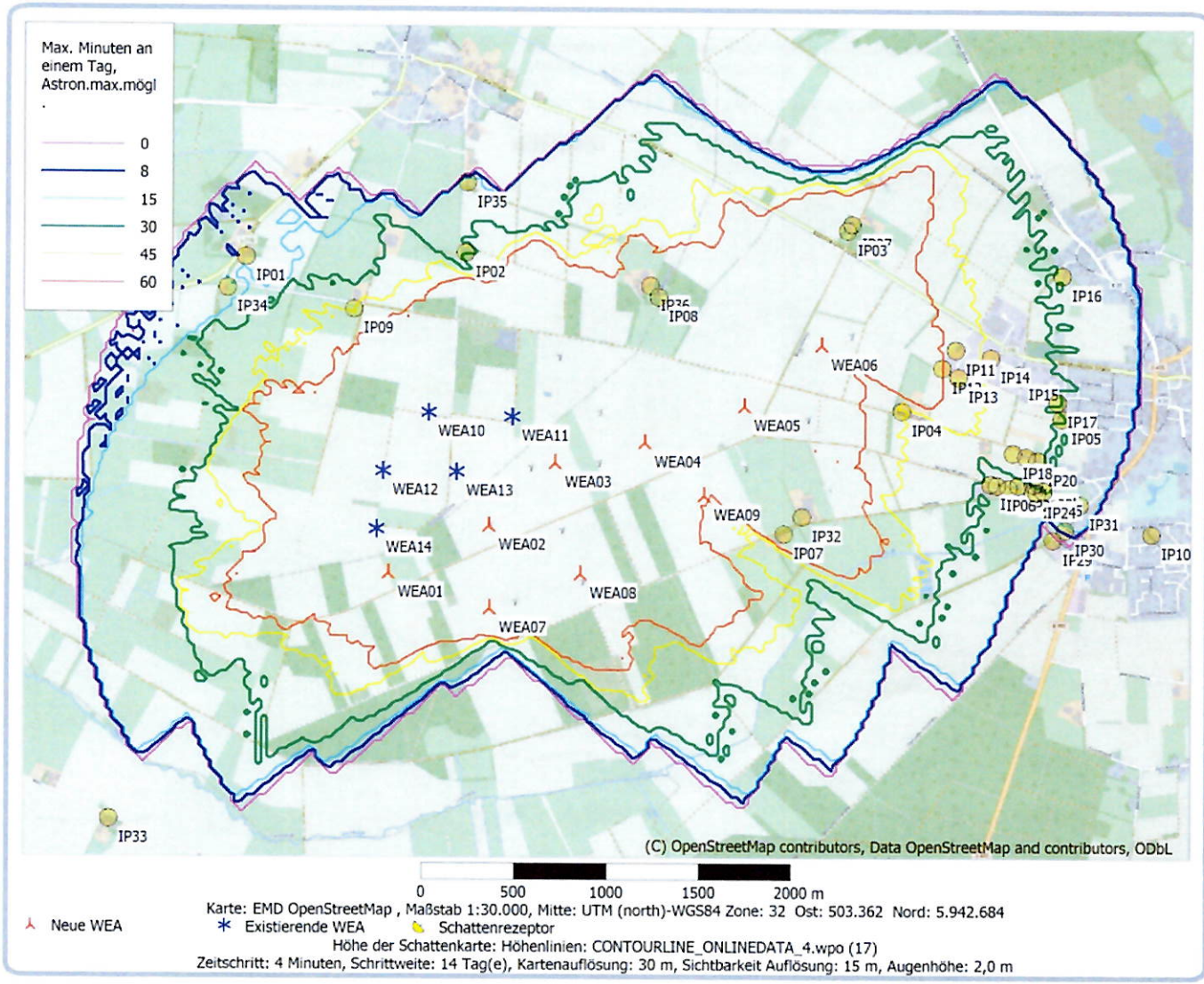
SHADOW - Karte

Berechnung:
SW24020 Lamstedt Gesamtbelastung, Kartendarstellung h/a

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt

Berechnet:
22.08.2024 15:35/4.0.540

windtest grevenbroich gmbh



Projekt:
SW24020 Lamstedt

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

ImG 03 / 2024

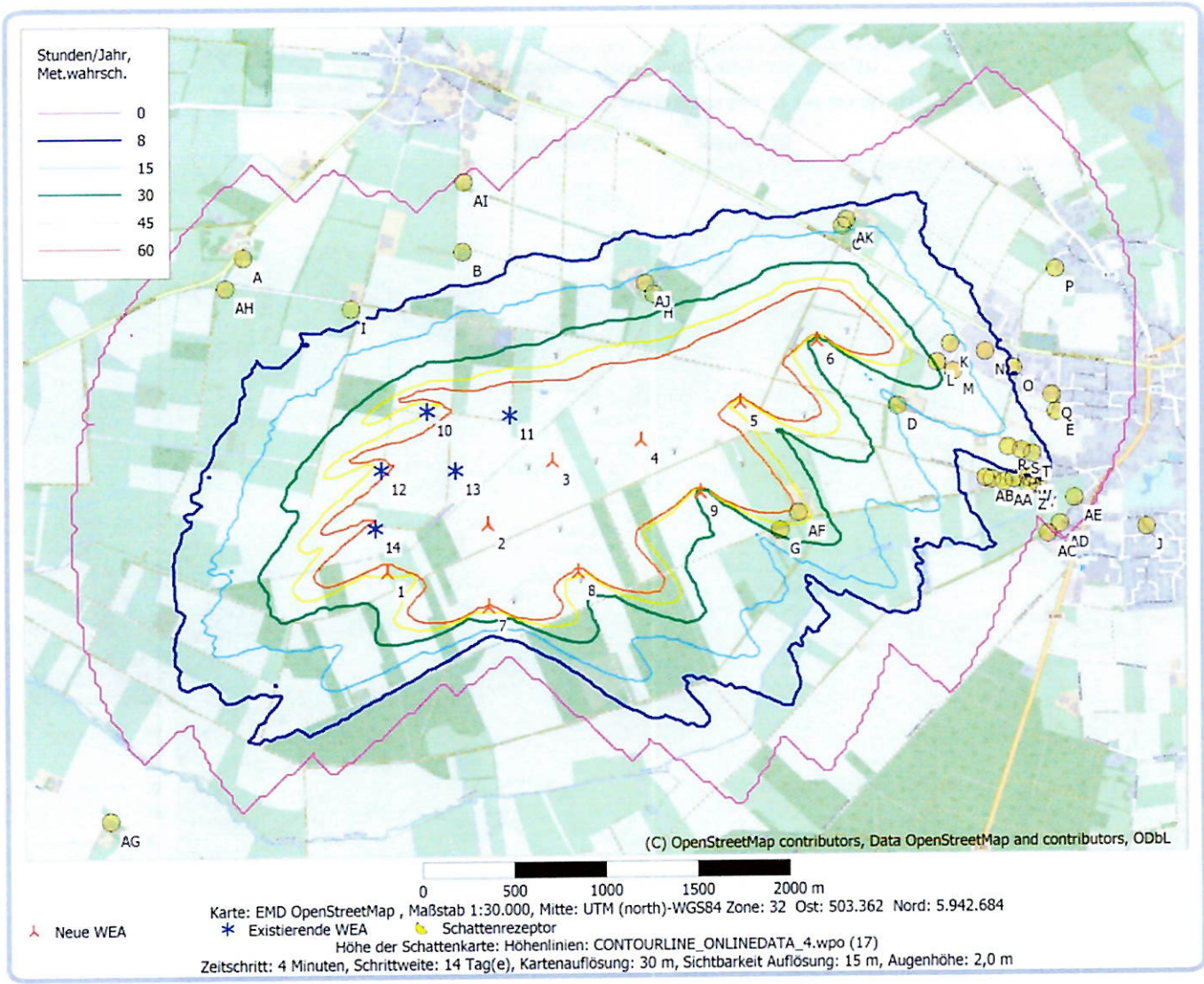
SHADOW - Karte

Berechnung:
SW24020 Lamstedt Gesamtbelastung, Kartendarstellung min/d

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt

Berechnet:
22.08.2024 15:33/4.0.540

windtest grevenbroich gmbh



Projekt:
SW24020 Lamstedt

SHADOW - Karte

Berechnung:
SW24020 Lamstedt Gesamtbelastung, Kartendarstellung h/a mehr wahrsch

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt

Berechnet:
22.08.2024 15:32/4.0.540

Projekt:
SW24020 Lamstedt

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.
Landkreis Cuxhaven
Amt 63
ImG 03 / 2024
21. Okt. 2024

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

Annahmen für Schattenwurfberechnung

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

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

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

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

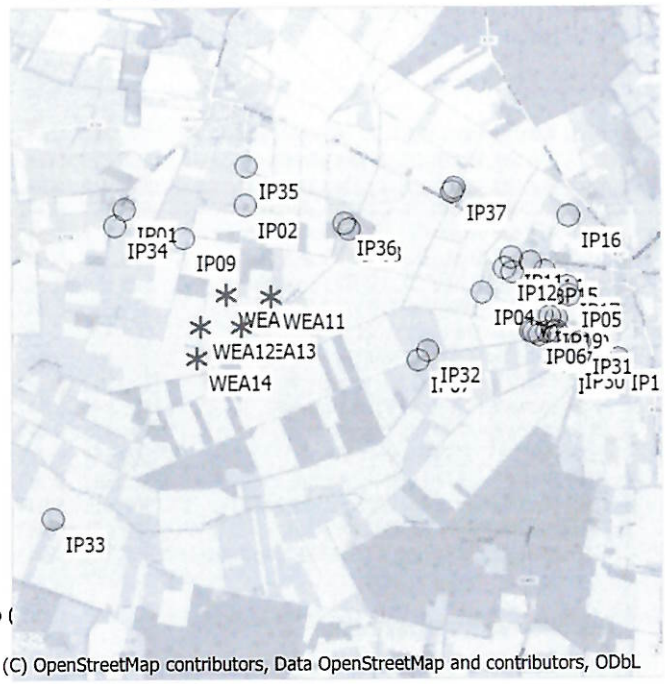
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo (
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



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

Maßstab 1:75.000

✳ Existierende WEA ◔ Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotor-durch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA10	502.407	5.942.842	11,5	E-70 E4 (M2)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA11	502.853	5.942.821	15,0	E-70 E4 (M3)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA12	502.153	5.942.521	10,0	E-70 E4 (M5)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA13	502.556	5.942.520	13,2	E-70 E4 (M6)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA14	502.117	5.942.205	10,0	E-70 E4 (M8)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z [m]	Breite [m]	Höhe [m]	Höhe ü.Gr. [m]	Neigung des Fensters [°]	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr. [m]
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP01	Sticht 1, 21770 Mittelstenahe	8:10	60	0:13	0:52
IP02	Neues Moor 21, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	0:00	0	0:00	0:00
IP04	Wischhofstraße 10, 21769 Lamstedt	0:00	0	0:00	0:00
IP05	Am Kamp 26, 21769 Lamstedt	0:00	0	0:00	0:00
IP06	Strother Heuweg 5, 21769 Lamstedt	0:00	0	0:00	0:00
IP07	Driftweg 2, 21769 Lamstedt	2:37	19	0:11	0:39
IP08	Haneworth 1, 21770 Lamstedt	11:02	58	0:16	1:33
IP09	Sticht 5, 21770 Mittelstenahe	31:02	114	0:24	3:21
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	0:00	0	0:00	0:00
IP12	Auf dem Kampen 6, 21769 Lamstedt	0:00	0	0:00	0:00
IP13	Auf dem Kampen 5, 21769 Lamstedt	0:00	0	0:00	0:00
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	0:00	0	0:00	0:00
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP16	Kleiner Köven 15A, 21769 Lamstedt	0:00	0	0:00	0:00
IP17	An der Gösche 10, 21769 Lamstedt	0:00	0	0:00	0:00
IP18	Wischhofstraße 17a, 21769 Lamstedt	0:00	0	0:00	0:00
IP19	Wischhofstraße 15, 21769 Lamstedt	0:00	0	0:00	0:00
IP20	Wischhofstraße 13, 21769 Lamstedt	0:00	0	0:00	0:00
IP21	Auf der Stroth 18, 21769 Lamstedt	0:00	0	0:00	0:00
IP22	Auf der Stroth 24, 21769 Lamstedt	0:00	0	0:00	0:00
IP23	Auf der Stroth 20, 21769 Lamstedt	0:00	0	0:00	0:00
IP24	Auf der Stroth 23, 21769 Lamstedt	0:00	0	0:00	0:00
IP25	Auf der Stroth 21, 21769 Lamstedt	0:00	0	0:00	0:00
IP26	Auf der Stroth 25, 21769 Lamstedt	0:00	0	0:00	0:00
IP27	Strother Heuweg 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP28	Strother Heuweg 9, 21769 Lamstedt	0:00	0	0:00	0:00
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	0:00	0	0:00	0:00
IP31	Jochensweg 8, 21769 Lamstedt	0:00	0	0:00	0:00
IP32	Driftweg 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	12:23	77	0:14	1:26
IP35	Neues Moor 19, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP36	Haneworth 2, 21770 Lamstedt	11:49	62	0:16	1:34
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	0:00	0	0:00	0:00

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Vorbelastung

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA10	E-70 E4 (M2)	26:40	3:25
WEA11	E-70 E4 (M3)	19:16	2:56
WEA12	E-70 E4 (M5)	7:38	0:43
WEA13	E-70 E4 (M6)	25:16	2:33
WEA14	E-70 E4 (M8)	0:00	0:00

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP01 - Sticht 1, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42			08:12		08:58 (WEA10)	07:15	07:00	05:51	05:02
	16:14			17:05	13	09:11 (WEA10)	18:00	19:58	20:53	21:43
2	08:41			08:10		08:59 (WEA10)	07:12	06:58	05:49	05:01
	16:15			17:07	13	09:12 (WEA10)	18:02	20:00	20:55	21:44
3	08:41			08:08		09:00 (WEA10)	07:10	06:55	05:47	05:00
	16:16			17:09	11	09:11 (WEA10)	18:04	20:02	20:57	21:45
4	08:41			08:07		09:01 (WEA10)	07:08	06:53	05:45	05:00
	16:18			17:11	9	09:10 (WEA10)	18:06	20:04	20:59	21:46
5	08:41			08:05		09:03 (WEA10)	07:05	06:50	05:43	04:59
	16:19			17:13	6	09:09 (WEA10)	18:08	20:06	21:00	21:47
6	08:40			08:03			07:03	06:48	05:41	04:58
	16:20			17:15			18:10	20:08	21:02	21:48
7	08:40			08:01			07:01	06:45	05:39	04:57
	16:21			17:17			18:12	20:09	21:04	21:49
8	08:39			07:59			06:58	06:43	05:37	04:57
	16:23			17:19			18:14	20:11	21:06	21:50
9	08:39			07:57			06:56	06:41	05:35	04:56
	16:24			17:21			18:16	20:13	21:08	21:51
10	08:38			07:55			06:53	06:38	05:34	04:56
	16:26			17:23			18:18	20:15	21:09	21:52
11	08:37		09:14 (WEA13)	07:53			06:51	06:36	05:32	04:55
	16:27	4	09:18 (WEA13)	17:25			18:19	20:17	21:11	21:53
12	08:37		09:13 (WEA13)	07:51			06:49	06:34	05:30	04:55
	16:29	7	09:20 (WEA13)	17:27			18:21	20:19	21:13	21:54
13	08:36		09:13 (WEA13)	07:49			06:46	06:31	05:28	04:55
	16:30	8	09:21 (WEA13)	17:29			18:23	20:20	21:14	21:54
14	08:35		09:13 (WEA13)	07:47			06:44	06:29	05:27	04:54
	16:32	9	09:22 (WEA13)	17:31			18:25	20:22	21:16	21:55
15	08:34		09:13 (WEA13)	07:45			06:41	06:27	05:25	04:54
	16:34	10	09:23 (WEA13)	17:33			18:27	20:24	21:18	21:56
16	08:33		09:13 (WEA13)	07:43			06:39	06:24	05:23	04:54
	16:35	11	09:24 (WEA13)	17:35			18:29	20:26	21:19	21:56
17	08:32		09:14 (WEA13)	07:41			06:37	06:22	05:22	04:54
	16:37	10	09:24 (WEA13)	17:37			18:31	20:28	21:21	21:57
18	08:31		09:14 (WEA13)	07:39			06:34	06:20	05:20	04:54
	16:39	11	09:25 (WEA13)	17:39			18:33	20:30	21:23	21:57
19	08:30		09:14 (WEA13)	07:37			06:32	06:17	05:18	04:54
	16:41	10	09:24 (WEA13)	17:41			18:34	20:31	21:24	21:58
20	08:29		09:15 (WEA13)	07:35			06:29	06:15	05:17	04:54
	16:42	10	09:25 (WEA13)	17:43			18:36	20:33	21:26	21:58
21	08:28		09:15 (WEA13)	07:33			06:27	06:13	05:15	04:54
	16:44	9	09:24 (WEA13)	17:45			18:38	20:35	21:27	21:58
22	08:26		09:17 (WEA13)	07:30			06:24	06:11	05:14	04:54
	16:46	6	09:23 (WEA13)	17:47			18:40	20:37	21:29	21:58
23	08:25		09:20 (WEA13)	07:28			06:22	06:08	05:13	04:54
	16:48	2	09:22 (WEA13)	17:49			18:42	20:39	21:31	21:58
24	08:24			07:26			06:19	06:06	05:11	04:55
	16:50			17:51			18:44	20:41	21:32	21:59
25	08:22			07:24			06:17	06:04	05:10	04:55
	16:51			17:53			18:45	20:42	21:33	21:59
26	08:21		09:02 (WEA10)	07:21			06:15	06:02	05:09	04:55
	16:53	4	09:06 (WEA10)	17:55			18:47	20:44	21:35	21:59
27	08:20		09:00 (WEA10)	07:19			06:12	06:00	05:08	04:56
	16:55	8	09:08 (WEA10)	17:56			18:49	20:46	21:36	21:59
28	08:18		08:59 (WEA10)	07:17			06:10	05:57	05:06	04:56
	16:57	10	09:09 (WEA10)	17:58			18:51	20:48	21:38	21:58
29	08:17		08:59 (WEA10)				07:07	05:55	05:05	04:57
	16:59	12	09:11 (WEA10)				19:53	20:50	21:39	21:58
30	08:15		08:58 (WEA10)				07:05	05:53	05:04	04:58
	17:01	13	09:11 (WEA10)				19:55	20:51	21:40	21:58
31	08:13		08:58 (WEA10)				07:02		05:03	
	17:03	13	09:11 (WEA10)				19:57		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		167			52					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,97			0,97					
Reduktion Windrichtung		0,59			0,60					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		16			7					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP01 - Sticht 1, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November		Dezember		
1	04:58	05:38	06:32	07:24	07:22			08:17	08:56 (WEA13)
	21:58	21:23	20:17	19:03	16:53			16:09	5 09:01 (WEA13)
2	04:59	05:39	06:33	07:26	07:24			08:18	
	21:57	21:21	20:14	19:01	16:51			16:08	
3	05:00	05:41	06:35	07:28	07:26			08:20	
	21:57	21:19	20:12	18:58	16:49			16:08	
4	05:01	05:43	06:37	07:30	07:28			08:21	
	21:56	21:17	20:09	18:56	16:47			16:07	
5	05:01	05:44	06:39	07:32	07:30			08:23	
	21:56	21:15	20:07	18:54	16:45			16:07	
6	05:02	05:46	06:40	07:33	07:32		08:32 (WEA10)	08:24	
	21:55	21:13	20:05	18:51	16:44	7	08:39 (WEA10)	16:06	
7	05:03	05:48	06:42	07:35	07:34		08:31 (WEA10)	08:25	
	21:55	21:12	20:02	18:49	16:42	9	08:40 (WEA10)	16:06	
8	05:04	05:50	06:44	07:37	07:36		08:30 (WEA10)	08:27	
	21:54	21:10	20:00	18:46	16:40	11	08:41 (WEA10)	16:05	
9	05:05	05:51	06:46	07:39	07:38		08:29 (WEA10)	08:28	
	21:53	21:08	19:57	18:44	16:38	13	08:42 (WEA10)	16:05	
10	05:06	05:53	06:47	07:41	07:40		08:29 (WEA10)	08:29	
	21:52	21:06	19:55	18:42	16:36	13	08:42 (WEA10)	16:04	
11	05:08	05:55	06:49	07:43	07:41		08:30 (WEA10)	08:30	
	21:51	21:04	19:52	18:39	16:35	13	08:43 (WEA10)	16:04	
12	05:09	05:56	06:51	07:44	07:43		08:30 (WEA10)	08:31	
	21:50	21:01	19:50	18:37	16:33	13	08:43 (WEA10)	16:04	
13	05:10	05:58	06:53	07:46	07:45		08:31 (WEA10)	08:32	
	21:50	20:59	19:48	18:35	16:31	11	08:42 (WEA10)	16:04	
14	05:11	06:00	06:54	07:48	07:47		08:32 (WEA10)	08:33	
	21:48	20:57	19:45	18:32	16:30	10	08:42 (WEA10)	16:04	
15	05:12	06:02	06:56	07:50	07:49		08:33 (WEA10)	08:34	
	21:47	20:55	19:43	18:30	16:28	8	08:41 (WEA10)	16:04	
16	05:14	06:03	06:58	07:52	07:51		08:35 (WEA10)	08:35	09:53 (WEA12)
	21:46	20:53	19:40	18:28	16:27	4	08:39 (WEA10)	16:04	1 09:54 (WEA12)
17	05:15	06:05	07:00	07:54	07:53			08:36	09:52 (WEA12)
	21:45	20:51	19:38	18:25	16:25			16:04	4 09:56 (WEA12)
18	05:16	06:07	07:01	07:56	07:55			08:37	09:52 (WEA12)
	21:44	20:49	19:35	18:23	16:24			16:04	4 09:56 (WEA12)
19	05:18	06:09	07:03	07:57	07:56		08:54 (WEA13)	08:38	09:52 (WEA12)
	21:43	20:47	19:33	18:21	16:22	2	08:56 (WEA13)	16:05	5 09:57 (WEA12)
20	05:19	06:10	07:05	07:59	07:58		08:52 (WEA13)	08:38	09:53 (WEA12)
	21:41	20:44	19:30	18:19	16:21	6	08:58 (WEA13)	16:05	5 09:58 (WEA12)
21	05:21	06:12	07:07	08:01	08:00		08:51 (WEA13)	08:39	09:53 (WEA12)
	21:40	20:42	19:28	18:16	16:20	9	09:00 (WEA13)	16:05	5 09:58 (WEA12)
22	05:22	06:14	07:08	08:03	08:02		08:51 (WEA13)	08:39	09:54 (WEA12)
	21:39	20:40	19:25	18:14	16:18	10	09:01 (WEA13)	16:06	5 09:59 (WEA12)
23	05:24	06:16	07:10	08:05	08:04		08:51 (WEA13)	08:40	09:54 (WEA12)
	21:37	20:38	19:23	18:12	16:17	10	09:01 (WEA13)	16:06	5 09:59 (WEA12)
24	05:25	06:18	07:12	08:07	08:05		08:51 (WEA13)	08:40	09:54 (WEA12)
	21:36	20:35	19:20	18:10	16:16	11	09:02 (WEA13)	16:07	5 09:59 (WEA12)
25	05:27	06:19	07:14	07:09	08:07		08:52 (WEA13)	08:41	09:55 (WEA12)
	21:34	20:33	19:18	17:08	16:15	10	09:02 (WEA13)	16:08	5 10:00 (WEA12)
26	05:28	06:21	07:16	07:11	08:09		08:51 (WEA13)	08:41	09:56 (WEA12)
	21:33	20:31	19:16	17:05	16:14	11	09:02 (WEA13)	16:08	4 10:00 (WEA12)
27	05:30	06:23	07:17	07:13	08:10		08:52 (WEA13)	08:41	09:57 (WEA12)
	21:31	20:28	19:13	17:03	16:13	10	09:02 (WEA13)	16:09	3 10:00 (WEA12)
28	05:31	06:25	07:19	07:15	08:12		08:53 (WEA13)	08:41	
	21:30	20:26	19:11	17:01	16:12	9	09:02 (WEA13)	16:10	
29	05:33	06:26	07:21	07:16	08:14		08:54 (WEA13)	08:42	
	21:28	20:24	19:08	16:59	16:11	8	09:02 (WEA13)	16:11	
30	05:34	06:28	07:23	07:18	08:15		08:55 (WEA13)	08:42	
	21:26	20:21	19:06	16:57	16:10	7	09:02 (WEA13)	16:12	
31	05:36	06:30		07:20				08:42	
	21:24	20:19		16:55				16:13	
Sonnenscheinstunden	511	459	382	329	260			234	
astr.max.mögl.Beschattung						215			56
Red.Sonnenscheinwahrsch.						0,19			0,14
Reduktion Betriebsdauer						0,97			0,97
Reduktion Windrichtung						0,59			0,61
Gesamte Reduktion						0,11			0,08
Met.wahrsch.Beschattung						24			5

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP02 - Neues Moor 21, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:43	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:36	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:55	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38
	16:40	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:20	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:23	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:59	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:07	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:56		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP03 - Mittelstenaher Str. 30, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:37	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53	08:36
	16:37	17:37	18:30	20:28	21:21	21:57	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:28	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP04 - Wischhofstraße 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP05 - Am Kamp 26, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP06 - Strother Heuweg 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP07 - Driftweg 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai			Juni	Juli			August			September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51			05:02	04:58			05:38		20:31 (WEA11)	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53			21:43	21:57			21:22	9	20:40 (WEA11)	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49			05:01	04:59			05:39		20:31 (WEA11)	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55			21:44	21:57			21:21	10	20:41 (WEA11)	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47			05:00	05:00			05:41		20:30 (WEA11)	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57			21:45	21:57			21:19	10	20:40 (WEA11)	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:53	05:45			04:59	05:00			05:43		20:30 (WEA11)	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58			21:46	21:56			21:17	11	20:41 (WEA11)	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05	06:50	05:43		20:23 (WEA11)	04:59	05:01			05:44		20:30 (WEA11)	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	5	20:28 (WEA11)	21:47	21:56			21:15	10	20:40 (WEA11)	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41		20:21 (WEA11)	04:58	05:02			05:46		20:31 (WEA11)	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	8	20:29 (WEA11)	21:48	21:55			21:13	9	20:40 (WEA11)	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39		20:20 (WEA11)	04:57	05:03			05:48		20:31 (WEA11)	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	9	20:29 (WEA11)	21:49	21:54			21:11	7	20:38 (WEA11)	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37		20:20 (WEA11)	04:57	05:04			05:49		20:33 (WEA11)	06:44	07:37	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	10	20:30 (WEA11)	21:50	21:54			21:09	3	20:36 (WEA11)	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:41	05:35		20:20 (WEA11)	04:56	05:05			05:51			06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	10	20:30 (WEA11)	21:51	21:53			21:07			19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34		20:19 (WEA11)	04:56	05:06			05:53			06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	11	20:30 (WEA11)	21:52	21:52			21:05			19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32		20:20 (WEA11)	04:55	05:07			05:55			06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	10	20:30 (WEA11)	21:53	21:51			21:03			19:52	18:39	16:35	16:04
12	08:36	07:51	06:48	06:33	05:30		20:21 (WEA11)	04:55	05:09			05:56			06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	8	20:29 (WEA11)	21:53	21:50			21:01			19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28		20:21 (WEA11)	04:54	05:10			05:58			06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	6	20:27 (WEA11)	21:54	21:49			20:59			19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26			04:54	05:11			06:00			06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16			21:55	21:48			20:57			19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25			04:54	05:12			06:02			06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18			21:55	21:47			20:55			19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23			04:54	05:14			06:03			06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19			21:56	21:46			20:53			19:40	18:27	16:27	16:04
17	08:32	07:41	06:36	06:22	05:21			04:54	05:15			06:05			06:59	07:53	07:53	08:36
	16:37	17:37	18:31	20:28	21:21			21:56	21:45			20:51			19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20			04:54	05:16			06:07			07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22			21:57	21:44			20:48			19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18			04:54	05:18			06:09			07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24			21:57	21:42			20:46			19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17			04:54	05:19			06:10			07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26			21:58	21:41			20:44			19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15			04:54	05:20			06:12			07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27			21:58	21:40			20:42			19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:10	05:14			04:54	05:22			06:14			07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29			21:58	21:38			20:40			19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13			04:54	05:23			06:16			07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30			21:58	21:37			20:37			19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11			04:55	05:25			06:17			07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32			21:58	21:36			20:35			19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10			04:55	05:26			06:19			07:14	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33			21:58	21:34			20:33			19:18	17:07	16:15	16:08
26	08:21	07:21	06:14	06:02	05:09			04:55	05:28			06:21			07:15	07:10	08:09	08:41
	16:53	17:54	18:47	20:44	21:35			21:58	21:32			20:30			19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07			04:56	05:30			06:23			07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36			21:58	21:31			20:28			19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06			04:56	05:31			06:24			07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37			21:58	21:29			20:26			19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05			04:57	05:33			06:26			07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39			21:58	21:28			20:23			19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04			04:57	05:34		20:33 (WEA11)	06:28			07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40			21:58	21:26	4	20:37 (WEA11)	20:21			19:06	16:57	16:10	16:12
31	08:13		07:02		05:03				05:36		20:31 (WEA11)	06:30				07:20		08:41
	17:03		19:56		21:41				21:24	7	20:38 (WEA11)	20:19				16:55		16:13
Sonnenscheinstunden	251	274	367	420	493			509	511			459			382	329	260	234
astr.max.mögl.Beschattung						77				11			69					
Red.Sonnenscheinwahrsch.						0,43				0,38			0,42					
Reduktion Betriebsdauer						0,97				0,97			0,97					
Reduktion Windrichtung						0,62				0,62			0,62					
Gesamte Reduktion						0,26				0,23			0,25					
Met.wahrsch.Beschattung						20				2			18					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:41			08:12		16:00 (WEA11)	07:14	07:00	05:51	05:02
	16:14			17:05	14	16:14 (WEA11)	18:00	19:58	20:53	21:43
2	08:41			08:10		15:59 (WEA11)	07:12	06:57	05:49	05:01
	16:15			17:07	15	16:14 (WEA11)	18:02	20:00	20:55	21:44
3	08:41			08:08		15:59 (WEA11)	07:10	06:55	05:47	05:00
	16:16			17:09	16	16:15 (WEA11)	18:04	20:02	20:57	21:45
4	08:41			08:06		16:00 (WEA11)	07:08	06:53	05:45	04:59
	16:17			17:11	16	16:16 (WEA11)	18:06	20:04	20:59	21:46
5	08:40			08:05		16:00 (WEA11)	07:05	06:50	05:43	04:59
	16:19			17:13	16	16:16 (WEA11)	18:08	20:06	21:00	21:47
6	08:40			08:03		16:00 (WEA11)	07:03	06:48	05:41	04:58
	16:20			17:15	16	16:16 (WEA11)	18:10	20:07	21:02	21:48
7	08:40			08:01		16:01 (WEA11)	07:00	06:45	05:39	04:57
	16:21			17:17	15	16:16 (WEA11)	18:12	20:09	21:04	21:49
8	08:39			07:59		16:02 (WEA11)	06:58	06:43	05:37	04:57
	16:23			17:19	13	16:15 (WEA11)	18:14	20:11	21:06	21:50
9	08:39			07:57		16:03 (WEA11)	06:56	06:41	05:35	04:56
	16:24			17:21	11	16:14 (WEA11)	18:16	20:13	21:07	21:51
10	08:38			07:55		16:05 (WEA11)	06:53	06:38	05:34	04:56
	16:26			17:23	7	16:12 (WEA11)	18:17	20:15	21:09	21:52
11	08:37			07:53			06:51	06:36	05:32	04:55
	16:27			17:25			18:19	20:17	21:11	21:53
12	08:37			07:51			06:49	06:33	05:30	04:55
	16:29			17:27			18:21	20:18	21:13	21:54
13	08:36			07:49			06:46	06:31	05:28	04:54
	16:30			17:29			18:23	20:20	21:14	21:54
14	08:35			07:47			06:44	06:29	05:26	04:54
	16:32			17:31			18:25	20:22	21:16	21:55
15	08:34			07:45		16:53 (WEA10)	06:41	06:26	05:25	04:54
	16:34			17:33	7	17:00 (WEA10)	18:27	20:24	21:18	21:56
16	08:33			07:43		16:52 (WEA10)	06:39	06:24	05:23	04:54
	16:35			17:35	9	17:01 (WEA10)	18:29	20:26	21:19	21:56
17	08:32			07:41		16:51 (WEA10)	06:36	06:22	05:21	04:54
	16:37			17:37	11	17:02 (WEA10)	18:31	20:28	21:21	21:57
18	08:31			07:39		16:50 (WEA10)	06:34	06:20	05:20	04:54
	16:39			17:39	12	17:02 (WEA10)	18:32	20:29	21:23	21:57
19	08:30			07:37		16:50 (WEA10)	06:32	06:17	05:18	04:54
	16:40			17:41	12	17:02 (WEA10)	18:34	20:31	21:24	21:57
20	08:29			07:35		16:51 (WEA10)	06:29	06:15	05:17	04:54
	16:42			17:43	11	17:02 (WEA10)	18:36	20:33	21:26	21:58
21	08:28		15:59 (WEA13)	07:32		16:52 (WEA10)	06:27	06:13	05:15	04:54
	16:44	6	16:05 (WEA13)	17:45	9	17:01 (WEA10)	18:38	20:35	21:27	21:58
22	08:26		15:59 (WEA13)	07:30		16:53 (WEA10)	06:24	06:10	05:14	04:54
	16:46	8	16:07 (WEA13)	17:47	6	16:59 (WEA10)	18:40	20:37	21:29	21:58
23	08:25		15:58 (WEA13)	07:28			06:22	06:08	05:13	04:54
	16:48	10	16:08 (WEA13)	17:49			18:42	20:39	21:30	21:58
24	08:24		15:58 (WEA13)	07:26			06:19	06:06	05:11	04:55
	16:49	11	16:09 (WEA13)	17:50			18:44	20:40	21:32	21:58
25	08:22		15:58 (WEA13)	07:24			06:17	06:04	05:10	04:55
	16:51	11	16:09 (WEA13)	17:52			18:45	20:42	21:33	21:58
26	08:21		15:58 (WEA13)	07:21			06:14	06:02	05:09	04:55
	16:53	12	16:10 (WEA13)	17:54			18:47	20:44	21:35	21:58
27	08:19		15:58 (WEA13)	07:19			06:12	05:59	05:07	04:56
	16:55	12	16:10 (WEA13)	17:56			18:49	20:46	21:36	21:58
28	08:18		15:59 (WEA13)	07:17			06:10	05:57	05:06	04:56
	16:57	11	16:10 (WEA13)	17:58			18:51	20:48	21:38	21:58
29	08:16		16:00 (WEA13)				07:07	05:55	05:05	04:57
	16:59	10	16:10 (WEA13)				19:53	20:50	21:39	21:58
30	08:15		16:01 (WEA13)				07:05	05:53	05:04	04:57
	17:01	11	16:12 (WEA11)				19:55	20:51	21:40	21:58
31	08:13		16:01 (WEA11)				07:02		05:03	
	17:03	12	16:13 (WEA11)				19:56		21:41	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		114			216					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,97			0,97					
Reduktion Windrichtung		0,67			0,67					
Gesamte Reduktion		0,11			0,16					
Met.wahrsch.Beschattung		13			34					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober			November		Dezember
1	04:58	05:38	06:31	07:24			07:22		15:33 (WEA11)	08:17
	21:57	21:23	20:16	19:03			16:53	8	15:41 (WEA11)	16:09
2	04:59	05:39	06:33	07:26			07:24		15:31 (WEA11)	08:18
	21:57	21:21	20:14	19:01			16:51	12	15:43 (WEA11)	16:08
3	05:00	05:41	06:35	07:28			07:26		15:31 (WEA11)	08:20
	21:57	21:19	20:12	18:58			16:49	14	15:45 (WEA11)	16:08
4	05:00	05:43	06:37	07:30			07:28		15:30 (WEA11)	08:21
	21:56	21:17	20:09	18:56			16:47	15	15:45 (WEA11)	16:07
5	05:01	05:44	06:38	07:31			07:30		15:30 (WEA11)	08:23
	21:56	21:15	20:07	18:53			16:45	16	15:46 (WEA11)	16:06
6	05:02	05:46	06:40	07:33			07:32		15:30 (WEA11)	08:24
	21:55	21:13	20:04	18:51			16:43	16	15:46 (WEA11)	16:06
7	05:03	05:48	06:42	07:35			07:34		15:30 (WEA11)	08:25
	21:54	21:11	20:02	18:49			16:42	16	15:46 (WEA11)	16:05
8	05:04	05:49	06:44	07:37			07:36		15:30 (WEA11)	08:27
	21:54	21:09	20:00	18:46			16:40	16	15:46 (WEA11)	16:05
9	05:05	05:51	06:45	07:39			07:38		15:30 (WEA11)	08:28
	21:53	21:07	19:57	18:44			16:38	15	15:45 (WEA11)	16:05
10	05:06	05:53	06:47	07:41			07:39		15:31 (WEA11)	08:29
	21:52	21:05	19:55	18:42			16:36	14	15:45 (WEA11)	16:04
11	05:07	05:55	06:49	07:42			07:41		15:32 (WEA11)	08:30
	21:51	21:03	19:52	18:39			16:35	12	15:44 (WEA11)	16:04
12	05:09	05:56	06:51	07:44			07:43		15:32 (WEA13)	08:31
	21:50	21:01	19:50	18:37			16:33	10	15:42 (WEA11)	16:04
13	05:10	05:58	06:52	07:46			07:45		15:32 (WEA13)	08:32
	21:49	20:59	19:47	18:34			16:31	10	15:42 (WEA13)	16:04
14	05:11	06:00	06:54	07:48			07:47		15:32 (WEA13)	08:33
	21:48	20:57	19:45	18:32			16:30	11	15:43 (WEA13)	16:04
15	05:12	06:02	06:56	07:50			07:49		15:31 (WEA13)	08:34
	21:47	20:55	19:42	18:30			16:28	12	15:43 (WEA13)	16:04
16	05:14	06:03	06:58	07:52			07:51		15:31 (WEA13)	08:35
	21:46	20:53	19:40	18:28			16:27	12	15:43 (WEA13)	16:04
17	05:15	06:05	06:59	07:54			07:53		15:32 (WEA13)	08:36
	21:45	20:51	19:38	18:25			16:25	11	15:43 (WEA13)	16:04
18	05:16	06:07	07:01	07:55			07:54		15:32 (WEA13)	08:37
	21:44	20:49	19:35	18:23			16:24	11	15:43 (WEA13)	16:04
19	05:18	06:09	07:03	07:57			07:56		15:33 (WEA13)	08:37
	21:43	20:46	19:33	18:21			16:22	10	15:43 (WEA13)	16:05
20	05:19	06:10	07:05	07:59		17:23 (WEA10)	07:58		15:34 (WEA13)	08:38
	21:41	20:44	19:30	18:18	8	17:31 (WEA10)	16:21	8	15:42 (WEA13)	16:05
21	05:20	06:12	07:07	08:01		17:22 (WEA10)	08:00		15:35 (WEA13)	08:39
	21:40	20:42	19:28	18:16	10	17:32 (WEA10)	16:20	6	15:41 (WEA13)	16:05
22	05:22	06:14	07:08	08:03		17:21 (WEA10)	08:02			08:39
	21:39	20:40	19:25	18:14	11	17:32 (WEA10)	16:18			16:06
23	05:23	06:16	07:10	08:05		17:21 (WEA10)	08:03			08:40
	21:37	20:37	19:23	18:12	12	17:33 (WEA10)	16:17			16:06
24	05:25	06:17	07:12	08:07		17:21 (WEA10)	08:05			08:40
	21:36	20:35	19:20	18:10	11	17:32 (WEA10)	16:16			16:07
25	05:26	06:19	07:14	07:09		16:21 (WEA10)	08:07			08:41
	21:34	20:33	19:18	17:07	11	16:32 (WEA10)	16:15			16:08
26	05:28	06:21	07:15	07:11		16:22 (WEA10)	08:09			08:41
	21:33	20:31	19:15	17:05	9	16:31 (WEA10)	16:14			16:08
27	05:30	06:23	07:17	07:12		16:23 (WEA10)	08:10			08:41
	21:31	20:28	19:13	17:03	5	16:28 (WEA10)	16:13			16:09
28	05:31	06:24	07:19	07:14			08:12			08:41
	21:29	20:26	19:10	17:01			16:12			16:10
29	05:33	06:26	07:21	07:16			08:14			08:41
	21:28	20:24	19:08	16:59			16:11			16:11
30	05:34	06:28	07:22	07:18			08:15			08:41
	21:26	20:21	19:06	16:57			16:10			16:12
31	05:36	06:30		07:20						08:41
	21:24	20:19		16:55						16:13
Sonnenscheinstunden	511	459	382	329			260			234
astr.max.mögl.Beschattung				77			255			
Red.Sonnenscheinwahrsch.				0,29			0,19			
Reduktion Betriebsdauer				0,97			0,97			
Reduktion Windrichtung				0,68			0,67			
Gesamte Reduktion				0,19			0,13			
Met.wahrsch.Beschattung				15			32			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai	Juni
1	08:42		09:56 (WEA13)	08:12	09:54 (WEA10)	07:15	07:00	05:51	05:02
	16:14	16	10:12 (WEA13)	17:05 20	10:14 (WEA10)	18:00	19:58	20:53	21:43
2	08:41		09:56 (WEA13)	08:10	09:54 (WEA10)	07:12	06:58	05:49	05:01
	16:15	17	10:13 (WEA13)	17:07 19	10:13 (WEA10)	18:02	20:00	20:55	21:44
3	08:41		09:57 (WEA13)	08:08	09:57 (WEA10)	07:10	06:55	05:47	05:00
	16:16	17	10:14 (WEA13)	17:09 16	10:13 (WEA10)	18:04	20:02	20:57	21:45
4	08:41		09:57 (WEA13)	08:06	09:58 (WEA10)	07:08	06:53	05:45	04:59
	16:18	16	10:13 (WEA13)	17:11 13	10:11 (WEA10)	18:06	20:04	20:59	21:46
5	08:41		09:58 (WEA13)	08:05	10:01 (WEA10)	07:05	06:50	05:43	04:59
	16:19	16	10:14 (WEA13)	17:13 8	10:09 (WEA10)	18:08	20:06	21:00	21:47
6	08:40		09:58 (WEA13)	08:03		07:03	06:48	05:41	04:58
	16:20	16	10:14 (WEA13)	17:15		18:10	20:08	21:02	21:48
7	08:40		09:59 (WEA13)	08:01		07:01	06:45	05:39	04:57
	16:21	15	10:14 (WEA13)	17:17		18:12	20:09	21:04	21:49
8	08:39		10:00 (WEA13)	07:59		06:58	06:43	05:37	04:57
	16:23	15	10:15 (WEA13)	17:19		18:14	20:11	21:06	21:50
9	08:39		10:01 (WEA13)	07:57	08:44 (WEA11)	06:56	06:41	05:35	04:56
	16:24	14	10:15 (WEA13)	17:21 8	08:52 (WEA11)	18:16	20:13	21:07	21:51
10	08:38		10:01 (WEA13)	07:55	08:42 (WEA11)	06:53	06:38	05:34	04:56
	16:26	13	10:14 (WEA13)	17:23 12	08:54 (WEA11)	18:18	20:15	21:09	21:52
11	08:37		10:02 (WEA13)	07:53	08:41 (WEA11)	06:51	06:36	05:32	04:55
	16:27	12	10:14 (WEA13)	17:25 14	08:55 (WEA11)	18:19	20:17	21:11	21:53
12	08:37		10:03 (WEA13)	07:51	08:40 (WEA11)	06:49	06:34	05:30	04:55
	16:29	10	10:13 (WEA13)	17:27 15	08:55 (WEA11)	18:21	20:19	21:13	21:54
13	08:36		10:05 (WEA13)	07:49	08:40 (WEA11)	06:46	06:31	05:28	04:55
	16:30	8	10:13 (WEA13)	17:29 15	08:55 (WEA11)	18:23	20:20	21:14	21:54
14	08:35		09:56 (WEA10)	07:47	08:40 (WEA11)	06:44	06:29	05:27	04:54
	16:32	9	10:11 (WEA13)	17:31 15	08:55 (WEA11)	18:25	20:22	21:16	21:55
15	08:34		09:54 (WEA10)	07:45	08:40 (WEA11)	06:41	06:27	05:25	04:54
	16:34	11	10:05 (WEA10)	17:33 15	08:55 (WEA11)	18:27	20:24	21:18	21:56
16	08:33		09:53 (WEA10)	07:43	08:40 (WEA11)	06:39	06:24	05:23	04:54
	16:35	14	10:07 (WEA10)	17:35 15	08:55 (WEA11)	18:29	20:26	21:19	21:56
17	08:32		09:53 (WEA10)	07:41	08:41 (WEA11)	06:37	06:22	05:22	04:54
	16:37	15	10:08 (WEA10)	17:37 14	08:55 (WEA11)	18:31	20:28	21:21	21:57
18	08:31		09:52 (WEA10)	07:39	08:41 (WEA11)	06:34	06:20	05:20	04:54
	16:39	17	10:09 (WEA10)	17:39 12	08:53 (WEA11)	18:33	20:30	21:23	21:57
19	08:30		09:51 (WEA10)	07:37	08:44 (WEA11)	06:32	06:17	05:18	04:54
	16:40	19	10:10 (WEA10)	17:41 7	08:51 (WEA11)	18:34	20:31	21:24	21:57
20	08:29		09:51 (WEA10)	07:35		06:29	06:15	05:17	04:54
	16:42	21	10:12 (WEA10)	17:43		18:36	20:33	21:26	21:58
21	08:28		09:51 (WEA10)	07:33		06:27	06:13	05:15	04:54
	16:44	21	10:12 (WEA10)	17:45		18:38	20:35	21:27	21:58
22	08:26		09:51 (WEA10)	07:30		06:24	06:11	05:14	04:54
	16:46	22	10:13 (WEA10)	17:47		18:40	20:37	21:29	21:58
23	08:25		09:50 (WEA10)	07:28		06:22	06:08	05:13	04:54
	16:48	23	10:13 (WEA10)	17:49		18:42	20:39	21:30	21:58
24	08:24		09:51 (WEA10)	07:26		06:19	06:06	05:11	04:55
	16:50	23	10:14 (WEA10)	17:51		18:44	20:41	21:32	21:59
25	08:22		09:50 (WEA10)	07:24		06:17	06:04	05:10	04:55
	16:51	24	10:14 (WEA10)	17:53		18:45	20:42	21:33	21:59
26	08:21		09:51 (WEA10)	07:21		06:15	06:02	05:09	04:55
	16:53	24	10:15 (WEA10)	17:54		18:47	20:44	21:35	21:59
27	08:20		09:51 (WEA10)	07:19		06:12	06:00	05:07	04:56
	16:55	24	10:15 (WEA10)	17:56		18:49	20:46	21:36	21:58
28	08:18		09:51 (WEA10)	07:17		06:10	05:57	05:06	04:56
	16:57	24	10:15 (WEA10)	17:58		18:51	20:48	21:38	21:58
29	08:16		09:52 (WEA10)			07:07	05:55	05:05	04:57
	16:59	24	10:16 (WEA10)			19:53	20:50	21:39	21:58
30	08:15		09:52 (WEA10)			07:05	05:53	05:04	04:58
	17:01	23	10:15 (WEA10)			19:55	20:51	21:40	21:58
31	08:13		09:53 (WEA10)			07:02		05:03	
	17:03	22	10:15 (WEA10)			19:56		21:42	
Sonnenscheinstunden	251			274		367	420	493	509
astr.max.mögl.Beschattung		545		218					
Red.Sonnenscheinwahrsch.		0,17		0,24					
Reduktion Betriebsdauer		0,97		0,97					
Reduktion Windrichtung		0,60		0,61					
Gesamte Reduktion		0,10		0,14					
Met.wahrsch.Beschattung		54		31					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober			November			Dezember		
1	04:58		05:38		06:32		07:24			07:22		08:11 (WEA11)	08:17		09:44 (WEA13)
	21:58		21:23		20:17		19:03			16:53	11	08:22 (WEA11)	16:09	12	09:56 (WEA13)
2	04:59		05:39		06:33		07:26			07:24		08:14 (WEA11)	08:18		09:45 (WEA13)
	21:57		21:21		20:14		19:01			16:51	7	08:21 (WEA11)	16:08	12	09:57 (WEA13)
3	05:00		05:41		06:35		07:28			07:26			08:20		09:44 (WEA13)
	21:57		21:19		20:12		18:58			16:49			16:08	14	09:58 (WEA13)
4	05:01		05:43		06:37		07:30			07:28			08:21		09:44 (WEA13)
	21:56		21:17		20:09		18:56			16:47			16:07	15	09:59 (WEA13)
5	05:01		05:44		06:39		07:32			07:30			08:23		09:45 (WEA13)
	21:56		21:15		20:07		18:54			16:45			16:06	15	10:00 (WEA13)
6	05:02		05:46		06:40		07:33			07:32		09:30 (WEA10)	08:24		09:45 (WEA13)
	21:55		21:13		20:05		18:51			16:44	9	09:39 (WEA10)	16:06	15	10:00 (WEA13)
7	05:03		05:48		06:42		07:35			07:34		09:28 (WEA10)	08:25		09:44 (WEA13)
	21:54		21:11		20:02		18:49			16:42	13	09:41 (WEA10)	16:05	16	10:00 (WEA13)
8	05:04		05:50		06:44		07:37			07:36		09:26 (WEA10)	08:27		09:45 (WEA13)
	21:54		21:10		20:00		18:46			16:40	17	09:43 (WEA10)	16:05	17	10:02 (WEA13)
9	05:05		05:51		06:46		07:39			07:38		09:25 (WEA10)	08:28		09:45 (WEA13)
	21:53		21:08		19:57		18:44			16:38	19	09:44 (WEA10)	16:05	17	10:02 (WEA13)
10	05:06		05:53		06:47		07:41			07:40		09:24 (WEA10)	08:29		09:45 (WEA13)
	21:52		21:06		19:55		18:42			16:36	21	09:45 (WEA10)	16:04	17	10:02 (WEA13)
11	05:08		05:55		06:49		07:43			07:41		09:24 (WEA10)	08:30		09:47 (WEA13)
	21:51		21:04		19:52		18:39			16:35	22	09:46 (WEA10)	16:04	16	10:03 (WEA13)
12	05:09		05:56		06:51		07:44			07:43		09:24 (WEA10)	08:31		09:47 (WEA13)
	21:50		21:01		19:50		18:37			16:33	23	09:47 (WEA10)	16:04	17	10:04 (WEA13)
13	05:10		05:58		06:53		07:46			07:45		09:24 (WEA10)	08:32		09:47 (WEA13)
	21:49		20:59		19:47		18:35			16:31	24	09:48 (WEA10)	16:04	17	10:04 (WEA13)
14	05:11		06:00		06:54		07:48			07:47		09:24 (WEA10)	08:33		09:48 (WEA13)
	21:48		20:57		19:45		18:32			16:30	24	09:48 (WEA10)	16:04	16	10:04 (WEA13)
15	05:12		06:02		06:56		07:50			07:49		09:24 (WEA10)	08:34		09:48 (WEA13)
	21:47		20:55		19:43		18:30			16:28	24	09:48 (WEA10)	16:04	17	10:05 (WEA13)
16	05:14		06:03		06:58		07:52			07:51		09:24 (WEA10)	08:35		09:49 (WEA13)
	21:46		20:53		19:40		18:28			16:27	24	09:48 (WEA10)	16:04	16	10:05 (WEA13)
17	05:15		06:05		07:00		07:54			07:53		09:24 (WEA10)	08:36		09:48 (WEA13)
	21:45		20:51		19:38		18:25			16:25	24	09:48 (WEA10)	16:04	17	10:05 (WEA13)
18	05:16		06:07		07:01		07:56			07:55		09:25 (WEA10)	08:37		09:49 (WEA13)
	21:44		20:49		19:35		18:23			16:24	23	09:48 (WEA10)	16:04	17	10:06 (WEA13)
19	05:18		06:09		07:03		07:57			07:56		09:25 (WEA10)	08:38		09:50 (WEA13)
	21:43		20:46		19:33		18:21			16:22	23	09:48 (WEA10)	16:05	17	10:07 (WEA13)
20	05:19		06:10		07:05		07:59			07:58		09:26 (WEA10)	08:38		09:51 (WEA13)
	21:41		20:44		19:30		18:19			16:21	22	09:48 (WEA10)	16:05	16	10:07 (WEA13)
21	05:21		06:12		07:07		08:01			08:00		09:27 (WEA10)	08:39		09:51 (WEA13)
	21:40		20:42		19:28		18:16			16:20	21	09:48 (WEA10)	16:05	16	10:07 (WEA13)
22	05:22		06:14		07:08		08:03			08:02		09:27 (WEA10)	08:39		09:52 (WEA13)
	21:39		20:40		19:25		18:14			16:18	21	09:48 (WEA10)	16:06	16	10:08 (WEA13)
23	05:23		06:16		07:10		08:05		09:13 (WEA11)	08:04		09:28 (WEA10)	08:40		09:52 (WEA13)
	21:37		20:38		19:23		18:12	9	09:22 (WEA11)	16:17	19	09:47 (WEA10)	16:06	16	10:08 (WEA13)
24	05:25		06:17		07:12		08:07		09:12 (WEA11)	08:05		09:30 (WEA10)	08:40		09:52 (WEA13)
	21:36		20:35		19:20		18:10	12	09:24 (WEA11)	16:16	17	09:47 (WEA10)	16:07	16	10:08 (WEA13)
25	05:27		06:19		07:14		07:09		08:10 (WEA11)	08:07		09:31 (WEA10)	08:41		09:53 (WEA13)
	21:34		20:33		19:18		17:08	14	08:24 (WEA11)	16:15	16	09:47 (WEA10)	16:08	17	10:10 (WEA13)
26	05:28		06:21		07:15		07:11		08:10 (WEA11)	08:09		09:31 (WEA10)	08:41		09:53 (WEA13)
	21:33		20:31		19:15		17:05	15	08:25 (WEA11)	16:14	14	09:45 (WEA10)	16:08	17	10:10 (WEA13)
27	05:30		06:23		07:17		07:13		08:09 (WEA11)	08:10		09:33 (WEA10)	08:41		09:54 (WEA13)
	21:31		20:28		19:13		17:03	16	08:25 (WEA11)	16:13	11	09:44 (WEA10)	16:09	16	10:10 (WEA13)
28	05:31		06:25		07:19		07:14		08:09 (WEA11)	08:12		09:36 (WEA10)	08:41		09:54 (WEA13)
	21:29		20:26		19:11		17:01	16	08:25 (WEA11)	16:12	10	09:51 (WEA13)	16:10	17	10:11 (WEA13)
29	05:33		06:26		07:21		07:16		08:09 (WEA11)	08:14		09:46 (WEA13)	08:42		09:54 (WEA13)
	21:28		20:24		19:08		16:59	16	08:25 (WEA11)	16:11	8	09:54 (WEA13)	16:11	17	10:11 (WEA13)
30	05:34		06:28		07:23		07:18		08:09 (WEA11)	08:15		09:46 (WEA13)	08:42		09:55 (WEA13)
	21:26		20:21		19:06		16:57	15	08:24 (WEA11)	16:10	9	09:55 (WEA13)	16:12	17	10:12 (WEA13)
31	05:36		06:30				07:20		08:10 (WEA11)				08:42		09:56 (WEA13)
	21:24		20:19				16:55	13	08:23 (WEA11)				16:13	16	10:12 (WEA13)
Sonnenscheinstunden	511		459		382		329			260			234		
astr.max.mögl.Beschattung								126			476			497	
Red.Sonnenscheinwahrsch.								0,29			0,19			0,14	
Reduktion Betriebsdauer								0,97			0,97			0,97	
Reduktion Windrichtung								0,62			0,60			0,61	
Gesamte Reduktion								0,17			0,11			0,08	
Met.wahrsch.Beschattung								22			54			41	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP10 - Falkenhorst 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:42	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:54	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:51	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:36
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:42	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:38
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:39	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:48	17:48	18:41	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP11 - Auf dem Kampen 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP12 - Auf dem Kampen 6, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP13 - Auf dem Kampen 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP14 - Heinrich-Evers-Straße 4A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP15 - Heinrich-Evers-Straße 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP16 - Kleiner Köven 15A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:37	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	04:59	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:07
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:42	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:58	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:56	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:06	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:04
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:25	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:54	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:29	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:53	05:16	06:07	07:01	07:55	07:54	08:37
	16:38	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:23	16:04
19	08:30	07:37	06:31	06:17	05:18	04:53	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:42	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:47	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:11
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:12
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP17 - An der Gösche 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:12
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP18 - Wischhofstraße 17a, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP19 - Wischhofstraße 15, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP20 - Wischhofstraße 13, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP21 - Auf der Stroth 18, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP22 - Auf der Stroth 24, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP23 - Auf der Stroth 20, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP24 - Auf der Stroth 23, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP25 - Auf der Stroth 21, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP26 - Auf der Stroth 25, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP27 - Strother Heuweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP28 - Strother Heuweg 9, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:14	20:11	21:05	21:50	21:54	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP29 - Birkenweg 11, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP30 - Pappelweg 7, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP31 - Jochensweg 8, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP32 - Driftweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:38	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:27	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53	08:36
	16:37	17:37	18:30	20:28	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:08
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:30	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP33 - Horn 23, 21769 Armstorf

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:40	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:09
3	08:41	08:08	07:10	06:55	05:47	05:01	05:00	05:41	06:35	07:28	07:26	08:20
	16:17	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:02	05:45	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:46	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:03	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:08	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:46	05:39	04:58	05:03	05:48	06:42	07:35	07:34	08:25
	16:22	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:38	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:36	04:56	05:06	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:07	05:53	06:47	07:41	07:40	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:37	16:05
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:04	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:57	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:19	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:31	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:48	18:35	16:32	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:13	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:04	06:58	07:52	07:51	08:35
	16:36	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:17	06:07	07:01	07:56	07:55	08:37
	16:39	17:39	18:33	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:05
19	08:30	07:37	06:32	06:17	05:19	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:23	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:11	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:16	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:06
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:19	16:06
23	08:25	07:28	06:22	06:08	05:13	04:55	05:24	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:38	19:23	18:12	16:17	16:07
24	08:24	07:26	06:20	06:06	05:11	04:55	05:25	06:18	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:41	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:46	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:56	05:28	06:21	07:16	07:11	08:09	08:41
	16:54	17:55	18:47	20:44	21:35	21:58	21:33	20:31	19:16	17:06	16:14	16:09
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:57	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:58	05:07	04:57	05:31	06:25	07:19	07:15	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:56	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:35	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:57		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP34 - Sticht 3, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42		09:29 (WEA12)	08:12		08:52 (WEA13)	07:15	07:00	05:51	05:02
	16:14	2	09:31 (WEA12)	17:05	10	09:02 (WEA13)	18:00	19:58	20:53	21:43
2	08:41		09:28 (WEA12)	08:10		08:53 (WEA13)	07:12	06:58	05:49	05:01
	16:15	5	09:33 (WEA12)	17:07	10	09:03 (WEA13)	18:02	20:00	20:55	21:44
3	08:41		09:28 (WEA12)	08:08		08:54 (WEA13)	07:10	06:55	05:47	05:00
	16:16	7	09:35 (WEA12)	17:09	8	09:02 (WEA13)	18:04	20:02	20:57	21:45
4	08:41		09:28 (WEA12)	08:07		08:56 (WEA13)	07:08	06:53	05:45	05:00
	16:18	7	09:35 (WEA12)	17:11	4	09:00 (WEA13)	18:06	20:04	20:59	21:46
5	08:41		09:28 (WEA12)	08:05			07:05	06:50	05:43	04:59
	16:19	9	09:37 (WEA12)	17:13			18:08	20:06	21:00	21:47
6	08:40		09:28 (WEA12)	08:03			07:03	06:48	05:41	04:58
	16:20	10	09:38 (WEA12)	17:15			18:10	20:08	21:02	21:48
7	08:40		09:28 (WEA12)	08:01			07:01	06:45	05:39	04:57
	16:21	11	09:39 (WEA12)	17:17			18:12	20:09	21:04	21:49
8	08:39		09:28 (WEA12)	07:59			06:58	06:43	05:37	04:57
	16:23	11	09:39 (WEA12)	17:19			18:14	20:11	21:06	21:50
9	08:39		09:28 (WEA12)	07:57			06:56	06:41	05:35	04:56
	16:24	12	09:40 (WEA12)	17:21			18:16	20:13	21:08	21:51
10	08:38		09:28 (WEA12)	07:55		08:34 (WEA10)	06:53	06:38	05:34	04:56
	16:26	12	09:40 (WEA12)	17:23	4	08:38 (WEA10)	18:18	20:15	21:09	21:52
11	08:37		09:28 (WEA12)	07:53		08:32 (WEA10)	06:51	06:36	05:32	04:55
	16:27	13	09:41 (WEA12)	17:25	8	08:40 (WEA10)	18:19	20:17	21:11	21:53
12	08:37		09:28 (WEA12)	07:51		08:31 (WEA10)	06:49	06:34	05:30	04:55
	16:29	13	09:41 (WEA12)	17:27	11	08:42 (WEA10)	18:21	20:19	21:13	21:54
13	08:36		09:28 (WEA12)	07:49		08:29 (WEA10)	06:46	06:31	05:28	04:55
	16:30	14	09:42 (WEA12)	17:29	12	08:41 (WEA10)	18:23	20:20	21:14	21:54
14	08:35		09:29 (WEA12)	07:47		08:29 (WEA10)	06:44	06:29	05:27	04:54
	16:32	13	09:42 (WEA12)	17:31	13	08:42 (WEA10)	18:25	20:22	21:16	21:55
15	08:34		09:30 (WEA12)	07:45		08:29 (WEA10)	06:41	06:27	05:25	04:54
	16:34	12	09:42 (WEA12)	17:33	13	08:42 (WEA10)	18:27	20:24	21:18	21:56
16	08:33		09:30 (WEA12)	07:43		08:30 (WEA10)	06:39	06:24	05:23	04:54
	16:35	13	09:43 (WEA12)	17:35	12	08:42 (WEA10)	18:29	20:26	21:19	21:56
17	08:32		09:31 (WEA12)	07:41		08:31 (WEA10)	06:37	06:22	05:22	04:54
	16:37	12	09:43 (WEA12)	17:37	10	08:41 (WEA10)	18:31	20:28	21:21	21:57
18	08:31		09:32 (WEA12)	07:39		08:31 (WEA10)	06:34	06:20	05:20	04:54
	16:39	11	09:43 (WEA12)	17:39	8	08:39 (WEA10)	18:33	20:30	21:23	21:57
19	08:30		09:33 (WEA12)	07:37			06:32	06:17	05:18	04:54
	16:41	9	09:42 (WEA12)	17:41			18:34	20:31	21:24	21:58
20	08:29		09:35 (WEA12)	07:35			06:29	06:15	05:17	04:54
	16:42	6	09:41 (WEA12)	17:43			18:36	20:33	21:26	21:58
21	08:28			07:33			06:27	06:13	05:15	04:54
	16:44			17:45			18:38	20:35	21:27	21:58
22	08:26			07:30			06:24	06:11	05:14	04:54
	16:46			17:47			18:40	20:37	21:29	21:58
23	08:25			07:28			06:22	06:08	05:13	04:54
	16:48			17:49			18:42	20:39	21:31	21:58
24	08:24			07:26			06:19	06:06	05:11	04:55
	16:50			17:51			18:44	20:41	21:32	21:59
25	08:22			07:24			06:17	06:04	05:10	04:55
	16:52			17:53			18:45	20:42	21:33	21:59
26	08:21			07:21			06:15	06:02	05:09	04:55
	16:53			17:55			18:47	20:44	21:35	21:59
27	08:20		08:54 (WEA13)	07:19			06:12	06:00	05:08	04:56
	16:55	5	08:59 (WEA13)	17:56			18:49	20:46	21:36	21:58
28	08:18		08:52 (WEA13)	07:17			06:10	05:58	05:06	04:56
	16:57	8	09:00 (WEA13)	17:58			18:51	20:48	21:38	21:58
29	08:17		08:52 (WEA13)				07:07	05:55	05:05	04:57
	16:59	10	09:02 (WEA13)				19:53	20:50	21:39	21:58
30	08:15		08:52 (WEA13)				07:05	05:53	05:04	04:58
	17:01	10	09:02 (WEA13)				19:55	20:51	21:40	21:58
31	08:13		08:52 (WEA13)				07:02		05:03	
	17:03	10	09:02 (WEA13)				19:57		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		245			123					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,97			0,97					
Reduktion Windrichtung		0,60			0,62					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		24			17					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP34 - Sticht 3, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November			Dezember		
1	04:58		05:38		06:32		07:24		07:22		08:04 (WEA10)	08:17		09:10 (WEA12)
	21:58		21:23		20:17		19:03		16:53	3	08:07 (WEA10)	16:09	13	09:23 (WEA12)
2	04:59		05:39		06:33		07:26		07:24			08:18		09:11 (WEA12)
	21:57		21:21		20:14		19:01		16:51			16:08	13	09:24 (WEA12)
3	05:00		05:41		06:35		07:28		07:26			08:20		09:12 (WEA12)
	21:57		21:19		20:12		18:58		16:49			16:08	12	09:24 (WEA12)
4	05:01		05:43		06:37		07:30		07:28			08:21		09:12 (WEA12)
	21:56		21:17		20:09		18:56		16:47			16:07	12	09:24 (WEA12)
5	05:01		05:44		06:39		07:32		07:30			08:23		09:13 (WEA12)
	21:56		21:15		20:07		18:54		16:45			16:07	11	09:24 (WEA12)
6	05:02		05:46		06:40		07:33		07:32			08:24		09:14 (WEA12)
	21:55		21:13		20:05		18:51		16:44			16:06	10	09:24 (WEA12)
7	05:03		05:48		06:42		07:35		07:34		08:25 (WEA13)	08:25		09:14 (WEA12)
	21:55		21:12		20:02		18:49		16:42	5	08:30 (WEA13)	16:06	9	09:23 (WEA12)
8	05:04		05:50		06:44		07:37		07:36		08:24 (WEA13)	08:27		09:16 (WEA12)
	21:54		21:10		20:00		18:46		16:40	8	08:32 (WEA13)	16:05	8	09:24 (WEA12)
9	05:05		05:51		06:46		07:39		07:38		08:23 (WEA13)	08:28		09:16 (WEA12)
	21:53		21:08		19:57		18:44		16:38	10	08:33 (WEA13)	16:05	7	09:23 (WEA12)
10	05:06		05:53		06:47		07:41		07:40		08:23 (WEA13)	08:29		09:17 (WEA12)
	21:52		21:06		19:55		18:42		16:36	10	08:33 (WEA13)	16:04	5	09:22 (WEA12)
11	05:08		05:55		06:49		07:43		07:41		08:24 (WEA13)	08:30		09:20 (WEA12)
	21:51		21:04		19:52		18:39		16:35	10	08:34 (WEA13)	16:04	2	09:22 (WEA12)
12	05:09		05:56		06:51		07:44		07:43		08:24 (WEA13)	08:31		
	21:50		21:01		19:50		18:37		16:33	10	08:34 (WEA13)	16:04		
13	05:10		05:58		06:53		07:46		07:45		08:24 (WEA13)	08:32		
	21:50		20:59		19:48		18:35		16:31	10	08:34 (WEA13)	16:04		
14	05:11		06:00		06:54		07:48		07:47		08:25 (WEA13)	08:33		
	21:48		20:57		19:45		18:32		16:30	8	08:33 (WEA13)	16:04		
15	05:12		06:02		06:56		07:50		07:49		08:27 (WEA13)	08:34		
	21:47		20:55		19:43		18:30		16:28	5	08:32 (WEA13)	16:04		
16	05:14		06:03		06:58		07:52		07:51			08:35		
	21:46		20:53		19:40		18:28		16:27			16:04		
17	05:15		06:05		07:00		07:54		07:53			08:36		
	21:45		20:51		19:38		18:25		16:25			16:04		
18	05:16		06:07		07:01		07:56		07:55			08:37		
	21:44		20:49		19:35		18:23		16:24			16:04		
19	05:18		06:09		07:03		07:57		07:56			08:38		
	21:43		20:47		19:33		18:21		16:22			16:05		
20	05:19		06:10		07:05		07:59		07:58			08:38		
	21:41		20:44		19:30		18:19		16:21			16:05		
21	05:21		06:12		07:07		08:01		08:00			08:39		
	21:40		20:42		19:28		18:16		16:20			16:05		
22	05:22		06:14		07:08		08:03		08:02		09:11 (WEA12)	08:39		
	21:39		20:40		19:25		18:14		16:18	6	09:17 (WEA12)	16:06		
23	05:24		06:16		07:10		08:05		09:04 (WEA10)	08:04	09:10 (WEA12)	08:40		
	21:37		20:38		19:23		18:12	3	09:07 (WEA10)	16:17	9 09:19 (WEA12)	16:06		
24	05:25		06:18		07:12		08:07		09:01 (WEA10)	08:05	09:09 (WEA12)	08:40		
	21:36		20:35		19:20		18:10	9	09:10 (WEA10)	16:16	11 09:20 (WEA12)	16:07		
25	05:27		06:19		07:14		07:09		08:00 (WEA10)	08:07	09:09 (WEA12)	08:41		
	21:34		20:33		19:18		17:08	11	08:11 (WEA10)	16:15	12 09:21 (WEA12)	16:08		
26	05:28		06:21		07:16		07:11		07:59 (WEA10)	08:09	09:08 (WEA12)	08:41		
	21:33		20:31		19:16		17:06	12	08:11 (WEA10)	16:14	13 09:21 (WEA12)	16:08		
27	05:30		06:23		07:17		07:13		07:59 (WEA10)	08:10	09:09 (WEA12)	08:41		
	21:31		20:28		19:13		17:03	12	08:11 (WEA10)	16:13	13 09:22 (WEA12)	16:09		
28	05:31		06:25		07:19		07:15		07:59 (WEA10)	08:12	09:09 (WEA12)	08:41		
	21:30		20:26		19:11		17:01	12	08:11 (WEA10)	16:12	13 09:22 (WEA12)	16:10		
29	05:33		06:26		07:21		07:16		07:59 (WEA10)	08:14	09:10 (WEA12)	08:42		
	21:28		20:24		19:08		16:59	12	08:11 (WEA10)	16:11	13 09:23 (WEA12)	16:11		
30	05:34		06:28		07:23		07:18		07:59 (WEA10)	08:15	09:10 (WEA12)	08:42		
	21:26		20:21		19:06		16:57	11	08:10 (WEA10)	16:10	13 09:23 (WEA12)	16:12		
31	05:36		06:30				07:20		08:00 (WEA10)			08:42		
	21:24		20:19				16:55	9	08:09 (WEA10)			16:13		
Sonnenscheinstunden	511		459		382		329			260		234		
astr.max.mögl.Beschattung								91			182			102
Red.Sonnenscheinwahrsch.								0,29			0,19			0,14
Reduktion Betriebsdauer								0,97			0,97			0,97
Reduktion Windrichtung								0,62			0,60			0,60
Gesamte Reduktion								0,17			0,11			0,08
Met.wahrsch.Beschattung								16			20			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP35 - Neues Moor 19, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:43	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:55	08:37
	16:39	17:39	18:32	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38
	16:40	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:20	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:23	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:59	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:59	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:07	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:56		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:41			08:12		15:45 (WEA11)	07:14	07:00	05:51	05:02
	16:14			17:05	14	15:59 (WEA11)	18:00	19:58	20:53	21:43
2	08:41			08:10		15:46 (WEA11)	07:12	06:57	05:49	05:01
	16:15			17:07	13	15:59 (WEA11)	18:02	20:00	20:55	21:44
3	08:41			08:08		15:47 (WEA11)	07:10	06:55	05:47	05:00
	16:16			17:09	11	15:58 (WEA11)	18:04	20:02	20:57	21:45
4	08:41			08:06		15:50 (WEA11)	07:08	06:53	05:45	04:59
	16:17			17:11	7	15:57 (WEA11)	18:06	20:04	20:59	21:46
5	08:41			08:05			07:05	06:50	05:43	04:59
	16:19			17:13			18:08	20:06	21:00	21:47
6	08:40			08:03			07:03	06:48	05:41	04:58
	16:20			17:15			18:10	20:07	21:02	21:48
7	08:40			08:01			07:00	06:45	05:39	04:57
	16:21			17:17			18:12	20:09	21:04	21:49
8	08:39			07:59			06:58	06:43	05:37	04:57
	16:23			17:19			18:14	20:11	21:06	21:50
9	08:39			07:57			06:56	06:41	05:35	04:56
	16:24			17:21			18:16	20:13	21:07	21:51
10	08:38			07:55		16:44 (WEA10)	06:53	06:38	05:34	04:56
	16:26			17:23	5	16:49 (WEA10)	18:17	20:15	21:09	21:52
11	08:37			07:53		16:41 (WEA10)	06:51	06:36	05:32	04:55
	16:27			17:25	9	16:50 (WEA10)	18:19	20:17	21:11	21:53
12	08:37			07:51		16:40 (WEA10)	06:49	06:33	05:30	04:55
	16:29			17:27	11	16:51 (WEA10)	18:21	20:18	21:13	21:54
13	08:36			07:49		16:40 (WEA10)	06:46	06:31	05:28	04:54
	16:30			17:29	12	16:52 (WEA10)	18:23	20:20	21:14	21:54
14	08:35		15:47 (WEA13)	07:47		16:40 (WEA10)	06:44	06:29	05:26	04:54
	16:32	5	15:52 (WEA13)	17:31	12	16:52 (WEA10)	18:25	20:22	21:16	21:55
15	08:34		15:46 (WEA13)	07:45		16:40 (WEA10)	06:41	06:26	05:25	04:54
	16:34	8	15:54 (WEA13)	17:33	12	16:52 (WEA10)	18:27	20:24	21:18	21:56
16	08:33		15:46 (WEA13)	07:43		16:41 (WEA10)	06:39	06:24	05:23	04:54
	16:35	9	15:55 (WEA13)	17:35	10	16:51 (WEA10)	18:29	20:26	21:19	21:56
17	08:32		15:46 (WEA13)	07:41		16:42 (WEA10)	06:36	06:22	05:21	04:54
	16:37	10	15:56 (WEA13)	17:37	9	16:51 (WEA10)	18:31	20:28	21:21	21:57
18	08:31		15:45 (WEA13)	07:39		16:44 (WEA10)	06:34	06:20	05:20	04:54
	16:39	11	15:56 (WEA13)	17:39	3	16:47 (WEA10)	18:32	20:29	21:23	21:57
19	08:30		15:45 (WEA13)	07:37			06:32	06:17	05:18	04:54
	16:40	12	15:57 (WEA13)	17:41			18:34	20:31	21:24	21:57
20	08:29		15:46 (WEA13)	07:35			06:29	06:15	05:17	04:54
	16:42	12	15:58 (WEA13)	17:43			18:36	20:33	21:26	21:58
21	08:28		15:46 (WEA13)	07:32			06:27	06:13	05:15	04:54
	16:44	12	15:58 (WEA13)	17:45			18:38	20:35	21:27	21:58
22	08:26		15:46 (WEA11)	07:30			06:24	06:10	05:14	04:54
	16:46	12	15:58 (WEA13)	17:47			18:40	20:37	21:29	21:58
23	08:25		15:45 (WEA11)	07:28			06:22	06:08	05:13	04:54
	16:48	12	15:57 (WEA13)	17:49			18:42	20:39	21:30	21:58
24	08:24		15:44 (WEA11)	07:26			06:19	06:06	05:11	04:55
	16:49	14	15:58 (WEA13)	17:50			18:44	20:40	21:32	21:58
25	08:22		15:44 (WEA11)	07:24			06:17	06:04	05:10	04:55
	16:51	14	15:58 (WEA11)	17:52			18:45	20:42	21:33	21:58
26	08:21		15:44 (WEA11)	07:21			06:14	06:02	05:09	04:55
	16:53	15	15:59 (WEA11)	17:54			18:47	20:44	21:35	21:58
27	08:19		15:43 (WEA11)	07:19			06:12	06:00	05:07	04:56
	16:55	16	15:59 (WEA11)	17:56			18:49	20:46	21:36	21:58
28	08:18		15:43 (WEA11)	07:17			06:10	05:57	05:06	04:56
	16:57	16	15:59 (WEA11)	17:58			18:51	20:48	21:38	21:58
29	08:16		15:44 (WEA11)				07:07	05:55	05:05	04:57
	16:59	16	16:00 (WEA11)				19:53	20:50	21:39	21:58
30	08:15		15:44 (WEA11)				07:05	05:53	05:04	04:57
	17:01	16	16:00 (WEA11)				19:55	20:51	21:40	21:58
31	08:13		15:44 (WEA11)				07:02		05:03	
	17:03	16	16:00 (WEA11)				19:56		21:41	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		226			128					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,97			0,97					
Reduktion Windrichtung		0,67			0,67					
Gesamte Reduktion		0,11			0,16					
Met.wahrsch.Beschattung		25			20					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober			November			Dezember
1	04:58	05:38	06:31	07:24			07:22		16:13 (WEA10)	08:17
	21:57	21:23	20:16	19:03			16:53	4	16:17 (WEA10)	16:09
2	04:59	05:39	06:33	07:26			07:24			08:18
	21:57	21:21	20:14	19:01			16:51			16:08
3	05:00	05:41	06:35	07:28			07:26			08:20
	21:57	21:19	20:12	18:58			16:49			16:08
4	05:00	05:43	06:37	07:30			07:28			08:21
	21:56	21:17	20:09	18:56			16:47			16:07
5	05:01	05:44	06:38	07:31			07:30			08:23
	21:56	21:15	20:07	18:53			16:45			16:06
6	05:02	05:46	06:40	07:33			07:32			08:24
	21:55	21:13	20:04	18:51			16:43			16:06
7	05:03	05:48	06:42	07:35			07:34		15:19 (WEA11)	08:25
	21:54	21:11	20:02	18:49			16:42	8	15:27 (WEA11)	16:05
8	05:04	05:49	06:44	07:37			07:36		15:18 (WEA11)	08:27
	21:54	21:09	20:00	18:46			16:40	10	15:28 (WEA11)	16:05
9	05:05	05:51	06:45	07:39			07:38		15:16 (WEA11)	08:28
	21:53	21:07	19:57	18:44			16:38	14	15:30 (WEA11)	16:05
10	05:06	05:53	06:47	07:41			07:39		15:16 (WEA11)	08:29
	21:52	21:05	19:55	18:42			16:36	14	15:30 (WEA11)	16:04
11	05:07	05:55	06:49	07:42			07:41		15:15 (WEA11)	08:30
	21:51	21:03	19:52	18:39			16:35	16	15:31 (WEA11)	16:04
12	05:09	05:56	06:51	07:44			07:43		15:15 (WEA11)	08:31
	21:50	21:01	19:50	18:37			16:33	16	15:31 (WEA11)	16:04
13	05:10	05:58	06:52	07:46			07:45		15:16 (WEA11)	08:32
	21:49	20:59	19:47	18:34			16:31	16	15:32 (WEA11)	16:04
14	05:11	06:00	06:54	07:48			07:47		15:16 (WEA11)	08:33
	21:48	20:57	19:45	18:32			16:30	16	15:32 (WEA11)	16:04
15	05:12	06:02	06:56	07:50			07:49		15:16 (WEA11)	08:34
	21:47	20:55	19:42	18:30			16:28	16	15:32 (WEA11)	16:04
16	05:14	06:03	06:58	07:52			07:51		15:17 (WEA11)	08:35
	21:46	20:53	19:40	18:28			16:27	15	15:32 (WEA11)	16:04
17	05:15	06:05	06:59	07:54			07:53		15:17 (WEA11)	08:36
	21:45	20:51	19:38	18:25			16:25	15	15:32 (WEA11)	16:04
18	05:16	06:07	07:01	07:55			07:54		15:18 (WEA11)	08:37
	21:44	20:49	19:35	18:23			16:24	14	15:32 (WEA13)	16:04
19	05:18	06:09	07:03	07:57			07:56		15:20 (WEA11)	08:37
	21:43	20:46	19:33	18:21			16:22	12	15:32 (WEA13)	16:05
20	05:19	06:10	07:05	07:59			07:58		15:21 (WEA11)	08:38
	21:41	20:44	19:30	18:18			16:21	12	15:33 (WEA13)	16:05
21	05:20	06:12	07:07	08:01			08:00		15:22 (WEA13)	08:39
	21:40	20:42	19:28	18:16			16:20	12	15:34 (WEA13)	16:05
22	05:22	06:14	07:08	08:03			08:02		15:22 (WEA13)	08:39
	21:39	20:40	19:25	18:14			16:18	12	15:34 (WEA13)	16:06
23	05:23	06:16	07:10	08:05			08:03		15:23 (WEA13)	08:40
	21:37	20:37	19:23	18:12			16:17	11	15:34 (WEA13)	16:06
24	05:25	06:17	07:12	08:07		17:13 (WEA10)	08:05		15:23 (WEA13)	08:40
	21:36	20:35	19:20	18:10	6	17:19 (WEA10)	16:16	11	15:34 (WEA13)	16:07
25	05:26	06:19	07:14	07:09		16:11 (WEA10)	08:07		15:23 (WEA13)	08:41
	21:34	20:33	19:18	17:07	9	16:20 (WEA10)	16:15	10	15:33 (WEA13)	16:08
26	05:28	06:21	07:15	07:11		16:10 (WEA10)	08:09		15:24 (WEA13)	08:41
	21:33	20:31	19:15	17:05	11	16:21 (WEA10)	16:14	9	15:33 (WEA13)	16:08
27	05:30	06:23	07:17	07:12		16:10 (WEA10)	08:10		15:25 (WEA13)	08:41
	21:31	20:28	19:13	17:03	11	16:21 (WEA10)	16:13	8	15:33 (WEA13)	16:09
28	05:31	06:24	07:19	07:14		16:09 (WEA10)	08:12		15:27 (WEA13)	08:41
	21:29	20:26	19:10	17:01	12	16:21 (WEA10)	16:12	5	15:32 (WEA13)	16:10
29	05:33	06:26	07:21	07:16		16:09 (WEA10)	08:14			08:41
	21:28	20:24	19:08	16:59	12	16:21 (WEA10)	16:11			16:11
30	05:34	06:28	07:23	07:18		16:10 (WEA10)	08:15			08:41
	21:26	20:21	19:06	16:57	10	16:20 (WEA10)	16:10			16:12
31	05:36	06:30		07:20		16:11 (WEA10)				08:41
	21:24	20:19		16:55	8	16:19 (WEA10)				16:13
Sonnenscheinstunden	511	459	382	329			260			234
astr.max.mögl.Beschattung					79			276		
Red.Sonnenscheinwahrsch.					0,29			0,19		
Reduktion Betriebsdauer					0,97			0,97		
Reduktion Windrichtung					0,68			0,67		
Gesamte Reduktion					0,19			0,12		
Met.wahrsch.Beschattung					15			34		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Vorbelastung **Schattenrezeptor:** IP37 - Mittelstenaher Str. 32, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:37	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53	08:36
	16:37	17:37	18:30	20:28	21:21	21:57	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:04
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	16:05
21	08:28	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

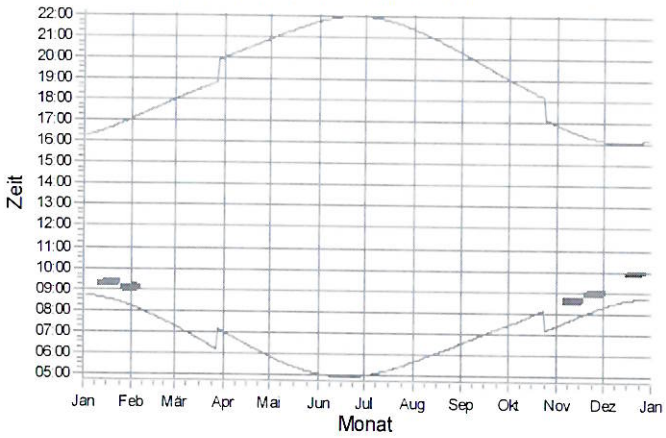
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

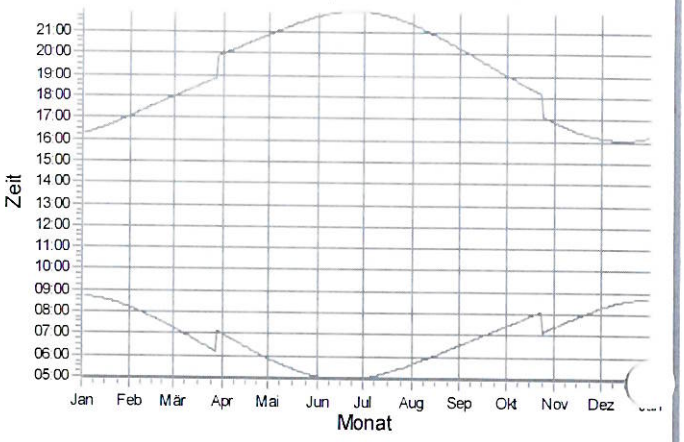
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

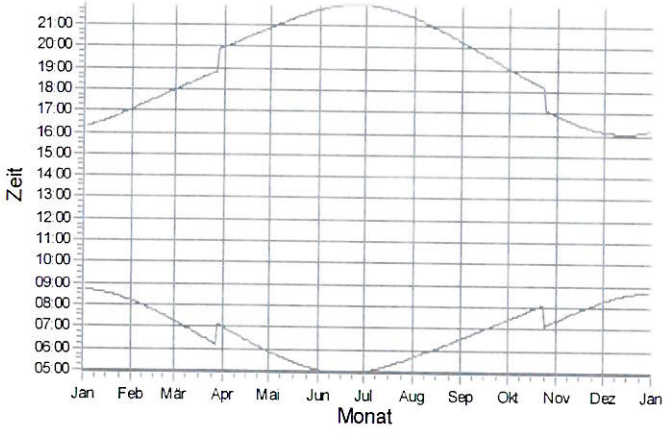
IP01: Sticht 1, 21770 Mittelstenahe



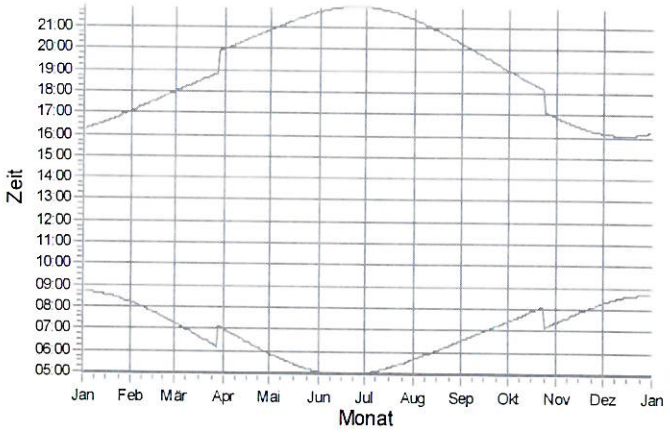
IP02: Neues Moor 21, 21770 Mittelstenahe



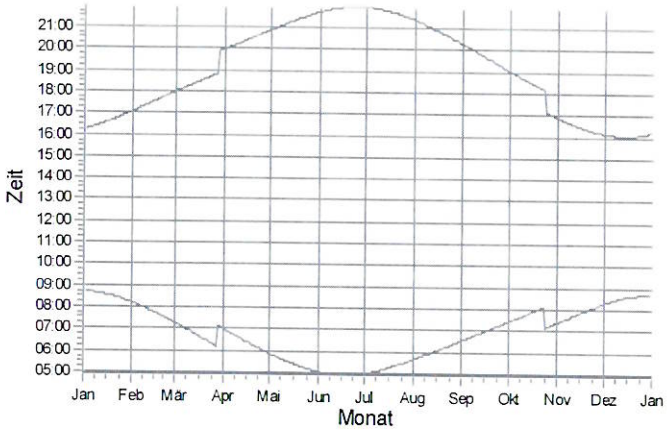
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



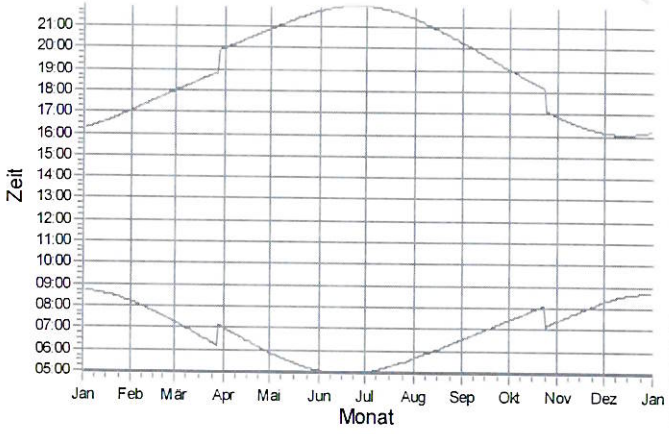
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuweg 5, 21769 Lamstedt



WEA

WEA10: E-70 E4 (M2)
WEA12: E-70 E4 (M5)
WEA13: E-70 E4 (M6)

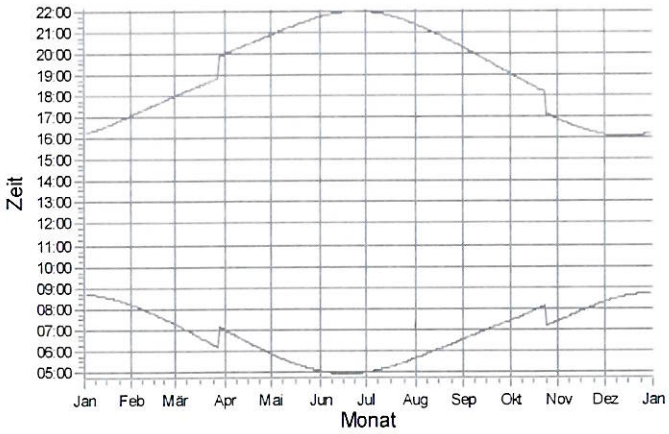
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

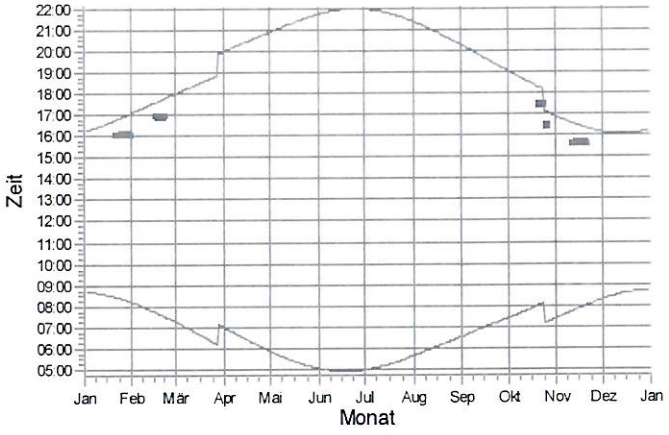
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

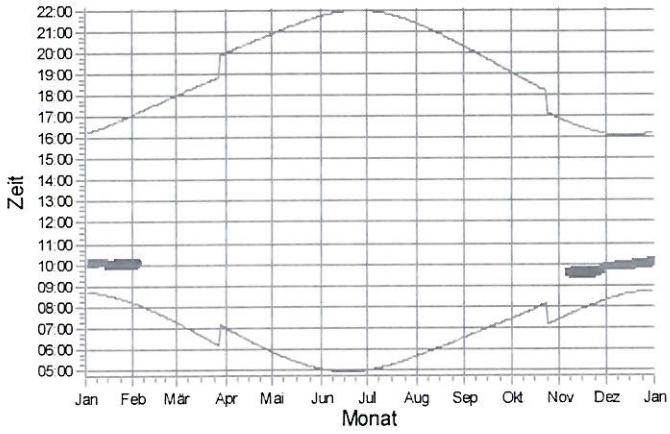
IP07: Driftw eg 2, 21769 Lamstedt



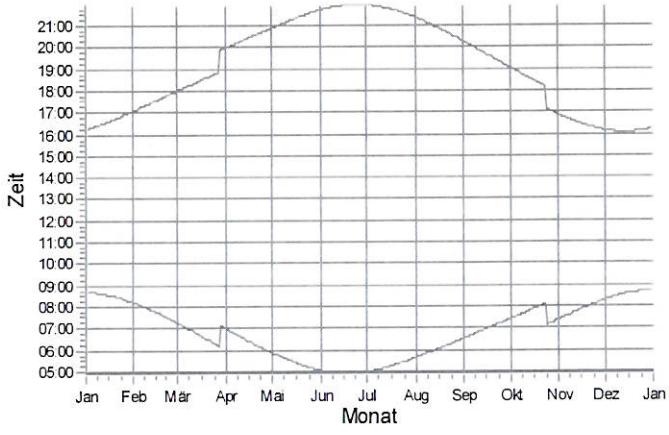
IP08: Hanew orth 1, 21770 Lamstedt



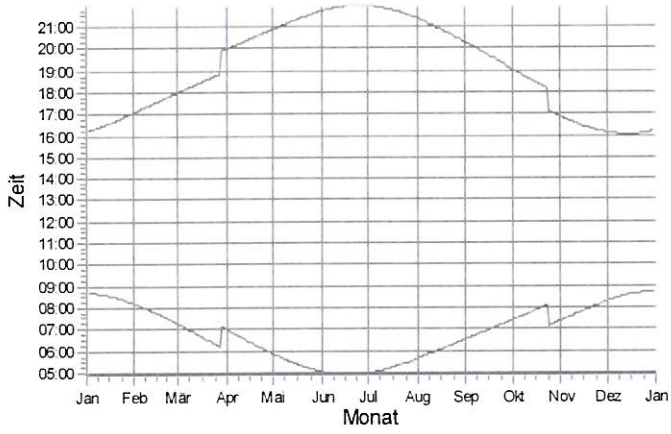
IP09: Sticht 5, 21770 Mittelstenahe



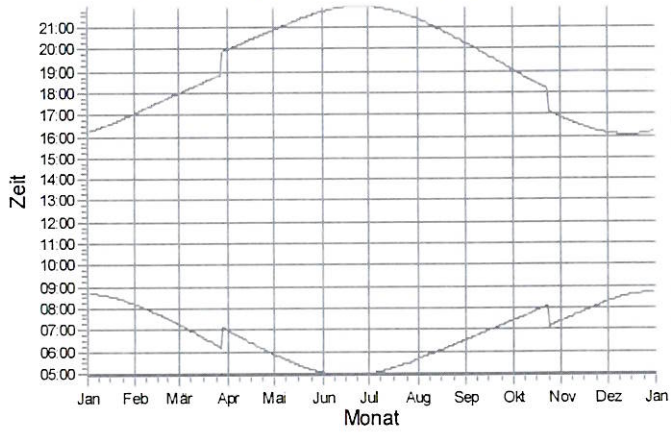
IP10: Falkenhorst 1, 21769 Lamstedt



IP11: Auf dem Kampen 2, 21769 Lamstedt



IP12: Auf dem Kampen 6, 21769 Lamstedt



WEA

WEA10: E-70 E4 (M2)

WEA11: E-70 E4 (M3)

WEA13: E-70 E4 (M6)

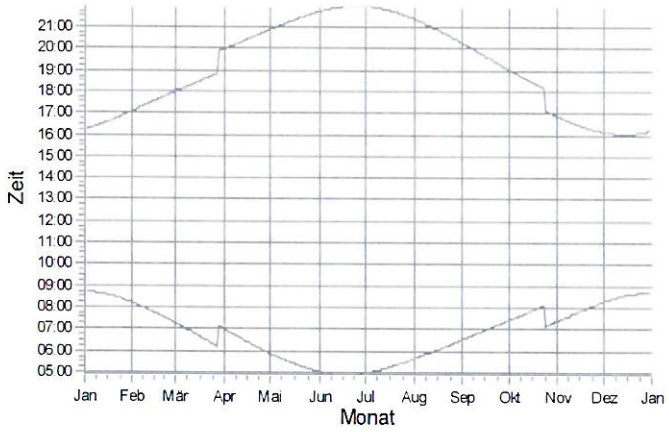
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

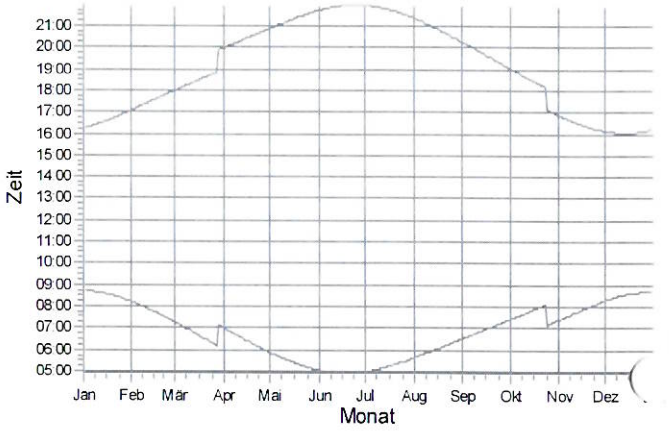
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

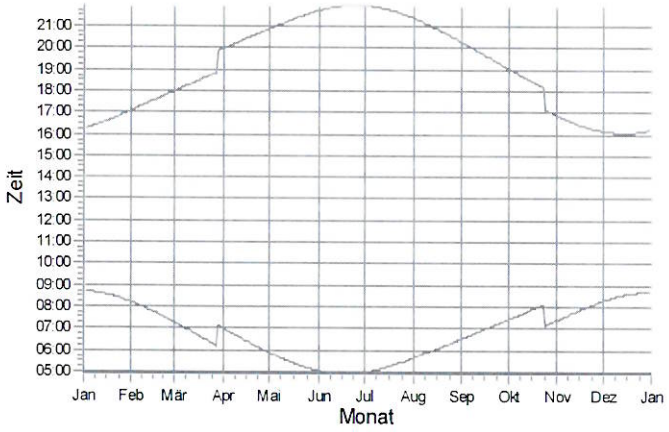
IP13: Auf dem Kampen 5, 21769 Lamstedt



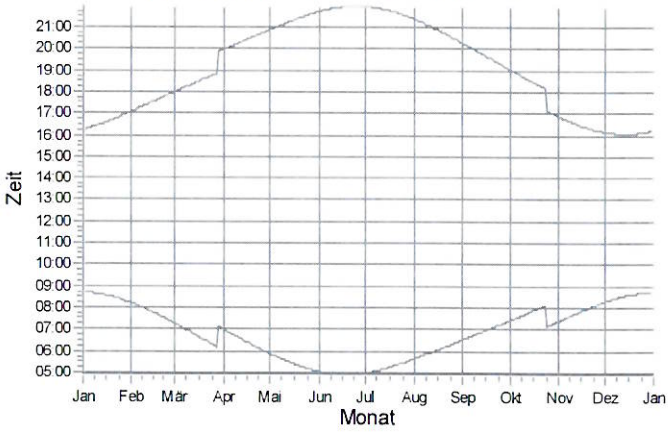
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



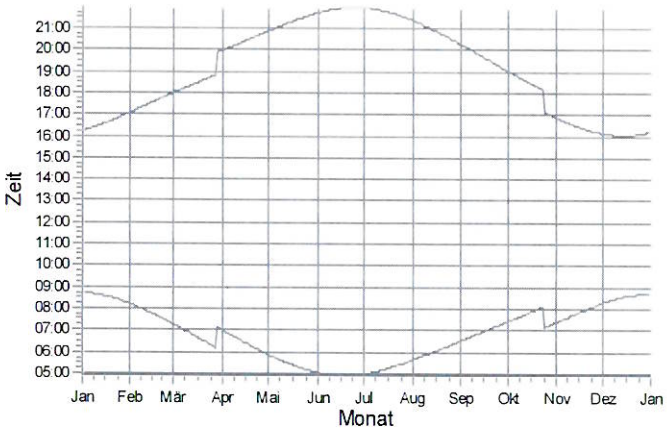
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



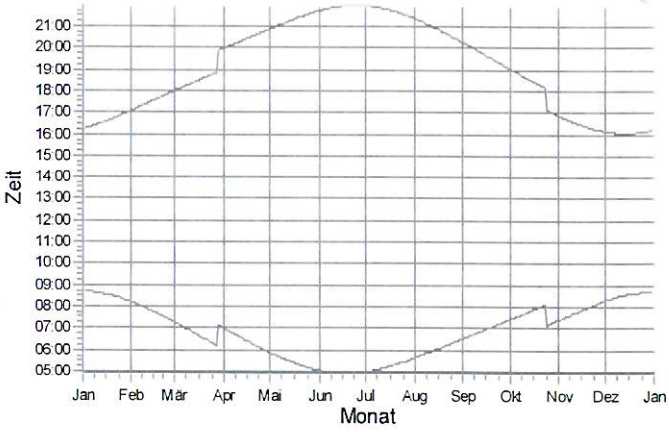
IP16: Kleiner Köven 15A, 21769 Lamstedt



IP17: An der Gösche 10, 21769 Lamstedt



IP18: Wischhofstraße 17a, 21769 Lamstedt



WEA

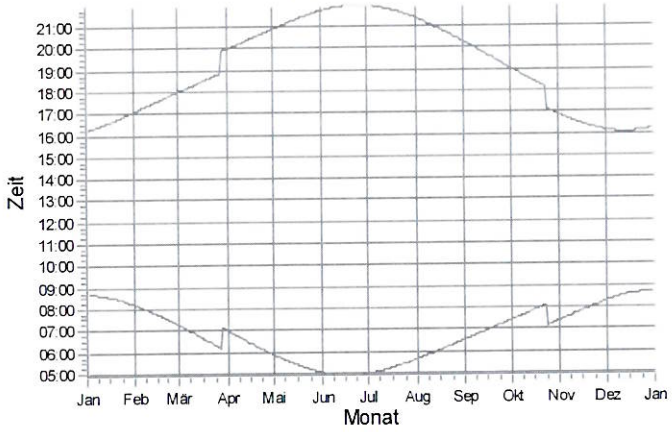
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

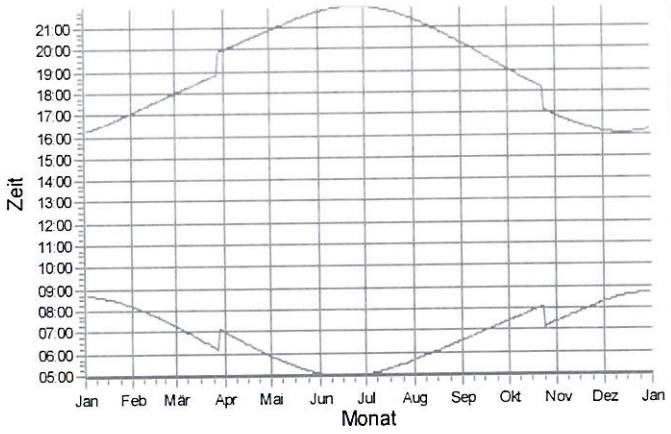
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

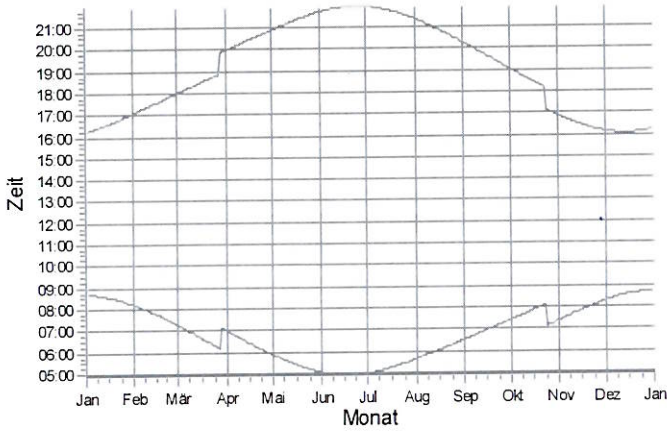
IP19: Wischhofstraße 15, 21769 Lamstedt



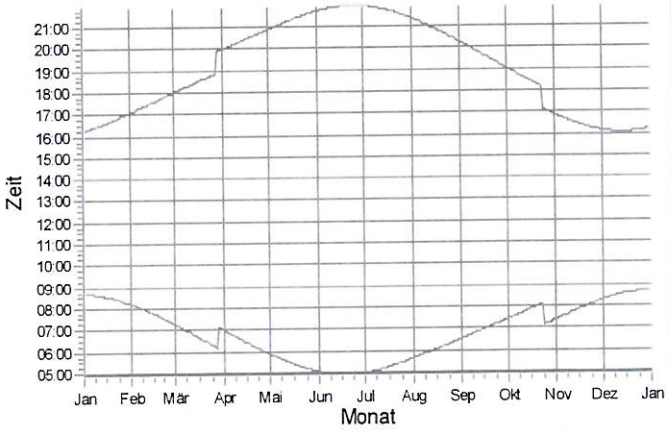
IP20: Wischhofstraße 13, 21769 Lamstedt



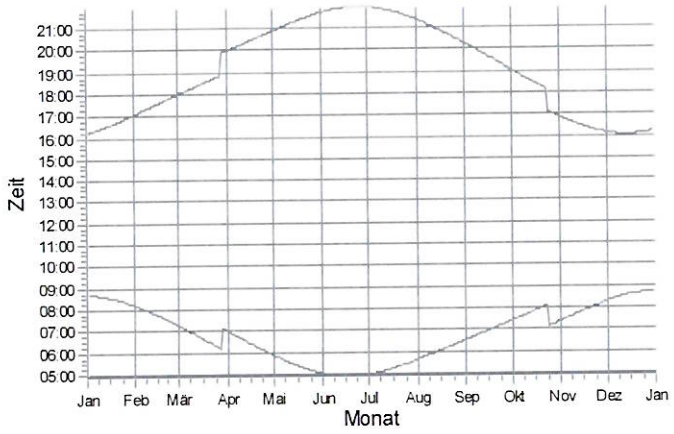
IP21: Auf der Stroth 18, 21769 Lamstedt



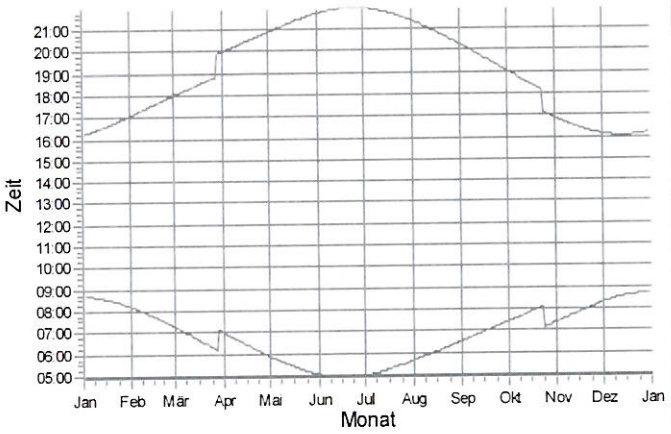
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt



WEA

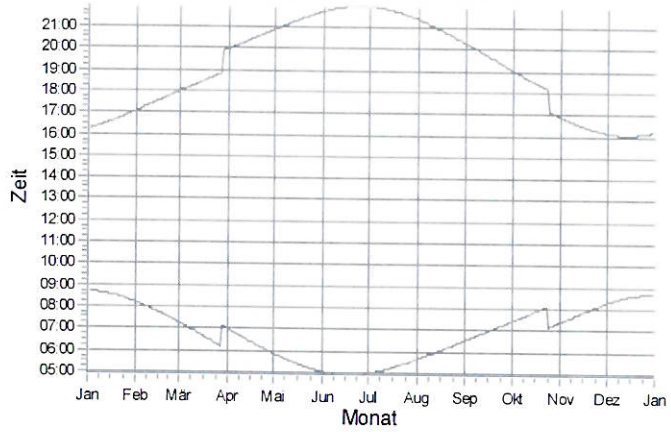
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

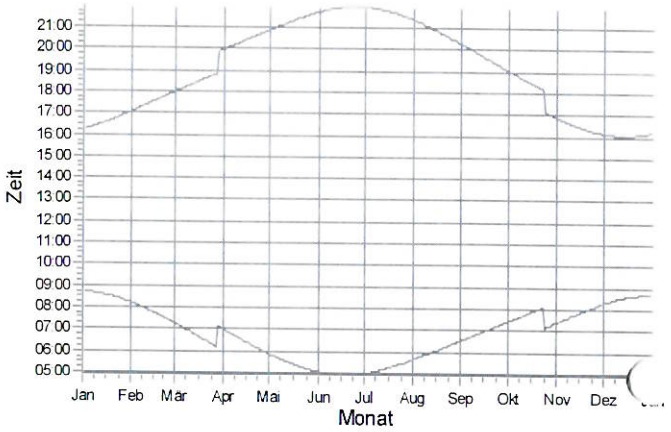
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

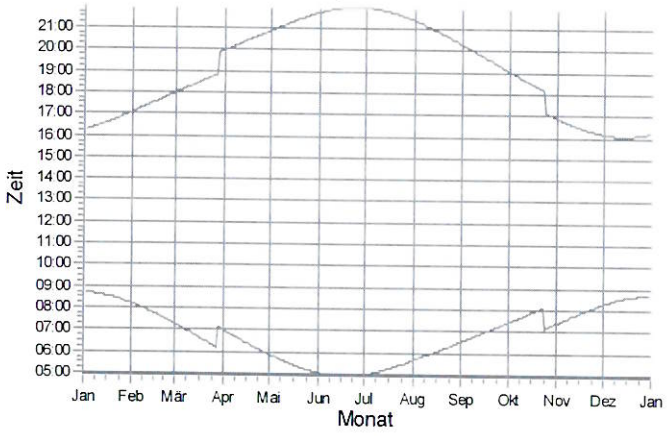
IP25: Auf der Stroth 21, 21769 Lamstedt



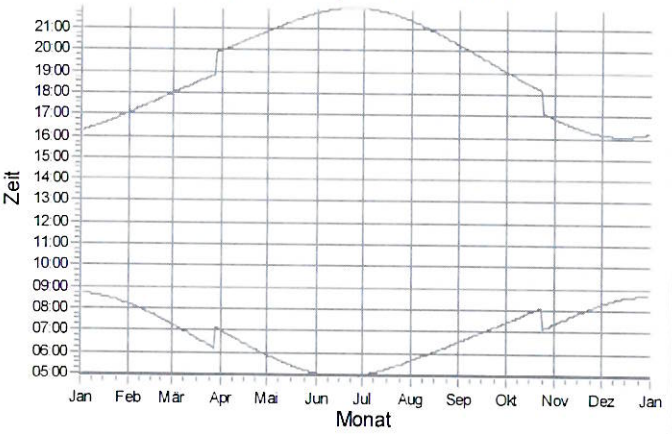
IP26: Auf der Stroth 25, 21769 Lamstedt



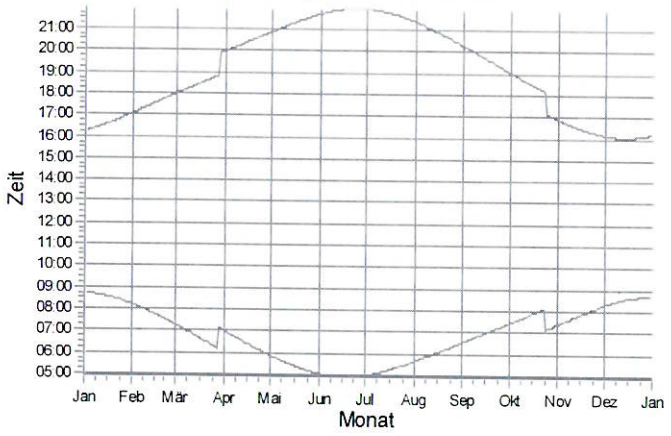
IP27: Strother Heuw eg 1, 21769 Lamstedt



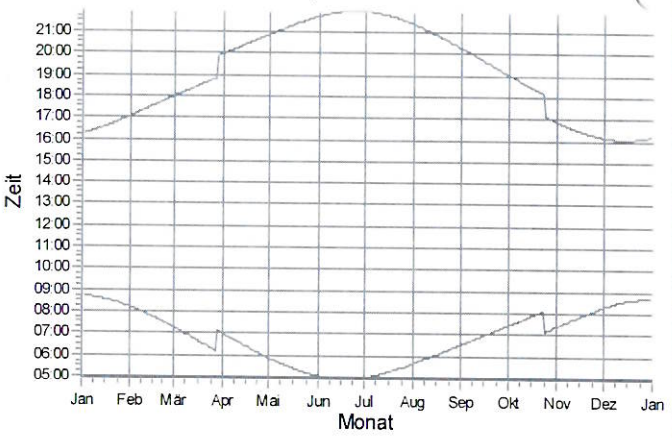
IP28: Strother Heuw eg 9, 21769 Lamstedt



IP29: Birkenw eg 11, 21769 Lamstedt



IP30: Pappelw eg 7, 21769 Lamstedt



WEA

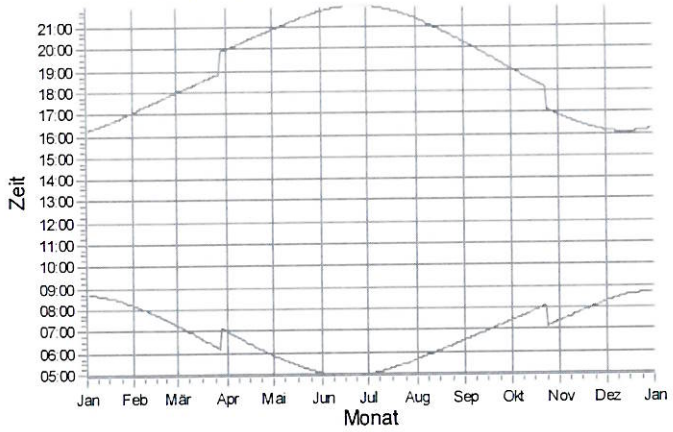
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

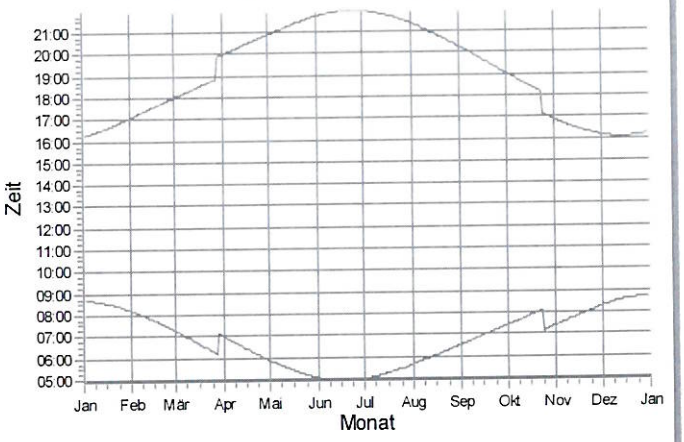
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

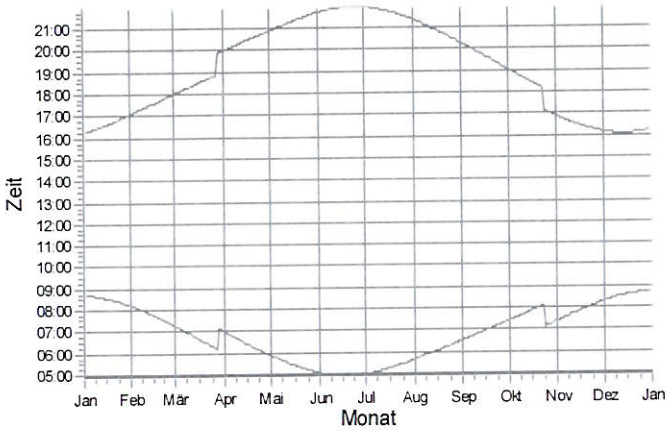
IP31: Jochensweg 8, 21769 Lamstedt



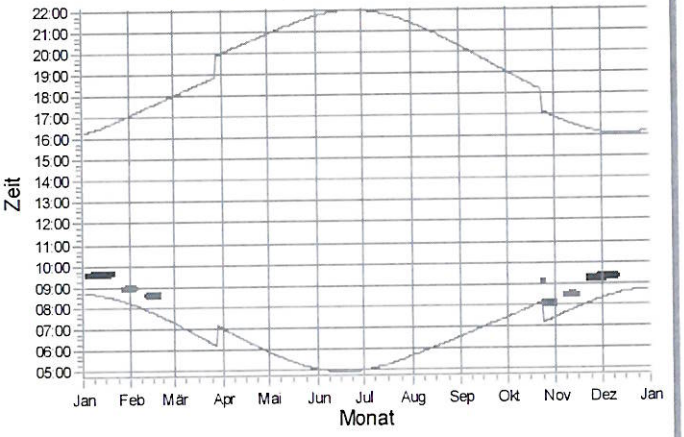
IP32: Driftweg 1, 21769 Lamstedt



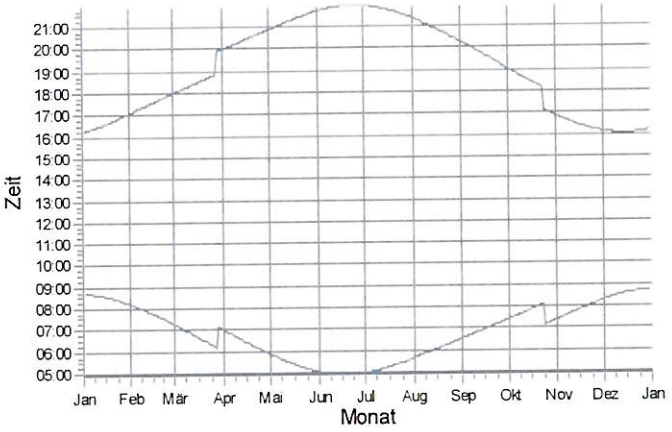
IP33: Horn 23, 21769 Armstorf



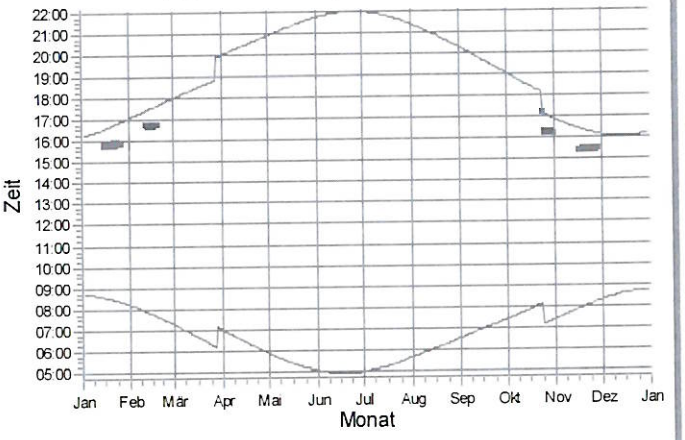
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Hanewort 2, 21770 Lamstedt



WEA

WEA10: E-70 E4 (M2)
WEA11: E-70 E4 (M3)
WEA12: E-70 E4 (M5)
WEA13: E-70 E4 (M6)

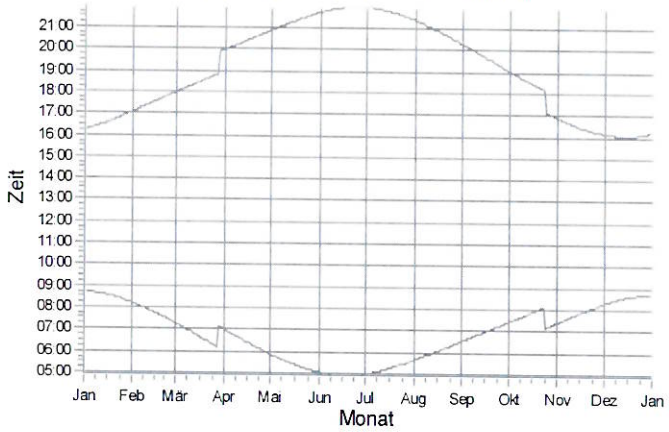
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

IP37: Mittelstenaher Str. 32, 21769 Lamstedt



WEA

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA10 - E-70 E4 (M2)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai	Juni
1	08:41		08:12	09:54-10:14/20	07:15	07:00	05:51	05:02
	16:14		17:05	08:58-09:11/13	18:00	19:58	20:53	21:43
2	08:41		08:10	09:54-10:13/19	07:12	06:57	05:49	05:01
	16:15		17:07	08:59-09:12/13	18:02	20:00	20:55	21:44
3	08:41		08:08	09:57-10:13/16	07:10	06:55	05:47	05:00
	16:16		17:09	09:00-09:11/11	18:04	20:02	20:57	21:45
4	08:41		08:06	09:58-10:11/13	07:08	06:53	05:45	04:59
	16:18		17:11	09:01-09:10/9	18:06	20:04	20:59	21:46
5	08:41		08:05	10:01-10:09/8	07:05	06:50	05:43	04:59
	16:19		17:13	09:03-09:09/6	18:08	20:06	21:00	21:47
6	08:40		08:03		07:03	06:48	05:41	04:58
	16:20		17:15		18:10	20:07	21:02	21:48
7	08:40		08:01		07:01	06:45	05:39	04:57
	16:21		17:17		18:12	20:09	21:04	21:49
8	08:39		07:59		06:58	06:43	05:37	04:57
	16:23		17:19		18:14	20:11	21:06	21:50
9	08:39		07:57		06:56	06:41	05:35	04:56
	16:24		17:21		18:16	20:13	21:07	21:51
10	08:38		07:55	16:44-16:49/5	06:53	06:38	05:34	04:56
	16:26		17:23	08:34-08:38/4	18:17	20:15	21:09	21:52
11	08:37		07:53	16:41-16:50/9	06:51	06:36	05:32	04:55
	16:27		17:25	08:32-08:40/8	18:19	20:17	21:11	21:53
12	08:37		07:51	16:40-16:51/11	06:49	06:34	05:30	04:55
	16:29		17:27	08:31-08:42/11	18:21	20:18	21:13	21:54
13	08:36		07:49	16:40-16:52/12	06:46	06:31	05:28	04:55
	16:30		17:29	08:29-08:41/12	18:23	20:20	21:14	21:54
14	08:35	09:56-10:02/6	07:47	16:40-16:52/12	06:44	06:29	05:27	04:54
	16:32		17:31	08:29-08:42/13	18:25	20:22	21:16	21:55
15	08:34	09:54-10:05/11	07:45	16:40-16:52/12 16:53-17:00/7	06:41	06:27	05:25	04:54
	16:34		17:33	08:29-08:42/13	18:27	20:24	21:18	21:56
16	08:33	09:53-10:07/14	07:43	16:41-16:51/10 16:52-17:01/9	06:39	06:24	05:23	04:54
	16:35		17:35	08:30-08:42/12	18:29	20:26	21:19	21:56
17	08:32	09:53-10:08/15	07:41	16:42-17:02/20	06:36	06:22	05:22	04:54
	16:37		17:37	08:31-08:41/10	18:31	20:28	21:21	21:57
18	08:31	09:52-10:09/17	07:39	16:44-16:47/3 16:50-17:02/12	06:34	06:20	05:20	04:54
	16:39		17:39	08:31-08:39/8	18:32	20:29	21:23	21:57
19	08:30	09:51-10:10/19	07:37	16:50-17:02/12	06:32	06:17	05:18	04:54
	16:40		17:41		18:34	20:31	21:24	21:57
20	08:29	09:51-10:12/21	07:35	16:51-17:02/11	06:29	06:15	05:17	04:54
	16:42		17:43		18:36	20:33	21:26	21:58
21	08:28	09:51-10:12/21	07:33	16:52-17:01/9	06:27	06:13	05:15	04:54
	16:44		17:45		18:38	20:35	21:27	21:58
22	08:26	09:51-10:13/22	07:30	16:53-16:59/6	06:24	06:11	05:14	04:54
	16:46		17:47		18:40	20:37	21:29	21:58
23	08:25	09:50-10:13/23	07:28		06:22	06:08	05:13	04:54
	16:48		17:49		18:42	20:39	21:30	21:58
24	08:24	09:51-10:14/23	07:26		06:19	06:06	05:11	04:55
	16:50		17:51		18:44	20:40	21:32	21:58
25	08:22	09:50-10:14/24	07:24		06:17	06:04	05:10	04:55
	16:51		17:53		18:45	20:42	21:33	21:58
26	08:21	09:51-10:15/24	07:21		06:15	06:02	05:09	04:55
	16:53	09:02-09:06/4	17:54		18:47	20:44	21:35	21:58
27	08:19	09:51-10:15/24	07:19		06:12	06:00	05:07	04:56
	16:55	09:00-09:08/8	17:56		18:49	20:46	21:36	21:58
28	08:18	09:51-10:15/24	07:17		06:10	05:57	05:06	04:56
	16:57	08:59-09:09/10	17:58		18:51	20:48	21:38	21:58
29	08:16	09:52-10:16/24			07:07	05:55	05:05	04:57
	16:59	08:59-09:11/12			19:53	20:50	21:39	21:58
30	08:15	09:52-10:15/23			07:05	05:53	05:04	04:58
	17:01	08:58-09:11/13			19:55	20:51	21:40	21:58
31	08:13	09:53-10:15/22			07:02		05:03	
	17:03	08:58-09:11/13			19:56		21:42	
Sonnenscheinstunden	251		274		367	420	493	509
Anzahl Minuten mit Schatten	417		379		0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA10 - E-70 E4 (M2)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22 16:13-16:17/4	08:17
	21:57	21:23	20:17	19:03	16:53 08:04-08:07/3	16:09
2	04:59	05:39	06:33	07:26	07:24	08:18
	21:57	21:21	20:14	19:01	16:51	16:08
3	05:00	05:41	06:35	07:28	07:26	08:20
	21:57	21:19	20:12	18:58	16:49	16:08
4	05:01	05:43	06:37	07:30	07:28	08:21
	21:56	21:17	20:09	18:56	16:47	16:07
5	05:01	05:44	06:39	07:32	07:30	08:23
	21:56	21:15	20:07	18:54	16:45	16:06
6	05:02	05:46	06:40	07:33	07:32 09:30-09:39/9	08:24
	21:55	21:13	20:05	18:51	16:44 08:32-08:39/7	16:06
7	05:03	05:48	06:42	07:35	07:34 09:28-09:41/13	08:25
	21:54	21:11	20:02	18:49	16:42 08:31-08:40/9	16:05
8	05:04	05:50	06:44	07:37	07:36 09:26-09:43/17	08:27
	21:54	21:09	20:00	18:46	16:40 08:30-08:41/11	16:05
9	05:05	05:51	06:46	07:39	07:38 09:25-09:44/19	08:28
	21:53	21:08	19:57	18:44	16:38 08:29-08:42/13	16:05
10	05:06	05:53	06:47	07:41	07:39 09:24-09:45/21	08:29
	21:52	21:06	19:55	18:42	16:36 08:29-08:42/13	16:04
11	05:08	05:55	06:49	07:42	07:41 09:24-09:46/22	08:30
	21:51	21:03	19:52	18:39	16:35 08:30-08:43/13	16:04
12	05:09	05:56	06:51	07:44	07:43 09:24-09:47/23	08:31
	21:50	21:01	19:50	18:37	16:33 08:30-08:43/13	16:04
13	05:10	05:58	06:53	07:46	07:45 09:24-09:48/24	08:32
	21:49	20:59	19:47	18:35	16:31 08:31-08:42/11	16:04
14	05:11	06:00	06:54	07:48	07:47 09:24-09:48/24	08:33
	21:48	20:57	19:45	18:32	16:30 08:32-08:42/10	16:04
15	05:12	06:02	06:56	07:50	07:49 09:24-09:48/24	08:34
	21:47	20:55	19:43	18:30	16:28 08:33-08:41/8	16:04
16	05:14	06:03	06:58	07:52	07:51 09:24-09:48/24	08:35
	21:46	20:53	19:40	18:28	16:27 08:35-08:39/4	16:04
17	05:15	06:05	07:00	07:54	07:53 09:24-09:48/24	08:36
	21:45	20:51	19:38	18:25	16:25	16:04
18	05:16	06:07	07:01	07:55	07:54 09:25-09:48/23	08:37
	21:44	20:49	19:35	18:23	16:24	16:04
19	05:18	06:09	07:03	07:57	07:56 09:25-09:48/23	08:37
	21:43	20:46	19:33	18:21	16:22	16:05
20	05:19	06:10	07:05	07:59 17:23-17:31/8	07:58 09:26-09:48/22	08:38
	21:41	20:44	19:30	18:19	16:21	16:05
21	05:21	06:12	07:07	08:01 17:22-17:32/10	08:00 09:27-09:48/21	08:39
	21:40	20:42	19:28	18:16	16:20	16:05
22	05:22	06:14	07:08	08:03 17:21-17:32/11	08:02 09:27-09:48/21	08:39
	21:39	20:40	19:25	18:14	16:18	16:06
23	05:23	06:16	07:10	08:05 09:04-09:07/3	08:03 09:28-09:47/19	08:40
	21:37	20:37	19:23	18:12 17:21-17:33/12	16:17	16:06
24	05:25	06:17	07:12	08:07 17:13-17:19/6 17:21-17:32/11	08:05 09:30-09:47/17	08:40
	21:36	20:35	19:20	18:10 09:01-09:10/9	16:16	16:07
25	05:27	06:19	07:14	07:09 16:11-16:20/9 16:21-16:32/11	08:07 09:31-09:47/16	08:41
	21:34	20:33	19:18	17:08 08:00-08:11/11	16:15	16:08
26	05:28	06:21	07:15	07:11 16:10-16:21/11 16:22-16:31/9	08:09 09:31-09:45/14	08:41
	21:33	20:31	19:15	17:05 07:59-08:11/12	16:14	16:08
27	05:30	06:23	07:17	07:13 16:10-16:21/11 16:23-16:28/5	08:10 09:33-09:44/11	08:41
	21:31	20:28	19:13	17:03 07:59-08:11/12	16:13	16:09
28	05:31	06:25	07:19	07:14 16:09-16:21/12	08:12 09:36-09:43/7	08:41
	21:29	20:26	19:11	17:01 07:59-08:11/12	16:12	16:10
29	05:33	06:26	07:21	07:16 16:09-16:21/12	08:14	08:41
	21:28	20:24	19:08	16:59 07:59-08:11/12	16:11	16:11
30	05:34	06:28	07:23	07:18 16:10-16:20/10	08:15	08:42
	21:26	20:21	19:06	16:57 07:59-08:10/11	16:10	16:12
31	05:36	06:30		07:20 16:11-16:19/8		08:42
	21:24	20:19		16:55 08:00-08:09/9		16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	247	557	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA11 - E-70 E4 (M3)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai		Juni
1	08:41		08:12	15:45-15:59/14	07:15	07:00	05:51		05:02
	16:14		17:05	16:00-16:14/14	18:00	19:58	20:53		21:43
2	08:41		08:10	15:46-16:14/28	07:12	06:57	05:49		05:01
	16:15		17:07		18:02	20:00	20:55		21:44
3	08:41		08:08	15:47-15:58/11	07:10	06:55	05:47		05:00
	16:16		17:09	15:59-16:15/16	18:04	20:02	20:57		21:45
4	08:41		08:06	15:50-15:57/7	07:08	06:53	05:45		04:59
	16:18		17:11	16:00-16:16/16	18:06	20:04	20:59		21:46
5	08:41		08:05	16:00-16:16/16	07:05	06:50	05:43	20:23-20:28/5	04:59
	16:19		17:13		18:08	20:06	21:00		21:47
6	08:40		08:03	16:00-16:16/16	07:03	06:48	05:41	20:21-20:29/8	04:58
	16:20		17:15		18:10	20:07	21:02		21:48
7	08:40		08:01	16:01-16:16/15	07:00	06:45	05:39	20:20-20:29/9	04:57
	16:21		17:17		18:12	20:09	21:04		21:49
8	08:39		07:59	16:02-16:15/13	06:58	06:43	05:37	20:20-20:30/10	04:57
	16:23		17:19		18:14	20:11	21:06		21:50
9	08:39		07:57	08:44-08:52/8	06:56	06:41	05:35	20:20-20:30/10	04:56
	16:24		17:21	16:03-16:14/11	18:16	20:13	21:07		21:51
10	08:38		07:55	08:42-08:54/12	06:53	06:38	05:34	20:19-20:30/11	04:56
	16:26		17:23	16:05-16:12/7	18:17	20:15	21:09		21:52
11	08:37		07:53	08:41-08:55/14	06:51	06:36	05:32	20:20-20:30/10	04:55
	16:27		17:25		18:19	20:17	21:11		21:53
12	08:37		07:51	08:40-08:55/15	06:49	06:34	05:30	20:21-20:29/8	04:55
	16:29		17:27		18:21	20:18	21:13		21:54
13	08:36		07:49	08:40-08:55/15	06:46	06:31	05:28	20:21-20:27/6	04:54
	16:30		17:29		18:23	20:20	21:14		21:54
14	08:35		07:47	08:40-08:55/15	06:44	06:29	05:26		04:54
	16:32		17:31		18:25	20:22	21:16		21:55
15	08:34		07:45	08:40-08:55/15	06:41	06:26	05:25		04:54
	16:34		17:33		18:27	20:24	21:18		21:56
16	08:33		07:43	08:40-08:55/15	06:39	06:24	05:23		04:54
	16:35		17:35		18:29	20:26	21:19		21:56
17	08:32		07:41	08:41-08:55/14	06:36	06:22	05:22		04:54
	16:37		17:37		18:31	20:28	21:21		21:57
18	08:31		07:39	08:41-08:53/12	06:34	06:20	05:20		04:54
	16:39		17:39		18:32	20:29	21:23		21:57
19	08:30		07:37	08:44-08:51/7	06:32	06:17	05:18		04:54
	16:40		17:41		18:34	20:31	21:24		21:57
20	08:29		07:35		06:29	06:15	05:17		04:54
	16:42		17:43		18:36	20:33	21:26		21:58
21	08:28	15:48-15:51/3	07:32		06:27	06:13	05:15		04:54
	16:44		17:45		18:38	20:35	21:27		21:58
22	08:26	15:46-15:54/8	07:30		06:24	06:11	05:14		04:54
	16:46		17:47		18:40	20:37	21:29		21:58
23	08:25	15:45-15:55/10	07:28		06:22	06:08	05:13		04:54
	16:48		17:49		18:42	20:39	21:30		21:58
24	08:24	15:44-15:57/13	07:26		06:19	06:06	05:11		04:55
	16:50		17:51		18:44	20:40	21:32		21:58
25	08:22	15:44-15:58/14	07:24		06:17	06:04	05:10		04:55
	16:51		17:52		18:45	20:42	21:33		21:58
26	08:21	15:44-15:59/15	07:21		06:15	06:02	05:09		04:55
	16:53		17:54		18:47	20:44	21:35		21:58
27	08:19	15:43-15:59/16	07:19		06:12	06:00	05:07		04:56
	16:55		17:56		18:49	20:46	21:36		21:58
28	08:18	15:43-15:59/16	07:17		06:10	05:57	05:06		04:56
	16:57		17:58		18:51	20:48	21:38		21:58
29	08:16	15:44-16:00/16			07:07	05:55	05:05		04:57
	16:59	16:04-16:10/6			19:53	20:50	21:39		21:58
30	08:15	15:44-16:00/16			07:05	05:53	05:04		04:58
	17:01	16:02-16:12/10			19:55	20:51	21:40		21:58
31	08:13	15:44-16:00/16			07:02		05:03		
	17:03	16:01-16:13/12			19:56		21:41		
Sonnenscheinstunden	251		274		367	420	493		509
Anzahl Minuten mit Schatten	171		326		0	0	77		0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA11 - E-70 E4 (M3)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober		November		Dezember
1	04:58		05:38	20:31-20:40/9	06:32	07:24		07:22	08:11-08:22/11	08:17
	21:57		21:23		20:16	19:03		16:53	15:33-15:41/8	16:09
2	04:59		05:39	20:31-20:41/10	06:33	07:26		07:24	08:14-08:21/7	08:18
	21:57		21:21		20:14	19:01		16:51	15:31-15:43/12	16:08
3	05:00		05:41	20:30-20:40/10	06:35	07:28		07:26	15:31-15:45/14	08:20
	21:57		21:19		20:12	18:58		16:49		16:08
4	05:01		05:43	20:30-20:41/11	06:37	07:30		07:28	15:30-15:45/15	08:21
	21:56		21:17		20:09	18:56		16:47		16:07
5	05:01		05:44	20:30-20:40/10	06:39	07:32		07:30	15:30-15:46/16	08:23
	21:56		21:15		20:07	18:54		16:45		16:06
6	05:02		05:46	20:31-20:40/9	06:40	07:33		07:32	15:30-15:46/16	08:24
	21:55		21:13		20:04	18:51		16:43		16:06
7	05:03		05:48	20:31-20:38/7	06:42	07:35		07:34	15:19-15:27/8	08:25
	21:54		21:11		20:02	18:49		16:42	15:30-15:46/16	16:05
8	05:04		05:50	20:33-20:36/3	06:44	07:37		07:36	15:18-15:28/10	08:27
	21:54		21:09		20:00	18:46		16:40	15:30-15:46/16	16:05
9	05:05		05:51		06:46	07:39		07:38	15:16-15:45/29	08:28
	21:53		21:07		19:57	18:44		16:38		16:05
10	05:06		05:53		06:47	07:41		07:39	15:16-15:30/14	08:29
	21:52		21:05		19:55	18:42		16:36	15:31-15:45/14	16:04
11	05:07		05:55		06:49	07:42		07:41	15:15-15:31/16	08:30
	21:51		21:03		19:52	18:39		16:35	15:32-15:44/12	16:04
12	05:09		05:56		06:51	07:44		07:43	15:15-15:31/16	08:31
	21:50		21:01		19:50	18:37		16:33	15:33-15:42/9	16:04
13	05:10		05:58		06:53	07:46		07:45	15:16-15:32/16	08:32
	21:49		20:59		19:47	18:35		16:31	15:36-15:41/5	16:04
14	05:11		06:00		06:54	07:48		07:47	15:16-15:32/16	08:33
	21:48		20:57		19:45	18:32		16:30		16:04
15	05:12		06:02		06:56	07:50		07:49	15:16-15:32/16	08:34
	21:47		20:55		19:43	18:30		16:28		16:04
16	05:14		06:03		06:58	07:52		07:51	15:17-15:32/15	08:35
	21:46		20:53		19:40	18:28		16:27		16:04
17	05:15		06:05		07:00	07:54		07:53	15:17-15:32/15	08:36
	21:45		20:51		19:38	18:25		16:25		16:04
18	05:16		06:07		07:01	07:55		07:54	15:18-15:31/13	08:37
	21:44		20:49		19:35	18:23		16:24		16:04
19	05:18		06:09		07:03	07:57		07:56	15:20-15:30/10	08:37
	21:43		20:46		19:33	18:21		16:22		16:05
20	05:19		06:10		07:05	07:59		07:58	15:21-15:29/8	08:38
	21:41		20:44		19:30	18:19		16:21		16:05
21	05:21		06:12		07:07	08:01		08:00	15:24-15:27/3	08:39
	21:40		20:42		19:28	18:16		16:20		16:05
22	05:22		06:14		07:08	08:03		08:02		08:39
	21:39		20:40		19:25	18:14		16:18		16:06
23	05:23		06:16		07:10	08:05	09:13-09:22/9	08:03		08:40
	21:37		20:37		19:23	18:12		16:17		16:06
24	05:25		06:17		07:12	08:07	09:12-09:24/12	08:05		08:40
	21:36		20:35		19:20	18:10		16:16		16:07
25	05:26		06:19		07:14	07:09	08:10-08:24/14	08:07		08:41
	21:34		20:33		19:18	17:08		16:15		16:08
26	05:28		06:21		07:15	07:11	08:10-08:25/15	08:09		08:41
	21:33		20:31		19:15	17:05		16:14		16:08
27	05:30		06:23		07:17	07:13	08:09-08:25/16	08:10		08:41
	21:31		20:28		19:13	17:03		16:13		16:09
28	05:31		06:24		07:19	07:14	08:09-08:25/16	08:12		08:41
	21:29		20:26		19:11	17:01		16:12		16:10
29	05:33		06:26		07:21	07:16	08:09-08:25/16	08:14		08:41
	21:28		20:24		19:08	16:59		16:11		16:11
30	05:34	20:33-20:37/4	06:28		07:23	07:18	08:09-08:24/15	08:15		08:41
	21:26		20:21		19:06	16:57		16:10		16:12
31	05:36	20:31-20:38/7	06:30			07:20	08:10-08:23/13			08:41
	21:24		20:19			16:55				16:13
Sonnenscheinstunden	511		459		382	329		260		234
Anzahl Minuten mit Schatten		11		69	0		126		376	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA12 - E-70 E4 (M5)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41 09:29-09:31/2 16:14	08:12 17:05	07:15 18:00	07:00 19:58	05:51 20:53	05:02 21:43	04:58 21:57	05:38 21:23	06:32 20:17	07:24 19:03	07:22 16:53	08:17 09:10-09:23/13 16:09
2	08:41 09:28-09:33/5 16:15	08:10 17:07	07:12 18:02	06:58 20:00	05:49 20:55	05:01 21:44	04:59 21:57	05:39 21:21	06:33 20:14	07:26 19:01	07:24 16:51	08:18 09:11-09:24/13 16:08
3	08:41 09:28-09:35/7 16:16	08:08 17:09	07:10 18:04	06:55 20:02	05:47 20:57	05:00 21:45	05:00 21:57	05:41 21:19	06:35 20:12	07:28 18:58	07:26 16:49	08:20 09:12-09:24/12 16:08
4	08:41 09:28-09:35/7 16:18	08:06 17:11	07:08 18:06	06:53 20:04	05:45 20:59	05:00 21:46	05:01 21:56	05:43 21:17	06:37 20:09	07:30 18:56	07:28 16:47	08:21 09:12-09:24/12 16:07
5	08:41 09:28-09:37/9 16:19	08:05 17:13	07:05 18:08	06:50 20:06	05:43 21:00	04:59 21:47	05:01 21:56	05:44 21:15	06:39 20:07	07:32 18:54	07:30 16:45	08:23 09:13-09:24/11 16:07
6	08:40 09:28-09:38/10 16:20	08:03 17:15	07:03 18:10	06:48 20:07	05:41 21:02	04:58 21:48	05:02 21:55	05:46 21:13	06:40 20:05	07:33 18:51	07:32 16:44	08:24 09:14-09:24/10 16:06
7	08:40 09:28-09:39/11 16:21	08:01 17:17	07:01 18:12	06:45 20:09	05:39 21:04	04:57 21:49	05:03 21:54	05:48 21:11	06:42 20:02	07:35 18:49	07:34 16:42	08:25 09:14-09:23/9 16:06
8	08:39 09:28-09:39/11 16:23	07:59 17:19	06:58 18:14	06:43 20:11	05:37 21:06	04:57 21:50	05:04 21:54	05:50 21:09	06:44 20:00	07:37 18:46	07:36 16:40	08:27 09:16-09:24/8 16:05
9	08:39 09:28-09:40/12 16:24	07:57 17:21	06:56 18:16	06:41 20:13	05:35 21:07	04:56 21:51	05:05 21:53	05:51 21:08	06:46 19:57	07:39 18:44	07:38 16:38	08:28 09:16-09:23/7 16:05
10	08:38 09:28-09:40/12 16:26	07:55 17:23	06:53 18:18	06:38 20:15	05:34 21:09	04:56 21:52	05:06 21:52	05:53 21:06	06:47 19:55	07:41 18:42	07:39 16:36	08:29 09:17-09:22/5 16:04
11	08:37 09:28-09:41/13 16:27	07:53 17:25	06:51 18:19	06:36 20:17	05:32 21:11	04:55 21:53	05:08 21:51	05:55 21:03	06:49 19:52	07:43 18:39	07:41 16:35	08:30 09:20-09:22/2 16:04
12	08:37 09:28-09:41/13 16:29	07:51 17:27	06:49 18:21	06:34 20:18	05:30 21:13	04:55 21:54	05:09 21:50	05:56 21:01	06:51 19:50	07:44 18:37	07:43 16:33	08:31 16:04
13	08:36 09:28-09:42/14 16:30	07:49 17:29	06:46 18:23	06:31 20:20	05:28 21:14	04:55 21:54	05:10 21:49	05:58 20:59	06:53 19:47	07:46 18:35	07:45 16:31	08:32 16:04
14	08:35 09:29-09:42/13 16:32	07:47 17:31	06:44 18:25	06:29 20:22	05:27 21:16	04:54 21:55	05:11 21:48	06:00 20:57	06:54 19:45	07:48 18:32	07:47 16:30	08:33 16:04
15	08:34 09:30-09:42/12 16:34	07:45 17:33	06:41 18:27	06:27 20:24	05:25 21:18	04:54 21:56	05:12 21:47	06:02 20:55	06:56 19:43	07:50 18:30	07:49 16:28	08:34 16:04
16	08:33 09:30-09:43/13 16:35	07:43 17:35	06:39 18:29	06:24 20:26	05:23 21:19	04:54 21:56	05:14 21:46	06:03 20:53	06:58 19:40	07:52 18:28	07:51 16:27	08:35 09:53-09:54/1 16:04
17	08:32 09:31-09:43/12 16:37	07:41 17:37	06:37 18:31	06:22 20:28	05:22 21:21	04:54 21:57	05:15 21:45	06:05 20:51	07:00 19:38	07:54 18:25	07:53 16:25	08:36 09:52-09:56/4 16:04
18	08:31 09:32-09:43/11 16:39	07:39 17:39	06:34 18:32	06:20 20:29	05:20 21:23	04:54 21:57	05:16 21:44	06:07 20:49	07:01 19:35	07:55 18:23	07:55 16:24	08:37 09:52-09:56/4 16:04
19	08:30 09:33-09:42/9 16:41	07:37 17:41	06:32 18:34	06:17 20:31	05:18 21:24	04:54 21:57	05:18 21:43	06:09 20:46	07:03 19:33	07:57 18:21	07:56 16:22	08:37 09:52-09:57/5 16:05
20	08:29 09:35-09:41/6 16:42	07:35 17:43	06:29 18:36	06:15 20:33	05:17 21:26	04:54 21:58	05:19 21:41	06:10 20:44	07:05 19:30	07:59 18:19	07:58 16:21	08:38 09:53-09:58/5 16:05
21	08:28 16:44	07:33 17:45	06:27 18:38	06:13 20:35	05:15 21:27	04:54 21:58	05:21 21:40	06:12 20:42	07:07 19:28	08:01 18:16	08:00 16:20	08:39 09:53-09:58/5 16:05
22	08:26 16:46	07:30 17:47	06:24 18:40	06:11 20:37	05:14 21:29	04:54 21:58	05:22 21:39	06:14 20:40	07:08 19:25	08:03 18:14	08:02 09:11-09:17/6 16:18	08:39 09:54-09:59/5 16:06
23	08:25 16:48	07:28 17:49	06:22 18:42	06:08 20:39	05:13 21:30	04:54 21:58	05:24 21:37	06:16 20:37	07:10 19:23	08:05 18:12	08:03 09:10-09:19/9 16:17	08:40 09:54-09:59/5 16:06
24	08:24 16:50	07:26 17:51	06:19 18:44	06:06 20:40	05:11 21:32	04:55 21:58	05:25 21:36	06:17 20:35	07:12 19:20	08:07 18:10	08:05 09:09-09:20/11 16:16	08:40 09:54-09:59/5 16:07
25	08:22 16:51	07:24 17:53	06:17 18:45	06:04 20:42	05:10 21:33	04:55 21:58	05:27 21:34	06:19 20:33	07:14 19:18	07:09 17:08	08:07 09:09-09:21/12 16:15	08:41 09:55-10:00/5 16:08
26	08:21 16:53	07:21 17:54	06:15 18:47	06:02 20:44	05:09 21:35	04:55 21:58	05:28 21:33	06:21 20:31	07:15 19:15	07:11 17:05	08:09 09:08-09:21/13 16:14	08:41 09:56-10:00/4 16:08
27	08:19 16:55	07:19 17:56	06:12 18:49	06:00 20:46	05:08 21:36	04:56 21:58	05:30 21:31	06:23 20:28	07:17 19:13	07:13 17:03	08:10 09:09-09:22/13 16:13	08:41 09:57-10:00/3 16:09
28	08:18 16:57	07:17 17:58	06:10 18:51	05:57 20:48	05:06 21:38	04:56 21:58	05:31 21:29	06:25 20:26	07:19 19:11	07:14 17:01	08:12 09:09-09:22/13 16:12	08:41 16:10
29	08:16 16:59		07:07 19:53	05:55 20:50	05:05 21:39	04:57 21:58	05:33 21:28	06:26 20:24	07:21 19:08	07:16 16:59	08:14 09:10-09:23/13 16:11	08:41 16:11
30	08:15 17:01		07:05 19:55	05:53 20:51	05:04 21:40	04:58 21:58	05:34 21:26	06:28 20:21	07:23 19:06	07:18 16:57	08:15 09:10-09:23/13 16:10	08:42 16:12
31	08:13 17:03		07:02 19:56		05:03 21:42		05:36 21:24	06:30 20:19		07:20 16:55		08:42 16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	202	0	0	0	0	0	0	0	0	0	103	153

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA13 - E-70 E4 (M6)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 09:56-10:12/16 16:14	08:12 08:52-09:02/10 17:05	07:15 18:00	07:00 19:58	05:51 20:53	05:02 21:43
2	08:41 09:56-10:13/17 16:15	08:10 08:53-09:03/10 17:07	07:12 18:02	06:57 20:00	05:49 20:55	05:01 21:44
3	08:41 09:57-10:14/17 16:16	08:08 08:54-09:02/8 17:09	07:10 18:04	06:55 20:02	05:47 20:57	05:00 21:45
4	08:41 09:57-10:13/16 16:18	08:06 08:56-09:00/4 17:11	07:08 18:06	06:53 20:04	05:45 20:59	05:00 21:46
5	08:41 09:58-10:14/16 16:19	08:05 17:13	07:05 18:08	06:50 20:06	05:43 21:00	04:59 21:47
6	08:40 09:58-10:14/16 16:20	08:03 17:15	07:03 18:10	06:48 20:07	05:41 21:02	04:58 21:48
7	08:40 09:59-10:14/15 16:21	08:01 17:17	07:01 18:12	06:45 20:09	05:39 21:04	04:57 21:49
8	08:39 10:00-10:15/15 16:23	07:59 17:19	06:58 18:14	06:43 20:11	05:37 21:06	04:57 21:50
9	08:39 10:01-10:15/14 16:24	07:57 17:21	06:56 18:16	06:41 20:13	05:35 21:07	04:56 21:51
10	08:38 10:01-10:14/13 16:26	07:55 17:23	06:53 18:17	06:38 20:15	05:34 21:09	04:56 21:52
11	08:37 10:02-10:14/12 16:27 09:14-09:18/4	07:53 17:25	06:51 18:19	06:36 20:17	05:32 21:11	04:55 21:53
12	08:37 10:03-10:13/10 16:29 09:13-09:20/7	07:51 17:27	06:49 18:21	06:34 20:18	05:30 21:13	04:55 21:54
13	08:36 10:05-10:13/8 16:30 09:13-09:21/8	07:49 17:29	06:46 18:23	06:31 20:20	05:28 21:14	04:55 21:54
14	08:35 15:47-15:52/5 09:13-09:22/9 16:32 10:08-10:11/3	07:47 17:31	06:44 18:25	06:29 20:22	05:27 21:16	04:54 21:55
15	08:34 15:46-15:54/8 16:34 09:13-09:23/10	07:45 17:33	06:41 18:27	06:27 20:24	05:25 21:18	04:54 21:56
16	08:33 15:46-15:55/9 16:35 09:13-09:24/11	07:43 17:35	06:39 18:29	06:24 20:26	05:23 21:19	04:54 21:56
17	08:32 15:46-15:56/10 16:37 09:14-09:24/10	07:41 17:37	06:36 18:31	06:22 20:28	05:22 21:21	04:54 21:57
18	08:31 15:45-15:56/11 16:39 09:14-09:25/11	07:39 17:39	06:34 18:32	06:20 20:29	05:20 21:23	04:54 21:57
19	08:30 15:45-15:57/12 16:40 09:14-09:24/10	07:37 17:41	06:32 18:34	06:17 20:31	05:18 21:24	04:54 21:57
20	08:29 15:46-15:58/12 16:42 09:15-09:25/10	07:35 17:43	06:29 18:36	06:15 20:33	05:17 21:26	04:54 21:58
21	08:28 15:46-15:58/12 09:15-09:24/9 16:44 15:59-16:05/6	07:32 17:45	06:27 18:38	06:13 20:35	05:15 21:27	04:54 21:58
22	08:26 15:47-15:58/11 09:17-09:23/6 16:46 15:59-16:07/8	07:30 17:47	06:24 18:40	06:11 20:37	05:14 21:29	04:54 21:58
23	08:25 15:47-15:57/10 09:20-09:22/2 16:48 15:58-16:08/10	07:28 17:49	06:22 18:42	06:08 20:39	05:13 21:30	04:54 21:58
24	08:24 15:48-16:09/21 16:50	07:26 17:51	06:19 18:44	06:06 20:40	05:11 21:32	04:55 21:58
25	08:22 15:49-15:56/7 16:51 15:58-16:09/11	07:24 17:53	06:17 18:45	06:04 20:42	05:10 21:33	04:55 21:58
26	08:21 15:52-15:55/3 16:53 15:58-16:10/12	07:21 17:54	06:15 18:47	06:02 20:44	05:09 21:35	04:55 21:58
27	08:19 08:54-08:59/5 16:55 15:58-16:10/12	07:19 17:56	06:12 18:49	06:00 20:46	05:07 21:36	04:56 21:58
28	08:18 08:52-09:00/8 16:57 15:59-16:10/11	07:17 17:58	06:10 18:51	05:57 20:48	05:06 21:38	04:56 21:58
29	08:16 08:52-09:02/10 16:59 16:00-16:10/10		07:07 19:53	05:55 20:50	05:05 21:39	04:57 21:58
30	08:15 08:52-09:02/10 17:01 16:01-16:09/8		07:05 19:55	05:53 20:51	05:04 21:40	04:58 21:58
31	08:13 08:52-09:02/10 17:03 16:03-16:07/4		07:02 19:56		05:03 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	561	32	0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA13 - E-70 E4 (M6)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22	08:17 09:44-09:56/12
	21:57	21:23	20:17	19:03	16:53	16:09 08:56-09:01/5
2	04:59	05:39	06:33	07:26	07:24	08:18 09:45-09:57/12
	21:57	21:21	20:14	19:01	16:51	16:08
3	05:00	05:41	06:35	07:28	07:26	08:20 09:44-09:58/14
	21:57	21:19	20:12	18:58	16:49	16:08
4	05:01	05:43	06:37	07:30	07:28	08:21 09:44-09:59/15
	21:56	21:17	20:09	18:56	16:47	16:07
5	05:01	05:44	06:39	07:32	07:30	08:23 09:45-10:00/15
	21:56	21:15	20:07	18:54	16:45	16:06
6	05:02	05:46	06:40	07:33	07:32	08:24 09:45-10:00/15
	21:55	21:13	20:05	18:51	16:44	16:06
7	05:03	05:48	06:42	07:35	07:34 08:25-08:30/5	08:25 09:44-10:00/16
	21:54	21:11	20:02	18:49	16:42	16:05
8	05:04	05:50	06:44	07:37	07:36 08:24-08:32/8	08:27 09:45-10:02/17
	21:54	21:09	20:00	18:46	16:40	16:05
9	05:05	05:51	06:46	07:39	07:38 08:23-08:33/10	08:28 09:45-10:02/17
	21:53	21:07	19:57	18:44	16:38	16:05
10	05:06	05:53	06:47	07:41	07:39 08:23-08:33/10	08:29 09:45-10:02/17
	21:52	21:05	19:55	18:42	16:36	16:04
11	05:08	05:55	06:49	07:42	07:41 08:24-08:34/10	08:30 09:47-10:03/16
	21:51	21:03	19:52	18:39	16:35 15:34-15:38/4	16:04
12	05:09	05:56	06:51	07:44	07:43 08:24-08:34/10	08:31 09:47-10:04/17
	21:50	21:01	19:50	18:37	16:33 15:32-15:40/8	16:04
13	05:10	05:58	06:53	07:46	07:45 08:24-08:34/10	08:32 09:47-10:04/17
	21:49	20:59	19:47	18:35	16:31 15:32-15:42/10	16:04
14	05:11	06:00	06:54	07:48	07:47 08:25-08:33/8	08:33 09:48-10:04/16
	21:48	20:57	19:45	18:32	16:30 15:32-15:43/11	16:04
15	05:12	06:02	06:56	07:50	07:49 08:27-08:32/5	08:34 09:48-10:05/17
	21:47	20:55	19:43	18:30	16:28 15:31-15:43/12	16:04
16	05:14	06:03	06:58	07:52	07:51 15:25-15:28/3	08:35 09:49-10:05/16
	21:46	20:53	19:40	18:28	16:27 15:31-15:43/12	16:04
17	05:15	06:05	07:00	07:54	07:53 15:23-15:30/7	08:36 09:48-10:05/17
	21:45	20:51	19:38	18:25	16:25 15:32-15:43/11	16:04
18	05:16	06:07	07:01	07:55	07:54 15:22-15:43/21	08:37 09:49-10:06/17
	21:44	20:49	19:35	18:23	16:24	16:04
19	05:18	06:09	07:03	07:57	07:56 15:22-15:32/10 08:54-08:56/2	08:37 09:50-10:07/17
	21:43	20:46	19:33	18:21	16:22 15:33-15:43/10	16:05
20	05:19	06:10	07:05	07:59	07:58 15:22-15:33/11 08:52-08:58/6	08:38 09:51-10:07/16
	21:41	20:44	19:30	18:19	16:21 15:34-15:42/8	16:05
21	05:21	06:12	07:07	08:01	08:00 15:22-15:34/12 08:51-09:00/9	08:39 09:51-10:07/16
	21:40	20:42	19:28	18:16	16:20 15:35-15:41/6	16:05
22	05:22	06:14	07:08	08:03	08:02 15:22-15:34/12	08:39 09:52-10:08/16
	21:39	20:40	19:25	18:14	16:18 08:51-09:01/10	16:06
23	05:23	06:16	07:10	08:05	08:03 15:23-15:34/11	08:40 09:52-10:08/16
	21:37	20:37	19:23	18:12	16:17 08:51-09:01/10	16:06
24	05:25	06:17	07:12	08:07	08:05 15:23-15:34/11	08:40 09:52-10:08/16
	21:36	20:35	19:20	18:10	16:16 08:51-09:02/11	16:07
25	05:27	06:19	07:14	07:09	08:07 15:23-15:33/10	08:41 09:53-10:10/17
	21:34	20:33	19:18	17:08	16:15 08:52-09:02/10	16:08
26	05:28	06:21	07:15	07:11	08:09 15:24-15:33/9	08:41 09:53-10:10/17
	21:33	20:31	19:15	17:05	16:14 08:51-09:02/11	16:08
27	05:30	06:23	07:17	07:13	08:10 15:25-15:33/8	08:41 09:54-10:10/16
	21:31	20:28	19:13	17:03	16:13 08:52-09:02/10	16:09
28	05:31	06:24	07:19	07:14	08:12 15:27-15:32/5 08:53-09:02/9	08:41 09:54-10:11/17
	21:29	20:26	19:11	17:01	16:12 09:48-09:51/3	16:10
29	05:33	06:26	07:21	07:16	08:14 09:46-09:54/8	08:41 09:54-10:11/17
	21:28	20:24	19:08	16:59	16:11 08:54-09:02/8	16:11
30	05:34	06:28	07:23	07:18	08:15 09:46-09:55/9	08:42 09:55-10:12/17
	21:26	20:21	19:06	16:57	16:10 08:55-09:02/7	16:12
31	05:36	06:30		07:20		08:41 09:56-10:12/16
	21:24	20:19		16:55		16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	421	502

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung **WEA:** WEA14 - E-70 E4 (M8)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
423	332	445	711	583	575	928	1.089	1.155	961	740	514	8.457

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:56		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	0	0	0	0	0	0	0	0

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

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

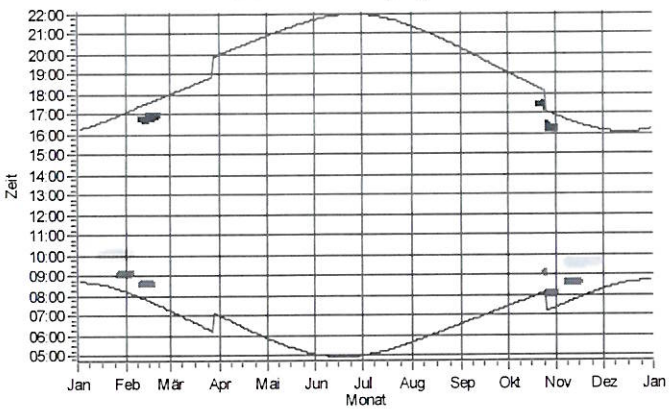
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

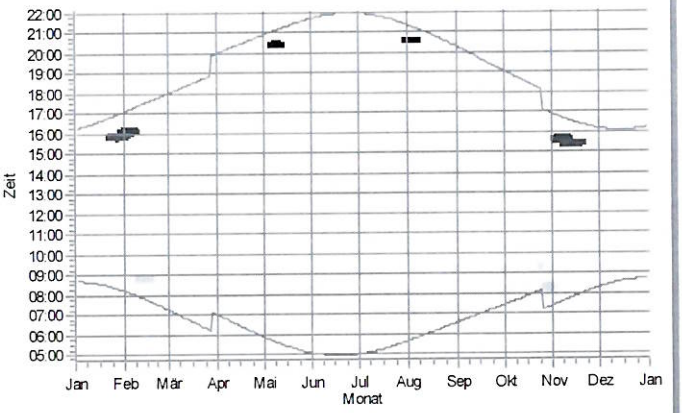
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung

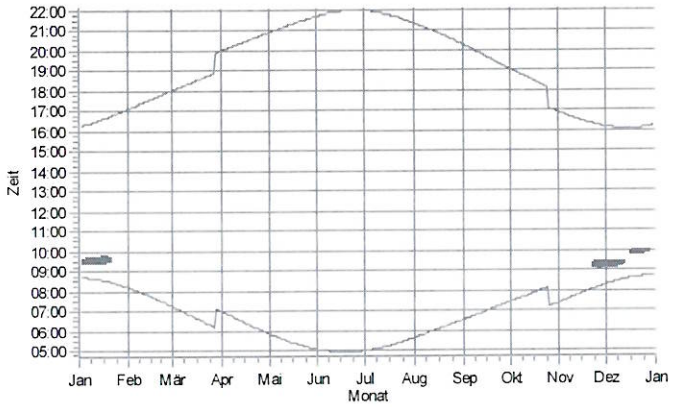
WEA10: E-70 E4 (M2)



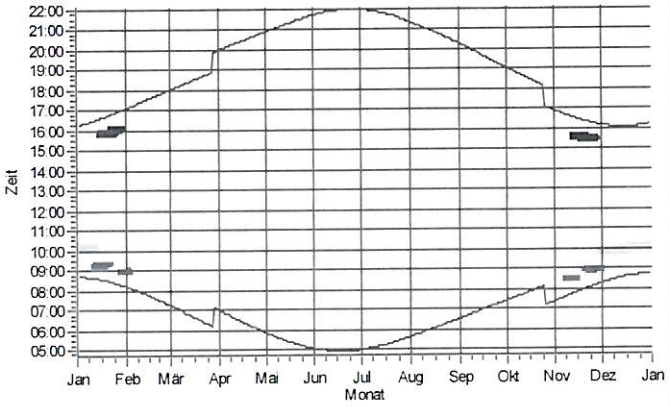
WEA11: E-70 E4 (M3)



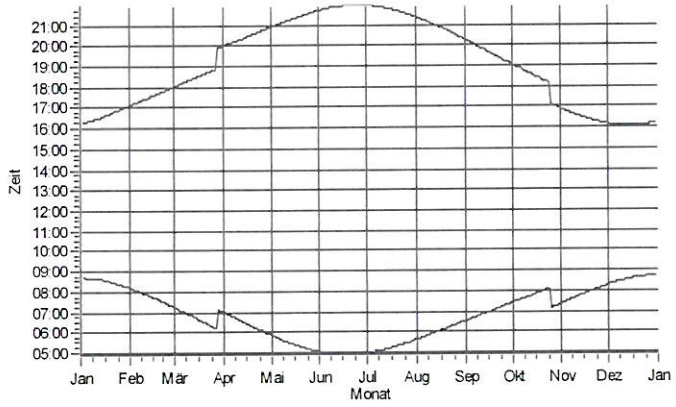
WEA12: E-70 E4 (M5)



WEA13: E-70 E4 (M6)



WEA14: E-70 E4 (M8)



Schattenrezeptoren

- IP01: Sicht 1, 21770 Mittelstenahe
- IP07: Driftweg 2, 21769 Lamstedt
- IP08: Haneworth 1, 21770 Lamstedt
- IP09: Sicht 5, 21770 Mittelstenahe
- IP34: Sicht 3, 21770 Mittelstenahe
- IP36: Haneworth 2, 21770 Lamstedt

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Zusatzbelastung

Annahmen für Schattenwurfberechnung

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

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

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

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

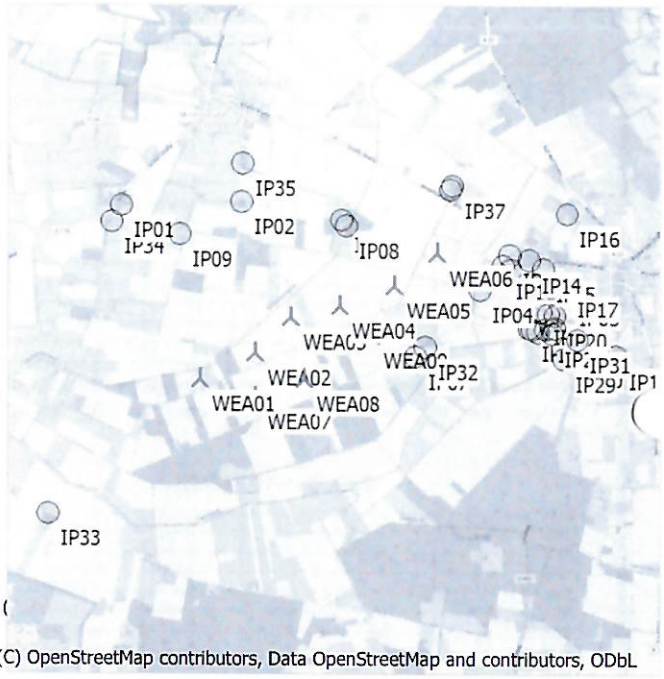
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo (
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



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

Maßstab 1:75.000
Neue WEA
Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotordurch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA01	502.184	5.941.963	10,0	E-138 EP3 E3	Ja	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	160,0	1.686	11,1
WEA02	502.734	5.942.224	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA03	503.091	5.942.569	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA04	503.576	5.942.681	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA05	504.117	5.942.884	16,1	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA06	504.540	5.943.220	19,4	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA07	502.739	5.941.776	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA08	503.226	5.941.962	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA09	503.899	5.942.394	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z [m]	Breite [m]	Höhe [m]	Höhe ü.Gr. [m]	Neigung des Fensters [°]	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr. [m]
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP01	Sticht 1, 21770 Mittelstenahe	0:00	0	0:00	0:00
IP02	Neues Moor 21, 21770 Mittelstenahe	37:42	114	0:31	4:02
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	135:35	87	2:00	13:33
IP04	Wischhofstraße 10, 21769 Lamstedt	67:14	135	0:46	13:57
IP05	Am Kamp 26, 21769 Lamstedt	23:46	75	0:31	5:33
IP06	Strother Heuweg 5, 21769 Lamstedt	24:57	95	0:29	5:37
IP07	Driftweg 2, 21769 Lamstedt	169:04	207	1:48	38:08
IP08	Haneworth 1, 21770 Lamstedt	193:05	167	2:20	21:32
IP09	Sticht 5, 21770 Mittelstenahe	35:32	94	0:30	3:43
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	81:33	155	0:54	17:29
IP12	Auf dem Kampen 6, 21769 Lamstedt	118:36	202	1:01	26:41
IP13	Auf dem Kampen 5, 21769 Lamstedt	92:54	174	0:54	20:50
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	52:42	126	0:43	11:17
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	34:20	85	0:37	7:42
IP16	Kleiner Köven 15A, 21769 Lamstedt	12:20	37	0:29	2:11
IP17	An der Gösche 10, 21769 Lamstedt	23:42	74	0:31	5:21
IP18	Wischhofstraße 17a, 21769 Lamstedt	59:35	146	0:36	13:32
IP19	Wischhofstraße 15, 21769 Lamstedt	49:38	119	0:34	11:32
IP20	Wischhofstraße 13, 21769 Lamstedt	45:48	120	0:32	10:40
IP21	Auf der Stroth 18, 21769 Lamstedt	36:54	101	0:31	8:27
IP22	Auf der Stroth 24, 21769 Lamstedt	34:08	117	0:27	7:36
IP23	Auf der Stroth 20, 21769 Lamstedt	34:38	96	0:32	7:54
IP24	Auf der Stroth 23, 21769 Lamstedt	29:22	92	0:30	6:43
IP25	Auf der Stroth 21, 21769 Lamstedt	33:30	98	0:31	7:39
IP26	Auf der Stroth 25, 21769 Lamstedt	27:42	90	0:28	6:20
IP27	Strother Heuweg 1, 21769 Lamstedt	26:45	104	0:28	6:01
IP28	Strother Heuweg 9, 21769 Lamstedt	24:34	81	0:30	5:33
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	5:37	36	0:14	1:14
IP31	Jochensweg 8, 21769 Lamstedt	24:00	70	0:26	5:29
IP32	Driftweg 1, 21769 Lamstedt	236:45	212	1:55	54:56
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	0:00	0	0:00	0:00

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Zusatzbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP35	Neues Moor 19, 21770 Mittelstenahe	9:32	34	0:21	0:47
IP36	Haneworth 2, 21770 Lamstedt	151:23	156	2:07	16:37
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	119:51	80	1:52	11:50

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA01	E-138 EP3 E3	0:00	0:00
WEA02	E-175 EP5	52:52	6:18
WEA03	E-175 EP5	94:33	14:02
WEA04	E-175 EP5	197:04	32:31
WEA05	E-175 EP5	229:01	35:30
WEA06	E-175 EP5	332:56	62:57
WEA07	E-175 EP5	7:47	1:23
WEA08	E-175 EP5	26:05	4:50
WEA09	E-175 EP5	252:03	56:59

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP01 - Sticht 1, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:07	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:08	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:55	21:12	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:08	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:40	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:04	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:19	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:50	20:59	19:48	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:56	07:55	08:37
	16:39	17:39	18:33	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38
	16:41	17:41	18:34	20:31	21:24	21:58	21:43	20:47	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:31	21:58	21:37	20:38	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:18	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:41	21:32	21:59	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:51	17:53	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:16	07:11	08:09	08:41
	16:53	17:55	18:47	20:44	21:35	21:59	21:33	20:31	19:16	17:05	16:14	16:08
27	08:20	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:59	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:15	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:30	20:26	19:11	17:01	16:12	16:10
29	08:17		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:57		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP02 - Neues Moor 21, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42		09:15 (WEA04)	08:12			07:15	07:00	05:51	05:02
	16:14	15	09:30 (WEA04)	17:05			18:00	19:58	20:53	21:43
2	08:41		09:15 (WEA04)	08:10			07:12	06:57	05:49	05:01
	16:15	16	09:31 (WEA04)	17:07			18:02	20:00	20:55	21:44
3	08:41		09:15 (WEA04)	08:08			07:10	06:55	05:47	05:00
	16:16	18	09:33 (WEA04)	17:09			18:04	20:02	20:57	21:45
4	08:41		09:14 (WEA04)	08:06			07:08	06:53	05:45	04:59
	16:17	19	09:33 (WEA04)	17:11			18:06	20:04	20:59	21:46
5	08:41		09:14 (WEA04)	08:05			07:05	06:50	05:43	04:59
	16:19	20	09:34 (WEA04)	17:13			18:08	20:06	21:00	21:47
6	08:40		09:13 (WEA04)	08:03			07:03	06:48	05:41	04:58
	16:20	21	09:34 (WEA04)	17:15			18:10	20:07	21:02	21:48
7	08:40		09:12 (WEA04)	08:01		08:28 (WEA05)	07:01	06:45	05:39	04:57
	16:21	23	09:35 (WEA04)	17:17	1	08:29 (WEA05)	18:12	20:09	21:04	21:49
8	08:39		09:12 (WEA04)	07:59		08:26 (WEA05)	06:58	06:43	05:37	04:57
	16:23	24	09:36 (WEA04)	17:19	5	08:31 (WEA05)	18:14	20:11	21:06	21:50
9	08:39		09:11 (WEA04)	07:57		08:24 (WEA05)	06:56	06:41	05:35	04:56
	16:24	25	09:36 (WEA04)	17:21	8	08:32 (WEA05)	18:16	20:13	21:07	21:51
10	08:38		09:10 (WEA04)	07:55		08:22 (WEA05)	06:53	06:38	05:34	04:56
	16:26	27	09:37 (WEA04)	17:23	11	08:33 (WEA05)	18:17	20:15	21:09	21:52
11	08:37		09:09 (WEA04)	07:53		08:20 (WEA05)	06:51	06:36	05:32	04:55
	16:27	28	09:37 (WEA04)	17:25	14	08:34 (WEA05)	18:19	20:17	21:11	21:53
12	08:37		09:08 (WEA04)	07:51		08:17 (WEA05)	06:49	06:34	05:30	04:55
	16:29	30	09:38 (WEA04)	17:27	17	08:34 (WEA05)	18:21	20:18	21:13	21:54
13	08:36		09:09 (WEA04)	07:49		08:15 (WEA05)	06:46	06:31	05:28	04:54
	16:30	29	09:38 (WEA04)	17:29	19	08:34 (WEA05)	18:23	20:20	21:14	21:54
14	08:35		09:09 (WEA04)	07:47		08:13 (WEA05)	06:44	06:29	05:26	04:54
	16:32	30	09:39 (WEA04)	17:31	22	08:35 (WEA05)	18:25	20:22	21:16	21:55
15	08:34		09:09 (WEA04)	07:45		08:11 (WEA05)	06:41	06:26	05:25	04:54
	16:34	30	09:39 (WEA04)	17:33	24	08:35 (WEA05)	18:27	20:24	21:18	21:56
16	08:33		09:10 (WEA04)	07:43		08:11 (WEA05)	06:39	06:24	05:23	04:54
	16:35	30	09:40 (WEA04)	17:35	24	08:35 (WEA05)	18:29	20:26	21:19	21:56
17	08:32		09:10 (WEA04)	07:41		08:12 (WEA05)	06:36	06:22	05:22	04:54
	16:37	30	09:40 (WEA04)	17:37	22	08:34 (WEA05)	18:31	20:28	21:21	21:57
18	08:31		09:10 (WEA04)	07:39		08:12 (WEA05)	06:34	06:20	05:20	04:54
	16:39	30	09:40 (WEA04)	17:39	21	08:33 (WEA05)	18:32	20:29	21:23	21:57
19	08:30		09:11 (WEA04)	07:37		08:13 (WEA05)	06:32	06:17	05:18	04:54
	16:40	29	09:40 (WEA04)	17:41	19	08:32 (WEA05)	18:34	20:31	21:24	21:57
20	08:29		09:12 (WEA04)	07:35		08:14 (WEA05)	06:29	06:15	05:17	04:54
	16:42	29	09:41 (WEA04)	17:43	17	08:31 (WEA05)	18:36	20:33	21:26	21:58
21	08:28		09:12 (WEA04)	07:33		08:16 (WEA05)	06:27	06:13	05:15	04:54
	16:44	28	09:40 (WEA04)	17:45	14	08:30 (WEA05)	18:38	20:35	21:27	21:58
22	08:26		09:13 (WEA04)	07:30		08:18 (WEA05)	06:24	06:11	05:14	04:54
	16:46	28	09:41 (WEA04)	17:47	8	08:26 (WEA05)	18:40	20:37	21:29	21:58
23	08:25		09:13 (WEA04)	07:28			06:22	06:08	05:13	04:54
	16:48	27	09:40 (WEA04)	17:49			18:42	20:39	21:30	21:58
24	08:24		09:14 (WEA04)	07:26			06:19	06:06	05:11	04:55
	16:50	26	09:40 (WEA04)	17:51			18:44	20:40	21:32	21:58
25	08:22		09:15 (WEA04)	07:24			06:17	06:04	05:10	04:55
	16:51	25	09:40 (WEA04)	17:52			18:45	20:42	21:33	21:59
26	08:21		09:16 (WEA04)	07:21			06:15	06:02	05:09	04:55
	16:53	24	09:40 (WEA04)	17:54			18:47	20:44	21:35	21:59
27	08:19		09:17 (WEA04)	07:19			06:12	06:00	05:07	04:56
	16:55	22	09:39 (WEA04)	17:56			18:49	20:46	21:36	21:58
28	08:18		09:18 (WEA04)	07:17			06:10	05:57	05:06	04:56
	16:57	19	09:37 (WEA04)	17:58			18:51	20:48	21:38	21:58
29	08:16		09:21 (WEA04)				07:07	05:55	05:05	04:57
	16:59	16	09:37 (WEA04)				19:53	20:50	21:39	21:58
30	08:15		09:23 (WEA04)				07:05	05:53	05:04	04:58
	17:01	11	09:34 (WEA04)				19:55	20:51	21:40	21:58
31	08:13		09:28 (WEA04)				07:02		05:03	
	17:03	1	09:29 (WEA04)				19:56		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		730			246					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,59			0,62					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		70			35					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP02 - Neues Moor 21, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober			November			Dezember		
1	04:58	05:38	06:32	07:24			07:22		07:51 (WEA05)	08:17		08:51 (WEA04)
	21:58	21:23	20:17	19:03			16:53	11	08:02 (WEA05)	16:09	28	09:19 (WEA04)
2	04:59	05:39	06:33	07:26			07:24		07:54 (WEA05)	08:18		08:53 (WEA04)
	21:57	21:21	20:14	19:01			16:51	8	08:02 (WEA05)	16:08	27	09:20 (WEA04)
3	05:00	05:41	06:35	07:28			07:26		07:56 (WEA05)	08:20		08:54 (WEA04)
	21:57	21:19	20:12	18:58			16:49	5	08:01 (WEA05)	16:08	25	09:19 (WEA04)
4	05:00	05:43	06:37	07:30			07:28		07:58 (WEA05)	08:21		08:56 (WEA04)
	21:56	21:17	20:09	18:56			16:47	1	07:59 (WEA05)	16:07	24	09:20 (WEA04)
5	05:01	05:44	06:39	07:32			07:30			08:23		08:58 (WEA04)
	21:56	21:15	20:07	18:54			16:45			16:06	23	09:21 (WEA04)
6	05:02	05:46	06:40	07:33			07:32			08:24		08:59 (WEA04)
	21:55	21:13	20:05	18:51			16:43			16:06	21	09:20 (WEA04)
7	05:03	05:48	06:42	07:35			07:34			08:25		09:00 (WEA04)
	21:54	21:11	20:02	18:49			16:42			16:05	20	09:20 (WEA04)
8	05:04	05:49	06:44	07:37			07:36			08:27		09:02 (WEA04)
	21:54	21:10	20:00	18:46			16:40			16:05	19	09:21 (WEA04)
9	05:05	05:51	06:46	07:39			07:38			08:28		09:03 (WEA04)
	21:53	21:08	19:57	18:44			16:38			16:05	18	09:21 (WEA04)
10	05:06	05:53	06:47	07:41			07:39			08:29		09:04 (WEA04)
	21:52	21:06	19:55	18:42			16:36			16:04	17	09:21 (WEA04)
11	05:07	05:55	06:49	07:42			07:41		08:58 (WEA04)	08:30		09:06 (WEA04)
	21:51	21:03	19:52	18:39			16:35	3	09:01 (WEA04)	16:04	16	09:22 (WEA04)
12	05:09	05:56	06:51	07:44			07:43		08:54 (WEA04)	08:31		09:07 (WEA04)
	21:50	21:01	19:50	18:37			16:33	12	09:06 (WEA04)	16:04	15	09:22 (WEA04)
13	05:10	05:58	06:53	07:46			07:45		08:52 (WEA04)	08:32		09:08 (WEA04)
	21:49	20:59	19:47	18:35			16:31	17	09:09 (WEA04)	16:04	14	09:22 (WEA04)
14	05:11	06:00	06:54	07:48			07:47		08:51 (WEA04)	08:33		09:09 (WEA04)
	21:48	20:57	19:45	18:32			16:30	19	09:10 (WEA04)	16:04	13	09:22 (WEA04)
15	05:12	06:02	06:56	07:50			07:49		08:50 (WEA04)	08:34		09:10 (WEA04)
	21:47	20:55	19:43	18:30			16:28	22	09:12 (WEA04)	16:04	12	09:22 (WEA04)
16	05:14	06:03	06:58	07:52			07:51		08:49 (WEA04)	08:35		09:11 (WEA04)
	21:46	20:53	19:40	18:28			16:27	24	09:13 (WEA04)	16:04	12	09:23 (WEA04)
17	05:15	06:05	07:00	07:54			07:53		08:49 (WEA04)	08:36		09:11 (WEA04)
	21:45	20:51	19:38	18:25			16:25	25	09:14 (WEA04)	16:04	14	10:36 (WEA03)
18	05:16	06:07	07:01	07:55			07:55		08:48 (WEA04)	08:37		09:12 (WEA04)
	21:44	20:49	19:35	18:23			16:24	26	09:14 (WEA04)	16:04	16	10:38 (WEA03)
19	05:18	06:09	07:03	07:57			07:56		08:48 (WEA04)	08:38		09:13 (WEA04)
	21:43	20:46	19:33	18:21			16:22	27	09:15 (WEA04)	16:05	17	10:40 (WEA03)
20	05:19	06:10	07:05	07:59		08:48 (WEA05)	07:58		08:48 (WEA04)	08:38		09:14 (WEA04)
	21:41	20:44	19:30	18:19	11	08:59 (WEA05)	16:21	28	09:16 (WEA04)	16:05	18	10:41 (WEA03)
21	05:20	06:12	07:07	08:01		08:46 (WEA05)	08:00		08:48 (WEA04)	08:39		09:14 (WEA04)
	21:40	20:42	19:28	18:16	15	09:01 (WEA05)	16:20	28	09:16 (WEA04)	16:05	18	10:41 (WEA03)
22	05:22	06:14	07:08	08:03		08:44 (WEA05)	08:02		08:48 (WEA04)	08:39		09:15 (WEA04)
	21:39	20:40	19:25	18:14	18	09:02 (WEA05)	16:18	29	09:17 (WEA04)	16:06	18	10:42 (WEA03)
23	05:23	06:16	07:10	08:05		08:43 (WEA05)	08:04		08:48 (WEA04)	08:40		09:15 (WEA04)
	21:37	20:37	19:23	18:12	20	09:03 (WEA05)	16:17	30	09:18 (WEA04)	16:06	18	10:42 (WEA03)
24	05:25	06:17	07:12	08:07		08:42 (WEA05)	08:05		08:48 (WEA04)	08:40		09:15 (WEA04)
	21:36	20:35	19:20	18:10	22	09:04 (WEA05)	16:16	30	09:18 (WEA04)	16:07	18	10:42 (WEA03)
25	05:26	06:19	07:14	07:09		07:41 (WEA05)	08:07		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:34	20:33	19:18	17:08	23	08:04 (WEA05)	16:15	31	09:19 (WEA04)	16:08	16	10:42 (WEA03)
26	05:28	06:21	07:15	07:11		07:41 (WEA05)	08:09		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:33	20:31	19:15	17:05	23	08:04 (WEA05)	16:14	30	09:18 (WEA04)	16:08	16	10:42 (WEA03)
27	05:30	06:23	07:17	07:13		07:41 (WEA05)	08:10		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:31	20:28	19:13	17:03	23	08:04 (WEA05)	16:13	30	09:18 (WEA04)	16:09	11	09:27 (WEA04)
28	05:31	06:24	07:19	07:14		07:43 (WEA05)	08:12		08:49 (WEA04)	08:41		09:16 (WEA04)
	21:29	20:26	19:11	17:01	21	08:04 (WEA05)	16:12	30	09:19 (WEA04)	16:10	12	09:28 (WEA04)
29	05:33	06:26	07:21	07:16		07:45 (WEA05)	08:14		08:50 (WEA04)	08:42		09:16 (WEA04)
	21:28	20:24	19:08	16:59	19	08:04 (WEA05)	16:11	29	09:19 (WEA04)	16:11	13	09:29 (WEA04)
30	05:34	06:28	07:23	07:18		07:47 (WEA05)	08:15		08:50 (WEA04)	08:42		09:16 (WEA04)
	21:26	20:21	19:06	16:57	16	08:03 (WEA05)	16:10	30	09:20 (WEA04)	16:12	13	09:29 (WEA04)
31	05:36	06:30		07:20		07:49 (WEA05)				08:42		09:16 (WEA04)
	21:24	20:19		16:55	14	08:03 (WEA05)				16:13	14	09:30 (WEA04)
Sonnenscheinstunden	511	459	382	329			260			234		
astr.max.mögl.Beschattung					225			525			536	
Red.Sonnenscheinwahrsch.					0,29			0,19			0,14	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,59			0,59	
Gesamte Reduktion					0,17			0,11			0,08	
Met.wahrsch.Beschattung					39			57			42	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP03 - Mittelstenaher Str. 30, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:41		12:46 (WEA06)	08:11		13:18 (WEA06)	07:14	07:00	05:51	05:02
	16:14	115	15:36 (WEA04)	17:05	26	13:44 (WEA06)	18:00	19:58	20:53	21:43
2	08:41		12:47 (WEA06)	08:10		13:21 (WEA06)	07:12	06:57	05:49	05:01
	16:15	116	15:38 (WEA04)	17:07	19	13:40 (WEA06)	18:02	20:00	20:55	21:44
3	08:41		12:48 (WEA06)	08:08			07:10	06:55	05:47	05:00
	16:16	116	15:39 (WEA04)	17:09			18:04	20:02	20:57	21:45
4	08:41		12:48 (WEA06)	08:06			07:07	06:53	05:45	04:59
	16:17	116	15:40 (WEA04)	17:11			18:06	20:04	20:58	21:46
5	08:40		12:49 (WEA06)	08:05			07:05	06:50	05:43	04:59
	16:19	117	15:42 (WEA04)	17:13			18:08	20:06	21:00	21:47
6	08:40		12:49 (WEA06)	08:03			07:03	06:48	05:41	04:58
	16:20	118	15:43 (WEA04)	17:15			18:10	20:07	21:02	21:48
7	08:40		12:49 (WEA06)	08:01			07:00	06:45	05:39	04:57
	16:21	118	15:44 (WEA04)	17:17			18:12	20:09	21:04	21:49
8	08:39		12:51 (WEA06)	07:59			06:58	06:43	05:37	04:57
	16:23	118	15:47 (WEA04)	17:19			18:14	20:11	21:06	21:50
9	08:39		12:51 (WEA06)	07:57			06:56	06:41	05:35	04:56
	16:24	118	15:48 (WEA04)	17:21			18:15	20:13	21:07	21:51
10	08:38		12:51 (WEA06)	07:55			06:53	06:38	05:33	04:55
	16:26	119	15:49 (WEA04)	17:23			18:17	20:15	21:09	21:52
11	08:37		12:52 (WEA06)	07:53			06:51	06:36	05:32	04:55
	16:27	119	15:51 (WEA04)	17:25			18:19	20:17	21:11	21:53
12	08:37		12:52 (WEA06)	07:51			06:48	06:33	05:30	04:55
	16:29	120	15:53 (WEA04)	17:27			18:21	20:18	21:13	21:54
13	08:36		12:53 (WEA06)	07:49			06:46	06:31	05:28	04:54
	16:30	118	15:54 (WEA04)	17:29			18:23	20:20	21:14	21:54
14	08:35		12:54 (WEA06)	07:47			06:44	06:29	05:26	04:54
	16:32	117	15:55 (WEA04)	17:31			18:25	20:22	21:16	21:55
15	08:34		12:55 (WEA06)	07:45			06:41	06:26	05:25	04:54
	16:33	112	15:55 (WEA04)	17:33			18:27	20:24	21:18	21:55
16	08:33		12:55 (WEA06)	07:43			06:39	06:24	05:23	04:54
	16:35	111	15:56 (WEA04)	17:35			18:29	20:26	21:19	21:56
17	08:32		12:56 (WEA06)	07:41			06:36	06:22	05:21	04:54
	16:37	107	15:56 (WEA04)	17:37			18:30	20:28	21:21	21:57
18	08:31		12:57 (WEA06)	07:39			06:34	06:19	05:20	04:54
	16:39	100	15:55 (WEA04)	17:39			18:32	20:29	21:23	21:57
19	08:30		12:58 (WEA06)	07:37			06:31	06:17	05:18	04:54
	16:40	95	15:56 (WEA04)	17:41			18:34	20:31	21:24	21:57
20	08:29		12:59 (WEA06)	07:35			06:29	06:15	05:17	04:54
	16:42	82	15:56 (WEA04)	17:43			18:36	20:33	21:26	21:58
21	08:28		12:59 (WEA06)	07:32			06:27	06:13	05:15	04:54
	16:44	80	15:55 (WEA04)	17:45			18:38	20:35	21:27	21:58
22	08:26		13:01 (WEA06)	07:30			06:24	06:10	05:14	04:54
	16:46	78	15:56 (WEA04)	17:46			18:40	20:37	21:29	21:58
23	08:25		13:01 (WEA06)	07:28			06:22	06:08	05:12	04:54
	16:48	75	15:55 (WEA04)	17:48			18:42	20:39	21:30	21:58
24	08:24		13:03 (WEA06)	07:26			06:19	06:06	05:11	04:54
	16:49	70	15:54 (WEA04)	17:50			18:43	20:40	21:32	21:58
25	08:22		13:04 (WEA06)	07:24			06:17	06:04	05:10	04:55
	16:51	66	15:53 (WEA04)	17:52			18:45	20:42	21:33	21:58
26	08:21		13:06 (WEA06)	07:21			06:14	06:02	05:09	04:55
	16:53	61	15:52 (WEA04)	17:54			18:47	20:44	21:35	21:58
27	08:19		13:07 (WEA06)	07:19			06:12	05:59	05:07	04:56
	16:55	54	15:50 (WEA04)	17:56			18:49	20:46	21:36	21:58
28	08:18		13:08 (WEA06)	07:17			06:10	05:57	05:06	04:56
	16:57	43	13:51 (WEA06)	17:58			18:51	20:48	21:38	21:58
29	08:16		13:11 (WEA06)				07:07	05:55	05:05	04:57
	16:59	39	13:50 (WEA06)				19:53	20:49	21:39	21:58
30	08:15		13:13 (WEA06)				07:05	05:53	05:04	04:57
	17:01	36	13:49 (WEA06)				19:54	20:51	21:40	21:58
31	08:13		13:15 (WEA06)				07:02		05:03	
	17:03	31	13:46 (WEA06)				19:56		21:41	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		2885			45					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,65			0,64					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		303			6					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP03 - Mittelstenaher Str. 30, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November		Dezember			
1	04:58		05:38		06:31		07:24		07:22			08:17		12:34 (WEA06)
	21:57		21:23		20:16		19:03		16:53			16:09	119	15:33 (WEA04)
2	04:59		05:39		06:33		07:26		07:24			08:18		12:34 (WEA06)
	21:57		21:21		20:14		19:01		16:51			16:08	119	15:33 (WEA04)
3	05:00		05:41		06:35		07:28		07:26			08:20		12:34 (WEA06)
	21:57		21:19		20:12		18:58		16:49			16:08	118	15:31 (WEA04)
4	05:00		05:43		06:37		07:30		07:28			08:21		12:35 (WEA06)
	21:56		21:17		20:09		18:56		16:47			16:07	118	15:31 (WEA04)
5	05:01		05:44		06:38		07:31		07:30			08:22		12:34 (WEA06)
	21:56		21:15		20:07		18:53		16:45			16:06	119	15:30 (WEA04)
6	05:02		05:46		06:40		07:33		07:32			08:24		12:35 (WEA06)
	21:55		21:13		20:04		18:51		16:43			16:06	118	15:29 (WEA04)
7	05:03		05:48		06:42		07:35		07:34			08:25		12:35 (WEA06)
	21:54		21:11		20:02		18:49		16:42			16:05	117	15:28 (WEA04)
8	05:04		05:49		06:44		07:37		07:36		12:59 (WEA06)	08:26		12:36 (WEA06)
	21:54		21:09		20:00		18:46		16:40	6	13:05 (WEA06)	16:05	117	15:28 (WEA04)
9	05:05		05:51		06:45		07:39		07:37		12:52 (WEA06)	08:28		12:36 (WEA06)
	21:53		21:07		19:57		18:44		16:38	19	13:11 (WEA06)	16:05	117	15:28 (WEA04)
10	05:06		05:53		06:47		07:41		07:39		12:48 (WEA06)	08:29		12:36 (WEA06)
	21:52		21:05		19:55		18:41		16:36	27	13:15 (WEA06)	16:04	116	15:27 (WEA04)
11	05:07		05:55		06:49		07:42		07:41		12:45 (WEA06)	08:30		12:36 (WEA06)
	21:51		21:03		19:52		18:39		16:34	32	13:17 (WEA06)	16:04	116	15:26 (WEA04)
12	05:08		05:56		06:51		07:44		07:43		12:43 (WEA06)	08:31		12:38 (WEA06)
	21:50		21:01		19:50		18:37		16:33	37	13:20 (WEA06)	16:04	115	15:27 (WEA04)
13	05:10		05:58		06:52		07:46		07:45		12:43 (WEA06)	08:32		12:38 (WEA06)
	21:49		20:59		19:47		18:34		16:31	39	13:22 (WEA06)	16:04	114	15:27 (WEA04)
14	05:11		06:00		06:54		07:48		07:47		12:41 (WEA06)	08:33		12:38 (WEA06)
	21:48		20:57		19:45		18:32		16:30	43	13:24 (WEA06)	16:04	114	15:27 (WEA04)
15	05:12		06:02		06:56		07:50		07:49		12:40 (WEA06)	08:34		12:39 (WEA06)
	21:47		20:55		19:42		18:30		16:28	54	15:23 (WEA04)	16:04	114	15:27 (WEA04)
16	05:13		06:03		06:58		07:52		07:51		12:39 (WEA06)	08:35		12:39 (WEA06)
	21:46		20:53		19:40		18:27		16:26	61	15:25 (WEA04)	16:04	114	15:27 (WEA04)
17	05:15		06:05		06:59		07:53		07:53		12:38 (WEA06)	08:36		12:39 (WEA06)
	21:45		20:51		19:37		18:25		16:25	67	15:27 (WEA04)	16:04	113	15:26 (WEA04)
18	05:16		06:07		07:01		07:55		07:54		12:37 (WEA06)	08:37		12:40 (WEA06)
	21:44		20:49		19:35		18:23		16:24	71	15:28 (WEA04)	16:04	112	15:26 (WEA04)
19	05:18		06:09		07:03		07:57		07:56		12:36 (WEA06)	08:37		12:40 (WEA06)
	21:42		20:46		19:33		18:21		16:22	75	15:30 (WEA04)	16:04	113	15:27 (WEA04)
20	05:19		06:10		07:05		07:59		07:58		12:36 (WEA06)	08:38		12:40 (WEA06)
	21:41		20:44		19:30		18:18		16:21	78	15:31 (WEA04)	16:05	113	15:27 (WEA04)
21	05:20		06:12		07:06		08:01		08:00		12:35 (WEA06)	08:39		12:41 (WEA06)
	21:40		20:42		19:28		18:16		16:19	80	15:31 (WEA04)	16:05	111	15:27 (WEA04)
22	05:22		06:14		07:08		08:03		08:02		12:35 (WEA06)	08:39		12:41 (WEA06)
	21:38		20:40		19:25		18:14		16:18	82	15:32 (WEA04)	16:06	111	15:27 (WEA04)
23	05:23		06:16		07:10		08:05		08:03		12:35 (WEA06)	08:40		12:42 (WEA06)
	21:37		20:37		19:23		18:12		16:17	95	15:33 (WEA04)	16:06	113	15:29 (WEA04)
24	05:25		06:17		07:12		08:07		08:05		12:35 (WEA06)	08:40		12:42 (WEA06)
	21:36		20:35		19:20		18:10		16:16	101	15:34 (WEA04)	16:07	113	15:29 (WEA04)
25	05:26		06:19		07:14		07:09		08:07		12:34 (WEA06)	08:41		12:43 (WEA06)
	21:34		20:33		19:18		17:07		16:15	105	15:33 (WEA04)	16:07	111	15:29 (WEA04)
26	05:28		06:21		07:15		07:11		08:09		12:34 (WEA06)	08:41		12:44 (WEA06)
	21:33		20:30		19:15		17:05		16:14	110	15:34 (WEA04)	16:08	113	15:31 (WEA04)
27	05:29		06:23		07:17		07:12		08:10		12:34 (WEA06)	08:41		12:44 (WEA06)
	21:31		20:28		19:13		17:03		16:13	112	15:34 (WEA04)	16:09	113	15:31 (WEA04)
28	05:31		06:24		07:19		07:14		08:12		12:34 (WEA06)	08:41		12:45 (WEA06)
	21:29		20:26		19:10		17:01		16:12	116	15:35 (WEA04)	16:10	112	15:32 (WEA04)
29	05:33		06:26		07:21		07:16		08:13		12:34 (WEA06)	08:41		12:45 (WEA06)
	21:28		20:23		19:08		16:59		16:11	119	15:36 (WEA04)	16:11	114	15:33 (WEA04)
30	05:34		06:28		07:22		07:18		08:15		12:34 (WEA06)	08:41		12:46 (WEA06)
	21:26		20:21		19:06		16:57		16:10	120	15:34 (WEA04)	16:12	114	15:34 (WEA04)
31	05:36		06:30				07:20					08:41		12:46 (WEA06)
	21:24		20:19				16:55					16:13	115	15:36 (WEA04)
Sonnenscheinstunden	511		459		382		329		260			234		
astr.max.mögl.Beschattung										1649			3556	
Red.Sonnenscheinwahrsch.										0,19			0,14	
Reduktion Betriebsdauer										0,95			0,95	
Reduktion Windrichtung										0,65			0,65	
Gesamte Reduktion										0,12			0,09	
Met.wahrsch.Beschattung										196			308	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP04 - Wischhofstraße 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		16:49 (WEA09)	07:00		18:53 (WEA05)	05:51	05:02
	16:14		17:05		18:00	34	17:23 (WEA09)	19:58	38	19:31 (WEA05)	20:53	21:43
2	08:41		08:10		07:12		16:49 (WEA09)	06:57		18:52 (WEA05)	05:49	05:01
	16:15		17:07		18:02	32	17:21 (WEA09)	20:00	41	19:33 (WEA05)	20:55	21:44
3	08:41		08:08		07:10		16:50 (WEA09)	06:55		18:51 (WEA05)	05:47	05:00
	16:16		17:09		18:04	31	17:21 (WEA09)	20:02	42	19:33 (WEA05)	20:57	21:45
4	08:41		08:06		07:07		16:51 (WEA09)	06:52		18:50 (WEA05)	05:45	04:59
	16:17		17:11		18:06	29	17:20 (WEA09)	20:04	44	19:34 (WEA05)	20:58	21:46
5	08:40		08:04		07:05		16:51 (WEA09)	06:50		18:50 (WEA05)	05:43	04:59
	16:19		17:13		18:08	28	17:19 (WEA09)	20:05	44	19:34 (WEA05)	21:00	21:47
6	08:40		08:03		07:03		16:52 (WEA09)	06:48		18:48 (WEA05)	05:41	04:58
	16:20		17:15		18:10	26	17:18 (WEA09)	20:07	46	19:34 (WEA05)	21:02	21:48
7	08:40		08:01		07:00		16:53 (WEA09)	06:45		18:48 (WEA05)	05:39	04:57
	16:21		17:17		18:12	22	17:15 (WEA09)	20:09	46	19:34 (WEA05)	21:04	21:49
8	08:39		07:59		06:58		16:56 (WEA09)	06:43		18:48 (WEA05)	05:37	04:57
	16:23		17:19		18:14	17	17:13 (WEA09)	20:11	46	19:34 (WEA05)	21:06	21:50
9	08:38		07:57		06:56		17:00 (WEA09)	06:40		18:47 (WEA05)	05:35	04:56
	16:24		17:21		18:15	10	17:10 (WEA09)	20:13	46	19:33 (WEA05)	21:07	21:51
10	08:38		07:55		06:53			06:38		18:47 (WEA05)	05:33	04:56
	16:26		17:23		18:17			20:15	46	19:33 (WEA05)	21:09	21:52
11	08:37		07:53		06:51			06:36		18:47 (WEA05)	05:32	04:55
	16:27		17:25		18:19			20:16	46	19:33 (WEA05)	21:11	21:53
12	08:36		07:51		06:48		17:52 (WEA04)	06:33		18:47 (WEA05)	05:30	04:55
	16:29		17:27		18:21	2	17:54 (WEA04)	20:18	45	19:32 (WEA05)	21:12	21:53
13	08:36		07:49		06:46		17:49 (WEA04)	06:31		18:47 (WEA05)	05:28	04:54
	16:30		17:29		18:23	8	17:57 (WEA04)	20:20	45	19:32 (WEA05)	21:14	21:54
14	08:35		07:47		06:44		17:47 (WEA04)	06:29		18:47 (WEA05)	05:26	04:54
	16:32		17:31		18:25	11	17:58 (WEA04)	20:22	45	19:32 (WEA05)	21:16	21:55
15	08:34		07:45		06:41		17:46 (WEA04)	06:26		18:47 (WEA05)	05:25	04:54
	16:33		17:33		18:27	14	18:00 (WEA04)	20:24	43	19:30 (WEA05)	21:18	21:55
16	08:33		07:43	17:00 (WEA09)	06:39		17:44 (WEA04)	06:24		18:48 (WEA05)	05:23	04:54
	16:35		17:35	6 17:06 (WEA09)	18:29	18	18:02 (WEA04)	20:26	41	19:29 (WEA05)	21:19	21:56
17	08:32		07:41	16:57 (WEA09)	06:36		17:44 (WEA04)	06:22		18:48 (WEA05)	05:21	04:54
	16:37		17:37	10 17:07 (WEA09)	18:30	20	18:04 (WEA04)	20:27	41	19:29 (WEA05)	21:21	21:56
18	08:31		07:39	16:55 (WEA09)	06:34		17:43 (WEA04)	06:19		18:49 (WEA05)	05:20	04:54
	16:39		17:39	15 17:10 (WEA09)	18:32	23	18:06 (WEA04)	20:29	39	19:28 (WEA05)	21:22	21:57
19	08:30		07:37	16:54 (WEA09)	06:31		17:42 (WEA04)	06:17		18:49 (WEA05)	05:18	04:54
	16:40		17:41	18 17:12 (WEA09)	18:34	26	18:08 (WEA04)	20:31	37	19:26 (WEA05)	21:24	21:57
20	08:29		07:35	16:53 (WEA09)	06:29		17:42 (WEA04)	06:15		18:51 (WEA05)	05:17	04:54
	16:42		17:43	22 17:15 (WEA09)	18:36	28	18:10 (WEA04)	20:33	34	19:25 (WEA05)	21:26	21:58
21	08:27		07:32	16:51 (WEA09)	06:27		17:42 (WEA04)	06:13		18:52 (WEA05)	05:15	04:54
	16:44		17:45	25 17:16 (WEA09)	18:38	28	18:10 (WEA04)	20:35	31	19:23 (WEA05)	21:27	21:58
22	08:26		07:30	16:51 (WEA09)	06:24		17:42 (WEA04)	06:10		18:54 (WEA05)	05:14	04:54
	16:46		17:46	27 17:18 (WEA09)	18:40	28	18:10 (WEA04)	20:37	28	19:22 (WEA05)	21:29	21:58
23	08:25		07:28	16:50 (WEA09)	06:22		17:42 (WEA04)	06:08		18:56 (WEA05)	05:12	04:54
	16:48		17:48	31 17:21 (WEA09)	18:42	26	18:08 (WEA04)	20:38	24	19:20 (WEA05)	21:30	21:58
24	08:24		07:26	16:50 (WEA09)	06:19		17:43 (WEA04)	06:06		18:58 (WEA05)	05:11	04:54
	16:49		17:50	33 17:23 (WEA09)	18:43	25	18:08 (WEA04)	20:40	19	19:17 (WEA05)	21:32	21:58
25	08:22		07:23	16:49 (WEA09)	06:17		17:43 (WEA04)	06:04		19:02 (WEA05)	05:10	04:55
	16:51		17:52	34 17:23 (WEA09)	18:45	23	18:06 (WEA04)	20:42	11	19:13 (WEA05)	21:33	21:58
26	08:21		07:21	16:49 (WEA09)	06:14		17:44 (WEA04)	06:02			05:09	04:55
	16:53		17:54	34 17:23 (WEA09)	18:47	34	18:21 (WEA05)	20:44			21:35	21:58
27	08:19		07:19	16:49 (WEA09)	06:12		17:45 (WEA04)	05:59			05:07	04:56
	16:55		17:56	35 17:24 (WEA09)	18:49	36	18:22 (WEA05)	20:46			21:36	21:58
28	08:18		07:17	16:49 (WEA09)	06:10		17:48 (WEA04)	05:57			05:06	04:56
	16:57		17:58	34 17:23 (WEA09)	18:51	35	18:24 (WEA05)	20:48			21:37	21:58
29	08:16				07:07		18:59 (WEA05)	05:55			05:05	04:57
	16:59				19:53	28	19:27 (WEA05)	20:49			21:39	21:58
30	08:15				07:05		18:56 (WEA05)	05:53			05:04	04:57
	17:01				19:54	32	19:28 (WEA05)	20:51			21:40	21:58
31	08:13				07:02		18:55 (WEA05)				05:03	
	17:03				19:56	35	19:30 (WEA05)				21:41	
Sonnenscheinstunden	251		274		367			420			493	509
astr.max.mögl.Beschattung				324		709			968			
Red.Sonnenscheinwahrsch.				0,24		0,28			0,37			
Reduktion Betriebsdauer				0,95		0,95			0,95			
Reduktion Windrichtung				0,67		0,66			0,65			
Gesamte Reduktion				0,15		0,17			0,23			
Met.wahrsch.Beschattung				49		123			222			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP04 - Wischhofstraße 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September			Oktober			November	Dezember
1	04:58		05:38			06:31		18:46 (WEA05)	07:24		18:29 (WEA04)	07:22	08:17
	21:57		21:22			20:16	46	19:32 (WEA05)	19:03	5	18:34 (WEA04)	16:53	16:09
2	04:59		05:39			06:33		18:45 (WEA05)	07:26			07:24	08:18
	21:57		21:21			20:14	46	19:31 (WEA05)	19:01			16:51	16:08
3	05:00		05:41			06:35		18:45 (WEA05)	07:28			07:26	08:20
	21:57		21:19			20:12	46	19:31 (WEA05)	18:58			16:49	16:08
4	05:00		05:43			06:37		18:45 (WEA05)	07:30		17:40 (WEA09)	07:28	08:21
	21:56		21:17			20:09	46	19:31 (WEA05)	18:56	3	17:43 (WEA09)	16:47	16:07
5	05:01		05:44			06:38		18:44 (WEA05)	07:31		17:34 (WEA09)	07:30	08:22
	21:56		21:15			20:07	46	19:30 (WEA05)	18:53	15	17:49 (WEA09)	16:45	16:06
6	05:02		05:46			06:40		18:44 (WEA05)	07:33		17:31 (WEA09)	07:32	08:24
	21:55		21:13			20:04	46	19:30 (WEA05)	18:51	20	17:51 (WEA09)	16:43	16:06
7	05:03		05:48			06:42		18:45 (WEA05)	07:35		17:29 (WEA09)	07:34	08:25
	21:54		21:11			20:02	44	19:29 (WEA05)	18:49	24	17:53 (WEA09)	16:42	16:05
8	05:04		05:49			06:44		18:44 (WEA05)	07:37		17:27 (WEA09)	07:35	08:26
	21:54		21:09			20:00	44	19:28 (WEA05)	18:46	26	17:53 (WEA09)	16:40	16:05
9	05:05		05:51			06:45		18:45 (WEA05)	07:39		17:25 (WEA09)	07:37	08:28
	21:53		21:07			19:57	42	19:27 (WEA05)	18:44	29	17:54 (WEA09)	16:38	16:05
10	05:06		05:53			06:47		18:45 (WEA05)	07:41		17:24 (WEA09)	07:39	08:29
	21:52		21:05			19:55	41	19:26 (WEA05)	18:41	31	17:55 (WEA09)	16:36	16:04
11	05:07		05:55			06:49		18:46 (WEA05)	07:42		17:23 (WEA09)	07:41	08:30
	21:51		21:03			19:52	39	19:25 (WEA05)	18:39	32	17:55 (WEA09)	16:34	16:04
12	05:09		05:56			06:51		18:46 (WEA05)	07:44		17:23 (WEA09)	07:43	08:31
	21:50		21:01			19:50	36	19:22 (WEA05)	18:37	33	17:56 (WEA09)	16:33	16:04
13	05:10		05:58			06:52		18:47 (WEA05)	07:46		17:22 (WEA09)	07:45	08:32
	21:49		20:59			19:47	32	19:19 (WEA05)	18:34	34	17:56 (WEA09)	16:31	16:04
14	05:11		06:00			06:54		18:49 (WEA05)	07:48		17:22 (WEA09)	07:47	08:33
	21:48		20:57			19:45	28	19:17 (WEA05)	18:32	34	17:56 (WEA09)	16:30	16:04
15	05:12		06:02			06:56		18:38 (WEA04)	07:50		17:21 (WEA09)	07:49	08:34
	21:47		20:55			19:42	35	19:14 (WEA05)	18:30	35	17:56 (WEA09)	16:28	16:04
16	05:13		06:03			06:58		18:35 (WEA04)	07:52		17:21 (WEA09)	07:51	08:35
	21:46		20:53			19:40	36	19:12 (WEA05)	18:27	35	17:56 (WEA09)	16:26	16:04
17	05:15		06:05			06:59		18:33 (WEA04)	07:53		17:21 (WEA09)	07:53	08:36
	21:45		20:51			19:37	35	19:10 (WEA05)	18:25	34	17:55 (WEA09)	16:25	16:04
18	05:16		06:07		19:07 (WEA05)	07:01		18:30 (WEA04)	07:55		17:21 (WEA09)	07:54	08:37
	21:44		20:48	13	19:20 (WEA05)	19:35	23	18:53 (WEA04)	18:23	33	17:54 (WEA09)	16:24	16:04
19	05:18		06:09		19:03 (WEA05)	07:03		18:29 (WEA04)	07:57		17:22 (WEA09)	07:56	08:37
	21:42		20:46	20	19:23 (WEA05)	19:33	25	18:54 (WEA04)	18:21	29	17:51 (WEA09)	16:22	16:04
20	05:19		06:10		19:01 (WEA05)	07:05		18:28 (WEA04)	07:59		17:22 (WEA09)	07:58	08:38
	21:41		20:44	25	19:26 (WEA05)	19:30	27	18:55 (WEA04)	18:18	27	17:49 (WEA09)	16:21	16:05
21	05:20		06:12		18:58 (WEA05)	07:06		18:28 (WEA04)	08:01		17:23 (WEA09)	08:00	08:39
	21:40		20:42	29	19:27 (WEA05)	19:28	27	18:55 (WEA04)	18:16	24	17:47 (WEA09)	16:19	16:05
22	05:22		06:14		18:56 (WEA05)	07:08		18:26 (WEA04)	08:03		17:24 (WEA09)	08:02	08:39
	21:38		20:40	32	19:28 (WEA05)	19:25	28	18:54 (WEA04)	18:14	20	17:44 (WEA09)	16:18	16:06
23	05:23		06:16		18:55 (WEA05)	07:10		18:26 (WEA04)	08:05		17:25 (WEA09)	08:03	08:40
	21:37		20:37	35	19:30 (WEA05)	19:23	28	18:54 (WEA04)	18:12	17	17:42 (WEA09)	16:17	16:06
24	05:25		06:17		18:53 (WEA05)	07:12		18:26 (WEA04)	08:07		17:26 (WEA09)	08:05	08:40
	21:36		20:35	37	19:30 (WEA05)	19:20	26	18:52 (WEA04)	18:10	14	17:40 (WEA09)	16:16	16:07
25	05:26		06:19		18:52 (WEA05)	07:14		18:26 (WEA04)	07:09		16:28 (WEA09)	08:07	08:40
	21:34		20:33	39	19:31 (WEA05)	19:18	24	18:50 (WEA04)	17:07	9	16:37 (WEA09)	16:15	16:07
26	05:28		06:21		18:51 (WEA05)	07:15		18:25 (WEA04)	07:10		16:30 (WEA09)	08:08	08:41
	21:32		20:30	41	19:32 (WEA05)	19:15	22	18:47 (WEA04)	17:05	5	16:35 (WEA09)	16:14	16:08
27	05:29		06:23		18:49 (WEA05)	07:17		18:26 (WEA04)	07:12			08:10	08:41
	21:31		20:28	42	19:31 (WEA05)	19:13	18	18:44 (WEA04)	17:03			16:13	16:09
28	05:31		06:24		18:49 (WEA05)	07:19		18:26 (WEA04)	07:14			08:12	08:41
	21:29		20:26	43	19:32 (WEA05)	19:10	16	18:42 (WEA04)	17:01			16:12	16:10
29	05:33		06:26		18:48 (WEA05)	07:21		18:27 (WEA04)	07:16			08:13	08:41
	21:28		20:23	44	19:32 (WEA05)	19:08	13	18:40 (WEA04)	16:59			16:11	16:11
30	05:34		06:28		18:47 (WEA05)	07:22		18:28 (WEA04)	07:18			08:15	08:41
	21:26		20:21	45	19:32 (WEA05)	19:06	9	18:37 (WEA04)	16:57			16:10	16:12
31	05:36		06:30		18:46 (WEA05)				07:20				08:41
	21:24		20:19	46	19:32 (WEA05)				16:55				16:13
Sonnenscheinstunden	511		459			382			329			260	234
astr.max.mögl.Beschattung				491			974			568			
Red.Sonnenscheinwahrsch.				0,42			0,35			0,29			
Reduktion Betriebsdauer				0,95			0,95			0,95			
Reduktion Windrichtung				0,65			0,65			0,67			
Gesamte Reduktion				0,26			0,22			0,19			
Met.wahrsch.Beschattung				128			210			105			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP05 - Am Kamp 26, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April		Mai		Juni
1	08:41	08:11	07:14		07:00		19:13 (WEA05)	05:51	19:47 (WEA06) 05:02
	16:14	17:05	18:00		19:58	18	19:31 (WEA05)	20:53	30 20:17 (WEA06) 21:43
2	08:41	08:10	07:12		06:57		19:13 (WEA05)	05:49	19:48 (WEA06) 05:01
	16:15	17:07	18:02		20:00	20	19:33 (WEA05)	20:55	30 20:18 (WEA06) 21:44
3	08:41	08:08	07:10		06:55		19:12 (WEA05)	05:47	19:48 (WEA06) 05:00
	16:16	17:09	18:04		20:02	23	19:35 (WEA05)	20:57	29 20:17 (WEA06) 21:45
4	08:41	08:06	07:07		06:52		19:13 (WEA05)	05:45	19:49 (WEA06) 04:59
	16:17	17:11	18:06		20:04	21	19:34 (WEA05)	20:58	27 20:16 (WEA06) 21:46
5	08:40	08:04	07:05		06:50		19:13 (WEA05)	05:43	19:49 (WEA06) 04:59
	16:19	17:13	18:08		20:05	21	19:34 (WEA05)	21:00	26 20:15 (WEA06) 21:47
6	08:40	08:03	07:03		06:48		19:14 (WEA05)	05:41	19:50 (WEA06) 04:58
	16:20	17:15	18:10		20:07	18	19:32 (WEA05)	21:02	24 20:14 (WEA06) 21:48
7	08:39	08:01	07:00		06:45		19:15 (WEA05)	05:39	19:50 (WEA06) 04:57
	16:21	17:17	18:12		20:09	15	19:30 (WEA05)	21:04	23 20:13 (WEA06) 21:49
8	08:39	07:59	06:58		06:43		19:17 (WEA05)	05:37	19:52 (WEA06) 04:57
	16:23	17:19	18:13		20:11	10	19:27 (WEA05)	21:05	21 20:13 (WEA06) 21:50
9	08:38	07:57	06:56		06:40			05:35	19:53 (WEA06) 04:56
	16:24	17:21	18:15		20:13			21:07	18 20:11 (WEA06) 21:51
10	08:38	07:55	06:53		06:38			05:33	19:54 (WEA06) 04:55
	16:26	17:23	18:17		20:15			21:09	15 20:09 (WEA06) 21:52
11	08:37	07:53	06:51		06:36			05:32	19:58 (WEA06) 04:55
	16:27	17:25	18:19		20:16			21:11	9 20:07 (WEA06) 21:53
12	08:36	07:51	06:48		06:33			05:30	04:55
	16:29	17:27	18:21		20:18			21:12	21:53
13	08:36	07:49	06:46		06:31			05:28	04:54
	16:30	17:29	18:23		20:20			21:14	21:54
14	08:35	07:47	06:44		06:29			05:26	04:54
	16:32	17:31	18:25		20:22			21:16	21:55
15	08:34	07:45	06:41		06:26			05:25	04:54
	16:33	17:33	18:27		20:24			21:18	21:55
16	08:33	07:43	06:39		06:24			05:23	04:54
	16:35	17:35	18:29		20:26			21:19	21:56
17	08:32	07:41	06:36		06:22			05:21	04:54
	16:37	17:37	18:30		20:27			21:21	21:56
18	08:31	07:39	06:34		06:19			05:20	04:54
	16:39	17:39	18:32		20:29			21:22	21:57
19	08:30	07:37	06:31		06:17		19:58 (WEA06)	05:18	04:54
	16:40	17:41	18:34		20:31	5	20:03 (WEA06)	21:24	21:57
20	08:29	07:34	06:29		06:15		19:55 (WEA06)	05:17	04:54
	16:42	17:43	18:36		20:33	9	20:04 (WEA06)	21:26	21:58
21	08:27	07:32	06:27		06:13		19:54 (WEA06)	05:15	04:54
	16:44	17:44	18:38		20:35	12	20:06 (WEA06)	21:27	21:58
22	08:26	07:30	06:24		06:10		19:52 (WEA06)	05:14	04:54
	16:46	17:46	18:40		20:37	16	20:08 (WEA06)	21:29	21:58
23	08:25	07:28	06:22		06:08		19:51 (WEA06)	05:12	04:54
	16:48	17:48	18:42		20:38	19	20:10 (WEA06)	21:30	21:58
24	08:24	07:26	06:19		06:06		19:50 (WEA06)	05:11	04:54
	16:49	17:50	18:43		20:40	22	20:12 (WEA06)	21:32	21:58
25	08:22	07:23	06:17		06:04		19:50 (WEA06)	05:10	04:55
	16:51	17:52	18:45		20:42	24	20:14 (WEA06)	21:33	21:58
26	08:21	07:21	06:14	18:20 (WEA05)	06:02		19:48 (WEA06)	05:08	04:55
	16:53	17:54	18:47	1 18:21 (WEA05)	20:44	26	20:14 (WEA06)	21:35	21:58
27	08:19	07:19	06:12	18:17 (WEA05)	05:59		19:48 (WEA06)	05:07	04:56
	16:55	17:56	18:49	5 18:22 (WEA05)	20:46	28	20:16 (WEA06)	21:36	21:58
28	08:18	07:17	06:09	18:16 (WEA05)	05:57		19:48 (WEA06)	05:06	04:56
	16:57	17:58	18:51	8 18:24 (WEA05)	20:48	30	20:18 (WEA06)	21:37	21:58
29	08:16		07:07	19:14 (WEA05)	05:55		19:47 (WEA06)	05:05	04:57
	16:59		19:53	12 19:26 (WEA05)	20:49	31	20:18 (WEA06)	21:39	21:58
30	08:15		07:05	19:14 (WEA05)	05:53		19:47 (WEA06)	05:04	04:57
	17:01		19:54	14 19:28 (WEA05)	20:51	30	20:17 (WEA06)	21:40	21:58
31	08:13		07:02	19:14 (WEA05)				05:03	
	17:03		19:56	16 19:30 (WEA05)				21:41	
Sonnenscheinstunden	251	274	367		420			493	509
astr.max.mögl.Beschattung				56		398		252	
Red.Sonnenscheinwahrsch.				0,28		0,37		0,43	
Reduktion Betriebsdauer				0,95		0,95		0,95	
Reduktion Windrichtung				0,65		0,63		0,62	
Gesamte Reduktion				0,17		0,22		0,25	
Met.wahrsch.Beschattung				10		89		63	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP05 - Am Kamp 26, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		05:38		20:10 (WEA06)	06:31		07:24	07:22	08:17
	21:57		21:22	4	20:14 (WEA06)	20:16		19:03	16:53	16:09
2	04:59		05:39		20:06 (WEA06)	06:33		07:26	07:24	08:18
	21:57		21:21	12	20:18 (WEA06)	20:14		19:01	16:51	16:08
3	05:00		05:41		20:04 (WEA06)	06:35		07:28	07:26	08:20
	21:56		21:19	16	20:20 (WEA06)	20:12		18:58	16:49	16:08
4	05:00		05:43		20:03 (WEA06)	06:37	19:15 (WEA05)	07:30	07:28	08:21
	21:56		21:17	19	20:22 (WEA06)	20:09	10	19:25 (WEA05)	18:56	16:47	16:07
5	05:01		05:44		20:01 (WEA06)	06:38	19:11 (WEA05)	07:31	07:30	08:22
	21:55		21:15	22	20:23 (WEA06)	20:07	15	19:26 (WEA05)	18:53	16:45	16:06
6	05:02		05:46		20:00 (WEA06)	06:40	19:10 (WEA05)	07:33	07:32	08:24
	21:55		21:13	24	20:24 (WEA06)	20:04	18	19:28 (WEA05)	18:51	16:43	16:06
7	05:03		05:48		19:59 (WEA06)	06:42	19:09 (WEA05)	07:35	07:34	08:25
	21:54		21:11	25	20:24 (WEA06)	20:02	20	19:29 (WEA05)	18:49	16:41	16:05
8	05:04		05:49		19:58 (WEA06)	06:44	19:07 (WEA05)	07:37	07:35	08:26
	21:54		21:09	27	20:25 (WEA06)	19:59	21	19:28 (WEA05)	18:46	16:40	16:05
9	05:05		05:51		19:58 (WEA06)	06:45	19:06 (WEA05)	07:39	07:37	08:28
	21:53		21:07	28	20:26 (WEA06)	19:57	23	19:29 (WEA05)	18:44	16:38	16:05
10	05:06		05:53		19:57 (WEA06)	06:47	19:06 (WEA05)	07:40	07:39	08:29
	21:52		21:05	29	20:26 (WEA06)	19:55	21	19:27 (WEA05)	18:41	16:36	16:04
11	05:07		05:55		19:57 (WEA06)	06:49	19:05 (WEA05)	07:42	07:41	08:30
	21:51		21:03	29	20:26 (WEA06)	19:52	19	19:24 (WEA05)	18:39	16:34	16:04
12	05:08		05:56		19:56 (WEA06)	06:51	19:05 (WEA05)	07:44	07:43	08:31
	21:50		21:01	30	20:26 (WEA06)	19:50	17	19:22 (WEA05)	18:37	16:33	16:04
13	05:10		05:58		19:56 (WEA06)	06:52	19:05 (WEA05)	07:46	07:45	08:32
	21:49		20:59	30	20:26 (WEA06)	19:47	14	19:19 (WEA05)	18:34	16:31	16:04
14	05:11		06:00		19:56 (WEA06)	06:54	19:06 (WEA05)	07:48	07:47	08:33
	21:48		20:57	30	20:26 (WEA06)	19:45	11	19:17 (WEA05)	18:32	16:30	16:04
15	05:12		06:01		19:55 (WEA06)	06:56	19:05 (WEA05)	07:50	07:49	08:34
	21:47		20:55	30	20:25 (WEA06)	19:42	9	19:14 (WEA05)	18:30	16:28	16:04
16	05:13		06:03		19:55 (WEA06)	06:58	19:06 (WEA05)	07:52	07:51	08:35
	21:46		20:53	28	20:23 (WEA06)	19:40	6	19:12 (WEA05)	18:27	16:26	16:04
17	05:15		06:05		19:56 (WEA06)	06:59	19:08 (WEA05)	07:53	07:52	08:36
	21:45		20:51	26	20:22 (WEA06)	19:37	2	19:10 (WEA05)	18:25	16:25	16:04
18	05:16		06:07		19:55 (WEA06)	07:01			07:55	07:54	08:37
	21:44		20:48	24	20:19 (WEA06)	19:35			18:23	16:24	16:04
19	05:17		06:08		19:56 (WEA06)	07:03			07:57	07:56	08:37
	21:42		20:46	21	20:17 (WEA06)	19:32			18:21	16:22	16:04
20	05:19		06:10		19:57 (WEA06)	07:05			07:59	07:58	08:38
	21:41		20:44	18	20:15 (WEA06)	19:30			18:18	16:21	16:05
21	05:20		06:12		19:57 (WEA06)	07:06			08:01	08:00	08:39
	21:40		20:42	16	20:13 (WEA06)	19:28			18:16	16:19	16:05
22	05:22		06:14		19:58 (WEA06)	07:08			08:03	08:02	08:39
	21:38		20:40	13	20:11 (WEA06)	19:25			18:14	16:18	16:06
23	05:23		06:15		20:00 (WEA06)	07:10			08:05	08:03	08:40
	21:37		20:37	9	20:09 (WEA06)	19:23			18:12	16:17	16:06
24	05:25		06:17		20:02 (WEA06)	07:12			08:07	08:05	08:40
	21:35		20:35	4	20:06 (WEA06)	19:20			18:10	16:16	16:07
25	05:26		06:19			07:13			07:09	08:07	08:40
	21:34		20:33			19:18			17:07	16:15	16:07
26	05:28		06:21			07:15			07:10	08:08	08:41
	21:32		20:30			19:15			17:05	16:14	16:08
27	05:29		06:23			07:17			07:12	08:10	08:41
	21:31		20:28			19:13			17:03	16:13	16:09
28	05:31		06:24			07:19			07:14	08:12	08:41
	21:29		20:26			19:10			17:01	16:12	16:10
29	05:33		06:26			07:21			07:16	08:13	08:41
	21:28		20:23			19:08			16:59	16:11	16:11
30	05:34		06:28			07:22			07:18	08:15	08:41
	21:26		20:21			19:05			16:57	16:10	16:12
31	05:36		06:30						07:20		08:41
	21:24		20:19						16:55		16:13
Sonnenscheinstunden	511		459			382			329	260	234
astr.max.mögl.Beschattung				514		206					
Red.Sonnenscheinwahrsch.				0,42		0,35					
Reduktion Betriebsdauer				0,95		0,95					
Reduktion Windrichtung				0,62		0,65					
Gesamte Reduktion				0,25		0,21					
Met.wahrsch.Beschattung				127		44					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP06 - Strother Heuweg 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		07:00		19:00 (WEA09)		05:51	19:51 (WEA05)
	16:14		17:05		18:00		19:58	19	19:19 (WEA09)		20:53	28 20:19 (WEA05)
2	08:41		08:10		07:12		06:57		19:02 (WEA09)		05:49	19:51 (WEA05)
	16:15		17:07		18:02		20:00	15	19:17 (WEA09)		20:55	27 20:18 (WEA05)
3	08:41		08:08		07:10		06:55		19:04 (WEA09)		05:47	19:51 (WEA05)
	16:16		17:09		18:04		20:02	10	19:14 (WEA09)		20:57	27 20:18 (WEA05)
4	08:41		08:06		07:07		06:52				05:45	19:52 (WEA05)
	16:17		17:11		18:06		20:04				20:58	25 20:17 (WEA05)
5	08:40		08:04		07:05		06:50				05:43	19:52 (WEA05)
	16:19		17:13		18:08		20:05				21:00	24 20:16 (WEA05)
6	08:40		08:03		07:03		06:48				05:41	19:53 (WEA05)
	16:20		17:15		18:10		20:07				21:02	22 20:15 (WEA05)
7	08:40		08:01		07:00		06:45				05:39	19:53 (WEA05)
	16:21		17:17		18:12		20:09				21:04	21 20:14 (WEA05)
8	08:39		07:59		06:58		06:43				05:37	19:55 (WEA05)
	16:23		17:19		18:14		20:11				21:05	18 20:13 (WEA05)
9	08:38		07:57		06:56		06:40				05:35	19:57 (WEA05)
	16:24		17:21		18:15		20:13				21:07	14 20:11 (WEA05)
10	08:38		07:55		06:53		06:38				05:33	19:59 (WEA05)
	16:26		17:23		18:17		20:15				21:09	9 20:08 (WEA05)
11	08:37		07:53		06:51		06:36				05:32	
	16:27		17:25		18:19		20:16				21:11	
12	08:36		07:51		06:48		06:33				05:30	
	16:29		17:27		18:21		20:18				21:12	
13	08:36		07:49		06:46		06:31				05:28	
	16:30		17:29		18:23		20:20				21:14	
14	08:35		07:47		06:44		06:29				05:26	
	16:32		17:31		18:25		20:22				21:16	
15	08:34		07:45		06:41		06:26				05:25	
	16:33		17:33		18:27		20:24				21:18	
16	08:33		07:43		06:39		06:24				05:23	
	16:35		17:35		18:29		20:26				21:19	
17	08:32		07:41		06:36		06:22				05:21	
	16:37		17:37		18:30		20:27				21:21	
18	08:31		07:39		06:34		06:19				05:20	
	16:39		17:39		18:32		20:29				21:22	
19	08:30		07:37		06:31		06:17		20:01 (WEA05)		05:18	
	16:40		17:41		18:34		20:31	2	20:03 (WEA05)		21:24	
20	08:29		07:34		06:29	18:07 (WEA09)	06:15		19:58 (WEA05)		05:17	
	16:42		17:43		18:36	3 18:10 (WEA09)	20:33	6	20:04 (WEA05)		21:26	
21	08:27		07:32		06:27	18:04 (WEA09)	06:13		19:56 (WEA05)		05:15	
	16:44		17:45		18:38	7 18:11 (WEA09)	20:35	10	20:06 (WEA05)		21:27	
22	08:26		07:30		06:24	18:03 (WEA09)	06:10		19:55 (WEA05)		05:14	
	16:46		17:46		18:40	11 18:14 (WEA09)	20:37	13	20:08 (WEA05)		21:29	
23	08:25		07:28		06:22	18:01 (WEA09)	06:08		19:54 (WEA05)		05:12	
	16:48		17:48		18:42	14 18:15 (WEA09)	20:38	16	20:10 (WEA05)		21:30	
24	08:24		07:26		06:19	18:01 (WEA09)	06:06		19:53 (WEA05)		05:11	
	16:49		17:50		18:43	16 18:17 (WEA09)	20:40	19	20:12 (WEA05)		21:32	
25	08:22		07:23		06:17	17:59 (WEA09)	06:04		19:52 (WEA05)		05:10	
	16:51		17:52		18:45	20 18:19 (WEA09)	20:42	22	20:14 (WEA05)		21:33	
26	08:21		07:21		06:14	17:59 (WEA09)	06:02		19:52 (WEA05)		05:09	
	16:53		17:54		18:47	22 18:21 (WEA09)	20:44	23	20:15 (WEA05)		21:35	
27	08:19		07:19		06:12	17:58 (WEA09)	05:59		19:50 (WEA05)		05:07	
	16:55		17:56		18:49	24 18:22 (WEA09)	20:46	26	20:16 (WEA05)		21:36	
28	08:18		07:17		06:09	17:59 (WEA09)	05:57		19:50 (WEA05)		05:06	
	16:57		17:58		18:51	24 18:23 (WEA09)	20:48	28	20:18 (WEA05)		21:37	
29	08:16				07:07	18:58 (WEA09)	05:55		19:50 (WEA05)		05:05	
	16:59				19:53	24 19:22 (WEA09)	20:49	29	20:19 (WEA05)		21:39	
30	08:15				07:05	18:59 (WEA09)	05:53		19:50 (WEA05)		05:04	
	17:01				19:54	23 19:22 (WEA09)	20:51	28	20:18 (WEA05)		21:40	
31	08:13				07:02	19:00 (WEA09)					05:03	
	17:03				19:56	21 19:21 (WEA09)					21:41	
Sonnenscheinstunden	251		274		367		420		493		509	
astr.max.mögl.Beschattung					209		266		215		110	
Red.Sonnenscheinwahrsch.					0,28		0,37		0,43		0,39	
Reduktion Betriebsdauer					0,95		0,95		0,95		0,95	
Reduktion Windrichtung					0,65		0,62		0,62		0,61	
Gesamte Reduktion					0,17		0,22		0,25		0,22	
Met.wahrsch.Beschattung					36		59		54		24	

	Juni	
1	05:02	
	21:43	
	04:55	
	21:44	
	04:54	
	21:45	
	04:54	
	21:46	
	04:55	
	21:47	
	04:54	
	21:48	
	04:54	
	21:49	
	04:54	
	21:50	
	04:55	
	21:53	
	04:55	21:17 (WEA06)
1	21:53	21:18 (WEA06)
	04:54	21:15 (WEA06)
3	21:54	21:18 (WEA06)
	04:54	21:15 (WEA06)
4	21:55	21:19 (WEA06)
	04:54	21:14 (WEA06)
6	21:55	21:20 (WEA06)
	04:54	21:14 (WEA06)
6	21:56	21:20 (WEA06)
	04:54	21:14 (WEA06)
7	21:56	21:21 (WEA06)
	04:54	21:14 (WEA06)
7	21:57	21:21 (WEA06)
	04:54	21:14 (WEA06)
7	21:57	21:21 (WEA06)
	04:54	21:14 (WEA06)
8	21:58	21:22 (WEA06)
	04:54	21:14 (WEA
8	21:58	21:22 (WEA
	04:54	21:15 (WEA06)
8	21:58	21:23 (WEA06)
	04:54	21:15 (WEA06)
7	21:58	21:22 (WEA06)
	04:54	21:15 (WEA06)
7	21:58	21:22 (WEA06)
	04:55	21:16 (WEA06)
7	21:58	21:23 (WEA06)
	04:55	21:16 (WEA06)
6	21:58	21:22 (WEA06)
	04:56	21:17 (WEA06)
6	21:58	21:23 (WEA06)
	04:56	21:17 (WEA06)
5	21:58	21:22 (WEA06)
	04:57	21:19 (WEA06)
4	21:58	21:23 (WEA06)
	04:57	21:19 (WEA06)
3	21:58	21:22 (WEA06)

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP06 - Strother Heuweg 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober		November	Dezember
1	04:58		21:21 (WEA06)	05:38			06:31			07:24		07:22	08:17
	21:57	1	21:22 (WEA06)	21:22			20:16			19:03		16:53	16:09
2	04:59			05:39		20:12 (WEA05)	06:33			07:26		07:24	08:18
	21:57			21:21	3	20:15 (WEA05)	20:14			19:01		16:51	16:08
3	05:00			05:41		20:08 (WEA05)	06:35			07:28		07:26	08:20
	21:56			21:19	12	20:20 (WEA05)	20:12			18:58		16:49	16:08
4	05:00			05:43		20:07 (WEA05)	06:37			07:30		07:28	08:21
	21:56			21:17	15	20:22 (WEA05)	20:09			18:56		16:47	16:07
5	05:01			05:44		20:04 (WEA05)	06:38			07:31		07:30	08:22
	21:55			21:15	19	20:23 (WEA05)	20:07			18:53		16:45	16:06
6	05:02			05:46		20:04 (WEA05)	06:40			07:33		07:32	08:24
	21:55			21:13	20	20:24 (WEA05)	20:04			18:51		16:43	16:06
7	05:03			05:48		20:02 (WEA05)	06:42			07:35		07:34	08:25
	21:54			21:11	23	20:25 (WEA05)	20:02			18:49		16:41	16:05
8	05:04			05:49		20:01 (WEA05)	06:44			07:37		07:35	08:26
	21:54			21:09	25	20:26 (WEA05)	19:59			18:46		16:40	16:05
9	05:05			05:51		20:01 (WEA05)	06:45		18:59 (WEA09)	07:39		07:37	08:28
	21:53			21:07	26	20:27 (WEA05)	19:57	8	19:07 (WEA09)	18:44		16:38	16:05
10	05:06			05:53		20:00 (WEA05)	06:47		18:56 (WEA09)	07:40		07:39	08:29
	21:52			21:05	26	20:26 (WEA05)	19:55	14	19:10 (WEA09)	18:41		16:36	16:04
11	05:07			05:55		19:59 (WEA05)	06:49		18:53 (WEA09)	07:42		07:41	08:30
	21:51			21:03	28	20:27 (WEA05)	19:52	18	19:11 (WEA09)	18:39		16:34	16:04
12	05:08			05:56		19:58 (WEA05)	06:51		18:51 (WEA09)	07:44		07:43	08:31
	21:50			21:01	29	20:27 (WEA05)	19:50	21	19:12 (WEA09)	18:37		16:33	16:04
13	05:10			05:58		19:58 (WEA05)	06:52		18:50 (WEA09)	07:46		07:45	08:32
	21:49			20:59	29	20:27 (WEA05)	19:47	23	19:13 (WEA09)	18:34		16:31	16:04
14	05:11			06:00		19:59 (WEA05)	06:54		18:50 (WEA09)	07:48		07:47	08:33
	21:48			20:57	28	20:27 (WEA05)	19:45	23	19:13 (WEA09)	18:32		16:30	16:04
15	05:12			06:02		19:58 (WEA05)	06:56		18:48 (WEA09)	07:50		07:49	08:34
	21:47			20:55	27	20:25 (WEA05)	19:42	25	19:13 (WEA09)	18:30		16:28	16:04
16	05:13			06:03		19:58 (WEA05)	06:58		18:48 (WEA09)	07:52		07:51	08:35
	21:46			20:53	25	20:23 (WEA05)	19:40	24	19:12 (WEA09)	18:27		16:26	16:04
17	05:15			06:05		19:59 (WEA05)	06:59		18:48 (WEA09)	07:53		07:52	08:36
	21:45			20:51	23	20:22 (WEA05)	19:37	22	19:10 (WEA09)	18:25		16:25	16:04
18	05:16			06:07		19:58 (WEA05)	07:01		18:47 (WEA09)	07:55		07:54	08:37
	21:44			20:48	21	20:19 (WEA05)	19:35	20	19:07 (WEA09)	18:23		16:24	16:04
19	05:18			06:09		19:59 (WEA05)	07:03		18:47 (WEA09)	07:57		07:56	08:37
	21:42			20:46	18	20:17 (WEA05)	19:33	17	19:04 (WEA09)	18:21		16:22	16:04
20	05:19			06:10		20:00 (WEA05)	07:05		18:48 (WEA09)	07:59		07:58	08:38
	21:41			20:44	15	20:15 (WEA05)	19:30	14	19:02 (WEA09)	18:18		16:21	16:05
21	05:20			06:12		20:00 (WEA05)	07:06		18:48 (WEA09)	08:01		08:00	08:39
	21:40			20:42	13	20:13 (WEA05)	19:28	12	19:00 (WEA09)	18:16		16:19	16:05
22	05:22			06:14		20:01 (WEA05)	07:08		18:48 (WEA09)	08:03		08:02	08:39
	21:38			20:40	10	20:11 (WEA05)	19:25	9	18:57 (WEA09)	18:14		16:18	16:06
23	05:23			06:16		20:03 (WEA05)	07:10		18:50 (WEA09)	08:05		08:03	08:40
	21:37			20:37	6	20:09 (WEA05)	19:23	4	18:54 (WEA09)	18:12		16:17	16:06
24	05:25			06:17		20:05 (WEA05)	07:12			08:07		08:05	08:40
	21:35			20:35	1	20:06 (WEA05)	19:20			18:10		16:16	16:07
25	05:26			06:19			07:13			07:09		08:07	08:40
	21:34			20:33			19:18			17:07		16:15	16:07
26	05:28			06:21			07:15			07:10		08:08	08:41
	21:32			20:30			19:15			17:05		16:14	16:08
27	05:29			06:23			07:17			07:12		08:10	08:41
	21:31			20:28			19:13			17:03		16:13	16:09
28	05:31			06:24			07:19			07:14		08:12	08:41
	21:29			20:26			19:10			17:01		16:12	16:10
29	05:33			06:26			07:21			07:16		08:13	08:41
	21:28			20:23			19:08			16:59		16:11	16:11
30	05:34			06:28			07:22			07:18		08:15	08:41
	21:26			20:21			19:05			16:57		16:10	16:12
31	05:36			06:30						07:20			08:41
	21:24			20:19						16:55			16:13
Sonnenscheinstunden	511			459			382			329		260	234
astr.max.mögl.Beschattung		1			442			254					
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35					
Reduktion Betriebsdauer		0,95			0,95			0,95					
Reduktion Windrichtung		0,61			0,62			0,65					
Gesamte Reduktion		0,22			0,25			0,22					
Met.wahrsch.Beschattung		0			110			55					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP07 - Driftweg 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April		Mai		Juni	
1	08:41	08:11	07:14		07:00		19:08 (WEA02)	05:51	19:47 (WEA03)	05:02		19:29 (WEA09)
	16:14	17:05	18:00		19:58	23	19:31 (WEA02)	20:53	20:19 (WEA03)	21:43	99	21:08 (WEA04)
2	08:41	08:10	07:12		17:32 (WEA07)		06:57	19:09 (WEA02)	05:49	19:47 (WEA03)	05:01		19:30 (WEA09)
	16:15	17:07	18:02	3	17:35 (WEA07)		20:00	24	19:33 (WEA02)	20:55	31	20:18 (WEA03)	21:44	100	21:10 (WEA04)
3	08:41	08:08	07:10		17:30 (WEA07)		06:55		19:08 (WEA02)	05:47		19:47 (WEA03)	05:00		19:29 (WEA09)
	16:16	17:09	18:04	7	17:37 (WEA07)		20:02	24	19:32 (WEA02)	20:57	31	20:18 (WEA03)	21:45	101	21:10 (WEA04)
4	08:41	08:06	07:07		17:29 (WEA07)		06:53		19:09 (WEA02)	05:45		19:47 (WEA03)	04:59		19:29 (WEA09)
	16:17	17:11	18:06	10	17:39 (WEA07)		20:04	23	19:32 (WEA02)	20:58	30	20:17 (WEA03)	21:46	102	21:11 (WEA04)
5	08:40	08:05	07:05		17:27 (WEA07)		06:50		19:09 (WEA02)	05:43		19:48 (WEA03)	04:59		19:29 (WEA09)
	16:19	17:13	18:08	14	17:41 (WEA07)		20:06	22	19:31 (WEA02)	21:00	29	20:17 (WEA03)	21:47	104	21:13 (WEA04)
6	08:40	08:03	07:03		17:27 (WEA07)		06:48		19:09 (WEA02)	05:41		19:48 (WEA03)	04:58		19:29 (WEA09)
	16:20	17:15	18:10	16	17:43 (WEA07)		20:07	21	19:30 (WEA02)	21:02	28	20:16 (WEA03)	21:48	104	21:13 (WEA04)
7	08:40	08:01	07:00		17:26 (WEA07)		06:45		19:11 (WEA02)	05:39		19:48 (WEA03)	04:57		19:29 (WEA09)
	16:21	17:17	18:12	18	17:44 (WEA07)		20:09	17	19:28 (WEA02)	21:04	27	20:15 (WEA03)	21:49	105	21:14 (WEA04)
8	08:39	07:59	06:58		17:26 (WEA07)		06:43		19:13 (WEA02)	05:37		19:50 (WEA03)	04:57		19:29 (WEA09)
	16:23	17:19	18:14	21	17:47 (WEA07)		20:11	13	19:26 (WEA02)	21:06	25	20:15 (WEA03)	21:50	105	21:14 (WEA04)
9	08:38	07:57	06:56		17:26 (WEA07)		06:41		19:15 (WEA02)	05:35		19:50 (WEA03)	04:56		19:29 (WEA09)
	16:24	17:21	18:15	23	17:49 (WEA07)		20:13	7	19:22 (WEA02)	21:07	25	20:15 (WEA09)	21:51	106	21:15 (WEA04)
10	08:38	07:55	06:53		17:25 (WEA07)		06:38			05:34		19:51 (WEA03)	04:56		19:29 (WEA09)
	16:26	17:23	18:17	26	17:51 (WEA08)		20:15			21:09	28	20:19 (WEA09)	21:52	105	21:14 (WEA04)
11	08:37	07:53	06:51		17:26 (WEA07)		06:36			05:32		19:51 (WEA09)	04:55		19:29 (WEA09)
	16:27	17:25	18:19	27	17:53 (WEA08)		20:17			21:11	32	20:23 (WEA09)	21:53	106	21:15 (WEA04)
12	08:36	07:51	06:48		17:26 (WEA07)		06:33			05:30		19:48 (WEA09)	04:55		19:29 (WEA09)
	16:29	17:27	18:21	28	17:54 (WEA08)		20:18			21:12	37	20:25 (WEA09)	21:53	107	21:16 (WEA04)
13	08:36	07:49	06:46		17:25 (WEA08)		06:31			05:28		19:45 (WEA09)	04:54		19:29 (WEA09)
	16:30	17:29	18:23	32	17:57 (WEA08)		20:20			21:14	42	20:27 (WEA09)	21:54	106	21:15 (WEA04)
14	08:35	07:47	06:44		17:24 (WEA08)		06:29			05:26		19:44 (WEA09)	04:54		19:29 (WEA09)
	16:32	17:31	18:25	34	17:58 (WEA08)		20:22			21:16	45	20:29 (WEA09)	21:55	107	21:16 (WEA04)
15	08:34	07:45	06:41		17:24 (WEA08)		06:26			05:25		19:42 (WEA09)	04:54		19:29 (WEA09)
	16:34	17:33	18:27	34	17:58 (WEA08)		20:24			21:18	48	20:30 (WEA09)	21:55	107	21:16 (WEA04)
16	08:33	07:43	06:39		17:23 (WEA08)		06:24			05:23		19:41 (WEA09)	04:54		19:29 (WEA09)
	16:35	17:35	18:29	35	17:58 (WEA08)		20:26			21:19	51	20:32 (WEA09)	21:56	108	21:17 (WEA04)
17	08:32	07:41	06:36		17:23 (WEA08)		06:22			05:21		19:39 (WEA09)	04:54		19:30 (WEA09)
	16:37	17:37	18:31	35	17:58 (WEA08)		20:28			21:21	54	20:33 (WEA09)	21:56	107	21:17 (WEA04)
18	08:31	07:39	06:34		17:23 (WEA08)		06:19			05:20		19:38 (WEA09)	04:54		19:30 (WEA09)
	16:39	17:39	18:32	35	17:58 (WEA08)		20:29			21:22	57	20:35 (WEA09)	21:57	107	21:17 (WEA04)
19	08:30	07:37	06:32		17:23 (WEA08)		06:17		19:59 (WEA03)	05:18		19:37 (WEA09)	04:54		19:30 (WEA09)
	16:40	17:41	18:34	34	17:57 (WEA08)		20:31	4	20:03 (WEA03)	21:24	59	20:36 (WEA09)	21:57	107	21:17 (WEA04)
20	08:29	07:35	06:29		17:23 (WEA08)		06:15		19:56 (WEA03)	05:17		19:36 (WEA09)	04:54		19:30 (WEA09)
	16:42	17:43	18:36	34	17:57 (WEA08)		20:33	8	20:04 (WEA03)	21:26	61	20:37 (WEA09)	21:58	108	21:18 (WEA04)
21	08:27	07:32	06:27		17:23 (WEA08)		06:13		19:54 (WEA03)	05:15		19:35 (WEA09)	04:54		19:31 (WEA09)
	16:44	17:45	18:38	33	17:56 (WEA08)		20:35	12	20:06 (WEA03)	21:27	63	20:38 (WEA09)	21:58	108	21:19 (WEA09)
22	08:26	07:30	06:24		17:24 (WEA08)		06:10		19:52 (WEA03)	05:14		19:35 (WEA09)	04:54		19:31 (WEA09)
	16:46	17:47	18:40	31	17:55 (WEA08)		20:37	16	20:08 (WEA03)	21:29	69	20:54 (WEA04)	21:58	108	21:19 (WEA04)
23	08:25	07:28	06:22		17:24 (WEA08)		06:08		19:51 (WEA03)	05:13		19:33 (WEA09)	04:54		19:31 (WEA09)
	16:48	17:49	18:42	29	17:53 (WEA08)		20:39	19	20:10 (WEA03)	21:30	79	20:57 (WEA04)	21:58	108	21:19 (WEA04)
24	08:24	07:26	06:19		17:25 (WEA08)		06:06		19:50 (WEA03)	05:11		19:33 (WEA09)	04:55		19:31 (WEA09)
	16:49	17:50	18:43	27	17:52 (WEA08)		20:40	22	20:12 (WEA03)	21:32	83	20:58 (WEA04)	21:58	107	21:18 (WEA04)
25	08:22	07:24	06:17		17:26 (WEA08)		06:04		19:49 (WEA03)	05:10		19:32 (WEA09)	04:55		19:32 (WEA09)
	16:51	17:52	18:45	25	18:19 (WEA02)		20:42	25	20:14 (WEA03)	21:33	88	21:00 (WEA04)	21:58	107	21:19 (WEA04)
26	08:21	07:21	06:14		17:28 (WEA08)		06:02		19:49 (WEA03)	05:09		19:32 (WEA09)	04:55		19:32 (WEA09)
	16:53	17:54	18:47	26	18:21 (WEA02)		20:44	26	20:15 (WEA03)	21:35	89	21:01 (WEA04)	21:58	107	21:19 (WEA04)
27	08:19	07:19	06:12		17:30 (WEA08)		05:59		19:48 (WEA03)	05:07		19:31 (WEA09)	04:56		19:32 (WEA09)
	16:55	17:56	18:49	24	18:22 (WEA02)		20:46	29	20:17 (WEA03)	21:36	91	21:02 (WEA04)	21:58	108	21:20 (WEA04)
28	08:18	07:17	06:10		17:35 (WEA08)		05:57		19:48 (WEA03)	05:06		19:31 (WEA09)	04:56		19:32 (WEA09)
	16:57	17:58	18:51	17	18:24 (WEA02)		20:48	31	20:19 (WEA03)	21:37	93	21:04 (WEA04)	21:58	107	21:19 (WEA04)
29	08:16		07:07		19:11 (WEA02)		05:55		19:48 (WEA03)	05:05		19:30 (WEA09)	04:57		19:33 (WEA09)
	16:59		19:53	16	19:27 (WEA02)		20:49	31	20:19 (WEA03)	21:39	95	21:05 (WEA04)	21:58	107	21:20 (WEA04)
30	08:15		07:05		19:10 (WEA02)		05:53		19:47 (WEA03)	05:04		19:30 (WEA09)	04:57		19:33 (WEA09)
	17:01		19:54	18	19:28 (WEA02)		20:51	32	20:19 (WEA03)	21:40	96	21:06 (WEA04)	21:58	106	21:19 (WEA04)
31	08:13		07:02		19:09 (WEA02)					05:03		19:30 (WEA09)			
	17:03		19:56	21	19:30 (WEA02)					21:41	97	21:07 (WEA04)			
Sonnenscheinstunden	251	274	367				420			493			509		
astr.max.mögl.Beschattung				733			429			1715			3174		
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43			0,39		
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95		
Reduktion Windrichtung				0,65			0,63			0,62			0,62		
Gesamte Reduktion				0,17			0,22			0,25			0,23		
Met.wahrsch.Beschattung				125			96			434			722		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP07 - Driftweg 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		19:33 (WEA09) | 05:38		19:59 (WEA09) | 06:31		07:24		18:04 (WEA08) | 07:22	| 08:17
	21:57	106	21:19 (WEA04) | 21:22	36	20:35 (WEA09) | 20:16		19:03	30	18:34 (WEA08) | 16:53	| 16:09
2	04:59		19:34 (WEA09) | 05:39		20:02 (WEA09) | 06:33		07:26		18:04 (WEA07) | 07:24	| 08:18
	21:57	106	21:20 (WEA04) | 21:21	30	20:32 (WEA09) | 20:14		19:01	28	18:32 (WEA08) | 16:51	| 16:08
3	05:00		19:33 (WEA09) | 05:41		20:01 (WEA03) | 06:35		19:13 (WEA02)	28	18:03 (WEA07) | 07:26	| 08:20
	21:57	106	21:19 (WEA04) | 21:19	27	20:28 (WEA09) | 20:12	7	19:20 (WEA02)	27	18:30 (WEA08) | 16:49	| 16:08
4	05:00		19:34 (WEA09) | 05:43		20:00 (WEA03) | 06:37		19:10 (WEA02)	27	18:03 (WEA07) | 07:28	| 08:21
	21:56	105	21:19 (WEA04) | 21:17	24	20:24 (WEA03) | 20:09	13	19:23 (WEA02)	24	18:27 (WEA07) | 16:47	| 16:07
5	05:01		19:35 (WEA09) | 05:44		19:59 (WEA03) | 06:38		19:07 (WEA02)	24	18:03 (WEA07) | 07:30	| 08:22
	21:56	104	21:19 (WEA04) | 21:15	25	20:24 (WEA03) | 20:07	17	19:24 (WEA02)	22	18:25 (WEA07) | 16:45	| 16:06
6	05:02		19:35 (WEA09) | 05:46		19:58 (WEA03) | 06:40		19:06 (WEA02)	22	18:03 (WEA07) | 07:32	| 08:24
	21:55	104	21:19 (WEA04) | 21:13	28	20:26 (WEA03) | 20:04	20	19:26 (WEA02)	20	18:23 (WEA07) | 16:43	| 16:06
7	05:03		19:36 (WEA09) | 05:48		19:57 (WEA03) | 06:42		19:05 (WEA02)	20	18:03 (WEA07) | 07:34	| 08:25
	21:54	103	21:19 (WEA04) | 21:11	28	20:25 (WEA03) | 20:02	21	19:26 (WEA02)	17	18:20 (WEA07) | 16:42	| 16:05
8	05:04		19:36 (WEA09) | 05:49		19:57 (WEA03) | 06:44		19:03 (WEA02)	17	18:02 (WEA07) | 07:36	| 08:26
	21:54	103	21:19 (WEA04) | 21:09	29	20:26 (WEA03) | 20:00	23	19:26 (WEA02)	15	18:17 (WEA07) | 16:40	| 16:05
9	05:05		19:37 (WEA09) | 05:51		19:57 (WEA03) | 06:45		19:02 (WEA02)	15	18:03 (WEA07) | 07:37	| 08:28
	21:53	101	21:18 (WEA04) | 21:07	30	20:27 (WEA03) | 19:57	25	19:27 (WEA02)	12	18:15 (WEA07) | 16:38	| 16:05
10	05:06		19:37 (WEA09) | 05:53		19:56 (WEA03) | 06:47		19:02 (WEA02)	12	18:03 (WEA07) | 07:39	| 08:29
	21:52	101	21:18 (WEA04) | 21:05	31	20:27 (WEA03) | 19:55	25	19:27 (WEA02)	9	18:12 (WEA07) | 16:36	| 16:04
11	05:07		19:37 (WEA09) | 05:55		19:56 (WEA03) | 06:49		19:02 (WEA02)	9	18:05 (WEA07) | 07:41	| 08:30
	21:51	100	21:17 (WEA04) | 21:03	31	20:27 (WEA03) | 19:52	23	19:25 (WEA02)	5	18:10 (WEA07) | 16:35	| 16:04
12	05:09		19:38 (WEA09) | 05:56		19:56 (WEA03) | 06:51		19:01 (WEA02)	5	18:07 (WEA07) | 07:43	| 08:31
	21:50	98	21:16 (WEA04) | 21:01	31	20:27 (WEA03) | 19:50	21	19:22 (WEA02)	1	18:08 (WEA07) | 16:33	| 16:04
13	05:10		19:38 (WEA09) | 05:58		19:55 (WEA03) | 06:52		19:01 (WEA02) | 07:46			| 07:45	| 08:32
	21:49	97	21:15 (WEA04) | 20:59	32	20:27 (WEA03) | 19:47	18	19:19 (WEA02) | 18:34			| 16:31	| 16:04
14	05:11		19:39 (WEA09) | 06:00		19:55 (WEA03) | 06:54		19:01 (WEA02) | 07:48			| 07:47	| 08:33
	21:48	95	21:14 (WEA04) | 20:57	32	20:27 (WEA03) | 19:45	16	19:17 (WEA02) | 18:32			| 16:30	| 16:04
15	05:12		19:39 (WEA09) | 06:02		19:55 (WEA03) | 06:56		19:01 (WEA02) | 07:50			| 07:49	| 08:34
	21:47	94	21:13 (WEA04) | 20:55	30	20:25 (WEA03) | 19:42	13	19:14 (WEA02) | 18:30			| 16:28	| 16:04
16	05:14		19:41 (WEA09) | 06:03		19:55 (WEA03) | 06:58		18:20 (WEA08) | 07:52			| 07:51	| 08:35
	21:46	92	21:13 (WEA04) | 20:53	28	20:23 (WEA03) | 19:40	24	19:12 (WEA02) | 18:27			| 16:27	| 16:04
17	05:15		19:41 (WEA09) | 06:05		19:56 (WEA03) | 06:59		18:17 (WEA08) | 07:53			| 07:53	| 08:36
	21:45	90	21:11 (WEA04) | 20:51	26	20:22 (WEA03) | 19:37	26	19:10 (WEA02) | 18:25			| 16:25	| 16:04
18	05:16		19:41 (WEA09) | 06:07		19:55 (WEA03) | 07:01		18:15 (WEA08) | 07:55			| 07:54	| 08:37
	21:44	89	21:10 (WEA04) | 20:48	24	20:19 (WEA03) | 19:35	26	19:08 (WEA02) | 18:23			| 16:24	| 16:04
19	05:18		19:42 (WEA09) | 06:09		19:56 (WEA03) | 07:03		18:12 (WEA08) | 07:57			| 07:56	| 08:37
	21:42	86	21:09 (WEA04) | 20:46	21	20:17 (WEA03) | 19:33	26	18:38 (WEA08) | 18:21			| 16:22	| 16:05
20	05:19		19:43 (WEA09) | 06:10		19:57 (WEA03) | 07:05		18:11 (WEA08) | 07:59			| 07:58	| 08:38
	21:41	81	21:08 (WEA04) | 20:44	18	20:15 (WEA03) | 19:30	29	18:40 (WEA08) | 18:18			| 16:21	| 16:05
21	05:20		19:44 (WEA09) | 06:12		19:57 (WEA03) | 07:06		18:09 (WEA08) | 08:01			| 08:00	| 08:39
	21:40	76	21:07 (WEA04) | 20:42	16	20:13 (WEA03) | 19:28	31	18:40 (WEA08) | 18:16			| 16:20	| 16:05
22	05:22		19:44 (WEA09) | 06:14		19:59 (WEA03) | 07:08		18:08 (WEA08) | 08:03			| 08:02	| 08:39
	21:38	64	20:48 (WEA09) | 20:40	12	20:11 (WEA03) | 19:25	32	18:40 (WEA08) | 18:14			| 16:18	| 16:06
23	05:23		19:46 (WEA09) | 06:16		20:01 (WEA03) | 07:10		18:07 (WEA08) | 08:05			| 08:03	| 08:40
	21:37	62	20:48 (WEA09) | 20:37	8	20:09 (WEA03) | 19:23	33	18:40 (WEA08) | 18:12			| 16:17	| 16:06
24	05:25		19:46 (WEA09) | 06:17		20:03 (WEA03) | 07:12		18:06 (WEA08) | 08:07			| 08:05	| 08:40
	21:36	61	20:47 (WEA09) | 20:35	3	20:06 (WEA03) | 19:20	35	18:41 (WEA08) | 18:10			| 16:16	| 16:07
25	05:26		19:48 (WEA09) | 06:19		| 07:14		18:06 (WEA08) | 07:09			| 08:07	| 08:40
	21:34	58	20:46 (WEA09) | 20:33		| 19:18	35	18:41 (WEA08) | 17:07			| 16:15	| 16:08
26	05:28		19:49 (WEA09) | 06:21		| 07:15		18:06 (WEA08) | 07:10			| 08:09	| 08:41
	21:32	56	20:45 (WEA09) | 20:30		| 19:15	35	18:41 (WEA08) | 17:05			| 16:14	| 16:08
27	05:30		19:50 (WEA09) | 06:23		| 07:17		18:04 (WEA08) | 07:12			| 08:10	| 08:41
	21:31	53	20:43 (WEA09) | 20:28		| 19:13	36	18:40 (WEA08) | 17:03			| 16:13	| 16:09
28	05:31		19:52 (WEA09) | 06:24		| 07:19		18:04 (WEA08) | 07:14			| 08:12	| 08:41
	21:29	50	20:42 (WEA09) | 20:26		| 19:10	35	18:39 (WEA08) | 17:01			| 16:12	| 16:10
29	05:33		19:53 (WEA09) | 06:26		| 07:21		18:05 (WEA08) | 07:16			| 08:13	| 08:41
	21:28	47	20:40 (WEA09) | 20:23		| 19:08	34	18:39 (WEA08) | 16:59			| 16:11	| 16:11
30	05:34		19:55 (WEA09) | 06:28		| 07:22		18:05 (WEA08) | 07:18			| 08:15	| 08:41
	21:26	44	20:39 (WEA09) | 20:21		| 19:06	32	18:37 (WEA08) | 16:57			| 16:10	| 16:12
31	05:36		19:56 (WEA09) | 06:30		|		| 07:20			|	| 08:41
	21:24	40	20:36 (WEA09) | 20:19		|		| 16:55			|	| 16:13
Sonnenscheinstunden	511		459		382		329		260	234
astr.max.mögl.Beschattung		2572		600		711		210		
Red.Sonnenscheinwahrsch.		0,38		0,42		0,35		0,29		
Reduktion Betriebsdauer		0,95		0,95		0,95		0,95		
Reduktion Windrichtung		0,62		0,62		0,65		0,65		
Gesamte Reduktion		0,22		0,25		0,22		0,18		
Met.wahrsch.Beschattung		573		149		153		38		

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April	Mai	Juni
1	08:41		09:23 (WEA05)	08:12		09:28 (WEA05)	07:14	07:39 (WEA06)	07:00	05:51	05:02
	16:14	138	15:19 (WEA02)	17:05	53	10:21 (WEA05)	18:00	18	07:57 (WEA06)	19:58	20:53	21:43
2	08:41		09:23 (WEA05)	08:10		09:28 (WEA05)	07:12		07:37 (WEA06)	06:57	05:49	05:01
	16:15	137	15:19 (WEA02)	17:07	52	10:20 (WEA05)	18:02	23	08:00 (WEA06)	20:00	20:55	21:44
3	08:41		09:24 (WEA05)	08:08		09:29 (WEA05)	07:10		07:34 (WEA06)	06:55	05:47	05:00
	16:16	135	15:20 (WEA02)	17:09	51	10:20 (WEA05)	18:04	27	08:01 (WEA06)	20:02	20:57	21:45
4	08:41		09:23 (WEA05)	08:06		09:31 (WEA05)	07:08		07:32 (WEA06)	06:53	05:45	04:59
	16:17	136	15:20 (WEA02)	17:11	49	10:20 (WEA05)	18:06	31	08:03 (WEA06)	20:04	20:59	21:46
5	08:40		09:24 (WEA05)	08:05		09:31 (WEA05)	07:05		07:29 (WEA06)	06:50	05:43	04:59
	16:19	134	15:20 (WEA02)	17:13	48	10:19 (WEA05)	18:08	34	08:03 (WEA06)	20:06	21:00	21:47
6	08:40		09:23 (WEA05)	08:03		09:32 (WEA05)	07:03		07:28 (WEA06)	06:48	05:41	04:58
	16:20	134	15:20 (WEA02)	17:15	47	10:19 (WEA05)	18:10	36	08:04 (WEA06)	20:07	21:02	21:48
7	08:40		09:23 (WEA05)	08:01		09:33 (WEA05)	07:00		07:27 (WEA06)	06:45	05:39	04:57
	16:21	133	15:20 (WEA02)	17:17	45	10:18 (WEA05)	18:12	38	08:05 (WEA06)	20:09	21:04	21:49
8	08:39		09:24 (WEA05)	07:59		09:34 (WEA05)	06:58		07:26 (WEA06)	06:43	05:37	04:57
	16:23	130	15:20 (WEA02)	17:19	43	10:17 (WEA05)	18:14	39	08:05 (WEA06)	20:11	21:06	21:50
9	08:39		09:24 (WEA05)	07:57		09:35 (WEA05)	06:56		07:25 (WEA06)	06:41	05:35	04:56
	16:24	128	15:20 (WEA02)	17:21	41	10:16 (WEA05)	18:16	41	08:06 (WEA06)	20:13	21:07	21:51
10	08:38		09:24 (WEA05)	07:55		09:37 (WEA05)	06:53		07:24 (WEA06)	06:38	05:34	04:56
	16:26	125	15:20 (WEA02)	17:23	38	10:15 (WEA05)	18:17	42	08:06 (WEA06)	20:15	21:09	21:52
11	08:37		09:24 (WEA05)	07:53		09:37 (WEA05)	06:51		07:24 (WEA06)	06:36	05:32	04:55
	16:27	122	15:19 (WEA02)	17:25	35	10:12 (WEA05)	18:19	42	08:06 (WEA06)	20:17	21:11	21:53
12	08:37		09:24 (WEA05)	07:51		09:39 (WEA05)	06:49		07:23 (WEA06)	06:33	05:30	04:55
	16:29	118	15:18 (WEA02)	17:27	31	10:10 (WEA05)	18:21	43	08:06 (WEA06)	20:18	21:13	21:54
13	08:36		09:24 (WEA05)	07:49		09:42 (WEA05)	06:46		07:23 (WEA06)	06:31	05:28	04:54
	16:30	112	15:17 (WEA02)	17:29	26	10:08 (WEA05)	18:23	43	08:06 (WEA06)	20:20	21:14	21:54
14	08:35		09:24 (WEA05)	07:47		09:45 (WEA05)	06:44		07:22 (WEA06)	06:29	05:26	04:54
	16:32	102	15:16 (WEA02)	17:31	20	10:05 (WEA05)	18:25	43	08:05 (WEA06)	20:22	21:16	21:55
15	08:34		09:24 (WEA05)	07:45		09:49 (WEA05)	06:41		07:23 (WEA06)	06:26	05:25	04:54
	16:34	84	15:06 (WEA03)	17:33	11	10:00 (WEA05)	18:27	42	08:05 (WEA06)	20:24	21:18	21:56
16	08:33		09:24 (WEA05)	07:43			06:39		07:23 (WEA06)	06:24	05:23	04:54
	16:35	83	15:05 (WEA03)	17:35			18:29	42	08:05 (WEA06)	20:26	21:19	21:56
17	08:32		09:25 (WEA05)	07:41			06:36		07:23 (WEA06)	06:22	05:21	04:54
	16:37	81	15:05 (WEA03)	17:37			18:31	40	08:03 (WEA06)	20:28	21:21	21:57
18	08:31		09:24 (WEA05)	07:39			06:34		07:23 (WEA06)	06:20	05:20	04:54
	16:39	81	15:04 (WEA03)	17:39			18:32	40	08:03 (WEA06)	20:29	21:23	21:57
19	08:30		09:24 (WEA05)	07:37			06:32		07:23 (WEA06)	06:17	05:18	04:54
	16:40	78	15:03 (WEA03)	17:41			18:34	38	08:01 (WEA06)	20:31	21:24	21:57
20	08:29		09:25 (WEA05)	07:35			06:29		07:24 (WEA06)	06:15	05:17	04:54
	16:42	76	15:03 (WEA03)	17:43			18:36	36	08:00 (WEA06)	20:33	21:26	21:58
21	08:28		09:25 (WEA05)	07:32			06:27		07:25 (WEA06)	06:13	05:15	04:54
	16:44	72	15:01 (WEA03)	17:45			18:38	34	07:59 (WEA06)	20:35	21:27	21:58
22	08:26		09:25 (WEA05)	07:30			06:24		07:26 (WEA06)	06:10	05:14	04:54
	16:46	68	14:59 (WEA03)	17:47			18:40	31	07:57 (WEA06)	20:37	21:29	21:58
23	08:25		09:25 (WEA05)	07:28			06:22		07:27 (WEA06)	06:08	05:13	04:54
	16:48	59	14:54 (WEA03)	17:49			18:42	28	07:55 (WEA06)	20:39	21:30	21:58
24	08:24		09:26 (WEA05)	07:26			06:19		07:29 (WEA06)	06:06	05:11	04:55
	16:49	55	10:21 (WEA05)	17:50			18:44	24	07:53 (WEA06)	20:40	21:32	21:58
25	08:22		09:25 (WEA05)	07:24			06:17		07:30 (WEA06)	06:04	05:10	04:55
	16:51	56	10:21 (WEA05)	17:52			18:45	19	07:49 (WEA06)	20:42	21:33	21:58
26	08:21		09:26 (WEA05)	07:21			06:14		07:35 (WEA06)	06:02	05:09	04:55
	16:53	55	10:21 (WEA05)	17:54			18:47	10	07:45 (WEA06)	20:44	21:35	21:58
27	08:19		09:26 (WEA05)	07:19			06:12			05:59	05:07	04:56
	16:55	55	10:21 (WEA05)	17:56			18:49			20:46	21:36	21:58
28	08:18		09:26 (WEA05)	07:17		07:41 (WEA06)	06:10			05:57	05:06	04:56
	16:57	55	10:21 (WEA05)	17:58	12	07:53 (WEA06)	18:51			20:48	21:38	21:58
29	08:16		09:27 (WEA05)				07:07			05:55	05:05	04:57
	16:59	55	10:22 (WEA05)				19:53			20:50	21:39	21:58
30	08:15		09:28 (WEA05)				07:05			05:53	05:04	04:57
	17:01	53	10:21 (WEA05)				19:55			20:51	21:40	21:58
31	08:13		09:28 (WEA05)				07:02				05:03	
	17:03	53	10:21 (WEA05)				19:56				21:41	
Sonnenscheinstunden	251			274			367		420	493	509	
astr.max.mögl.Beschattung		2903			602			884				
Red.Sonnenscheinwahrsch.		0,17			0,24			0,28				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,63			0,60			0,62				
Gesamte Reduktion		0,10			0,14			0,16				
Met.wahrsch.Beschattung		296			82			143				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September			Oktober			November			Dezember		
1	04:58		05:38		06:31			07:24		08:03 (WEA06)	07:22		09:05 (WEA05)	08:17		09:06 (WEA05)
	21:57		21:23		20:16			19:03	42	08:45 (WEA06)	16:53	38	09:43 (WEA05)	16:09	123	15:01 (WEA02)
2	04:59		05:39		06:33			07:26		08:02 (WEA06)	07:24		09:04 (WEA05)	08:18		09:07 (WEA05)
	21:57		21:21		20:14			19:01	42	08:44 (WEA06)	16:51	41	09:45 (WEA05)	16:08	125	15:03 (WEA02)
3	05:00		05:41		06:35			07:28		08:02 (WEA06)	07:26		09:04 (WEA05)	08:20		09:07 (WEA05)
	21:57		21:19		20:12			18:58	42	08:44 (WEA06)	16:49	43	09:47 (WEA05)	16:08	128	15:03 (WEA02)
4	05:00		05:43		06:37			07:30		08:02 (WEA06)	07:28		09:03 (WEA05)	08:21		09:08 (WEA05)
	21:56		21:17		20:09			18:56	41	08:43 (WEA06)	16:47	45	09:48 (WEA05)	16:07	130	15:04 (WEA02)
5	05:01		05:44		06:38			07:31		08:02 (WEA06)	07:30		09:02 (WEA05)	08:23		09:08 (WEA05)
	21:56		21:15		20:07			18:53	41	08:43 (WEA06)	16:45	47	09:49 (WEA05)	16:06	133	15:05 (WEA02)
6	05:02		05:46		06:40			07:33		08:03 (WEA06)	07:32		09:01 (WEA05)	08:24		09:09 (WEA05)
	21:55		21:13		20:04			18:51	39	08:42 (WEA06)	16:43	48	09:49 (WEA05)	16:06	134	15:06 (WEA02)
7	05:03		05:48		06:42			07:35		08:04 (WEA06)	07:34		09:00 (WEA05)	08:25		09:10 (WEA05)
	21:54		21:11		20:02			18:49	37	08:41 (WEA06)	16:42	50	09:50 (WEA05)	16:05	134	15:06 (WEA02)
8	05:04		05:49		06:44			07:37		08:03 (WEA06)	07:36		09:00 (WEA05)	08:27		09:11 (WEA05)
	21:54		21:09		20:00			18:46	36	08:39 (WEA06)	16:40	51	09:51 (WEA05)	16:05	136	15:08 (WEA02)
9	05:05		05:51		06:45			07:39		08:05 (WEA06)	07:38		08:59 (WEA05)	08:28		09:12 (WEA05)
	21:53		21:07		19:57			18:44	33	08:38 (WEA06)	16:38	52	09:51 (WEA05)	16:05	135	15:08 (WEA02)
10	05:06		05:53		06:47			07:41		08:07 (WEA06)	07:39		08:59 (WEA05)	08:29		09:12 (WEA05)
	21:52		21:05		19:55			18:42	29	08:36 (WEA06)	16:36	52	09:51 (WEA05)	16:04	138	15:09 (WEA02)
11	05:07		05:55		06:49			07:42		08:09 (WEA06)	07:41		08:59 (WEA05)	08:30		09:13 (WEA05)
	21:51		21:03		19:52			18:39	25	08:34 (WEA06)	16:35	53	09:52 (WEA05)	16:04	138	15:09 (WEA02)
12	05:09		05:56		06:51			07:44		08:11 (WEA06)	07:43		08:58 (WEA05)	08:31		09:14 (WEA05)
	21:50		21:01		19:50			18:37	21	08:32 (WEA06)	16:33	54	09:52 (WEA05)	16:04	138	15:10 (WEA02)
13	05:10		05:58		06:52			07:46		08:13 (WEA06)	07:45		08:59 (WEA05)	08:32		09:15 (WEA05)
	21:49		20:59		19:47			18:34	16	08:29 (WEA06)	16:31	55	09:54 (WEA05)	16:04	139	15:11 (WEA02)
14	05:11		06:00		06:54			07:48		08:16 (WEA06)	07:47		08:59 (WEA05)	08:33		09:15 (WEA05)
	21:48		20:57		19:45			18:32	8	08:24 (WEA06)	16:30	55	09:54 (WEA05)	16:04	139	15:11 (WEA02)
15	05:12		06:02		06:56			07:50			07:49		08:59 (WEA05)	08:34		09:16 (WEA05)
	21:47		20:55		19:42			18:30			16:28	55	09:54 (WEA05)	16:04	139	15:12 (WEA02)
16	05:14		06:03		06:58			07:52			07:51		08:59 (WEA05)	08:35		09:17 (WEA05)
	21:46		20:53		19:40			18:28			16:27	55	09:54 (WEA05)	16:04	139	15:13 (WEA02)
17	05:15		06:05		06:59		08:25 (WEA06)	07:54			07:53		08:59 (WEA05)	08:36		09:17 (WEA05)
	21:45		20:51		19:38	7	08:32 (WEA06)	18:25			16:25	55	09:54 (WEA05)	16:04	139	15:12 (WEA02)
18	05:16		06:07		07:01		08:20 (WEA06)	07:55			07:54		09:00 (WEA05)	08:37		09:18 (WEA05)
	21:44		20:49		19:35	17	08:37 (WEA06)	18:23			16:24	55	09:55 (WEA05)	16:04	139	15:13 (WEA02)
19	05:18		06:09		07:03		08:16 (WEA06)	07:57			07:56		09:00 (WEA05)	08:37		09:18 (WEA05)
	21:43		20:46		19:33	23	08:39 (WEA06)	18:21			16:22	59	14:29 (WEA03)	16:05	140	15:14 (WEA02)
20	05:19		06:10		07:05		08:14 (WEA06)	07:59			07:58		09:00 (WEA05)	08:38		09:18 (WEA05)
	21:41		20:44		19:30	27	08:41 (WEA06)	18:18			16:21	68	14:34 (WEA03)	16:05	139	15:14 (WEA02)
21	05:20		06:12		07:07		08:12 (WEA06)	08:01			08:00		09:01 (WEA05)	08:39		09:19 (WEA05)
	21:40		20:42		19:28	30	08:42 (WEA06)	18:16			16:20	72	14:37 (WEA03)	16:05	139	15:15 (WEA02)
22	05:22		06:14		07:08		08:10 (WEA06)	08:03			08:02		09:01 (WEA05)	08:39		09:19 (WEA05)
	21:39		20:40		19:25	34	08:44 (WEA06)	18:14			16:18	76	14:39 (WEA03)	16:06	139	15:15 (WEA02)
23	05:23		06:16		07:10		08:08 (WEA06)	08:05			08:03		09:02 (WEA05)	08:40		09:20 (WEA05)
	21:37		20:37		19:23	36	08:44 (WEA06)	18:12			16:17	78	14:40 (WEA03)	16:06	140	15:16 (WEA02)
24	05:25		06:17		07:12		08:07 (WEA06)	08:07			08:05		09:02 (WEA05)	08:40		09:20 (WEA05)
	21:36		20:35		19:20	38	08:45 (WEA06)	18:10			16:16	81	14:42 (WEA03)	16:07	140	15:16 (WEA02)
25	05:26		06:19		07:14		08:06 (WEA06)	07:09			08:07		09:02 (WEA05)	08:41		09:20 (WEA05)
	21:34		20:33		19:18	39	08:45 (WEA06)	17:07			16:15	81	14:42 (WEA03)	16:08	140	15:16 (WEA02)
26	05:28		06:21		07:15		08:06 (WEA06)	07:11			08:09		09:02 (WEA05)	08:41		09:22 (WEA05)
	21:33		20:31		19:15	40	08:46 (WEA06)	17:05			16:14	83	14:43 (WEA03)	16:08	139	15:17 (WEA02)
27	05:30		06:23		07:17		08:04 (WEA06)	07:12		09:17 (WEA05)	08:10		09:03 (WEA05)	08:41		09:22 (WEA05)
	21:31		20:28		19:13	41	08:45 (WEA06)	17:03	14	09:31 (WEA05)	08:12	84	14:45 (WEA03)	16:09	139	15:18 (WEA02)
28	05:31		06:24		07:19		08:04 (WEA06)	07:14		09:13 (WEA05)	08:12		09:04 (WEA05)	08:41		09:22 (WEA05)
	21:29		20:26		19:10	41	08:45 (WEA06)	17:01	22	09:35 (WEA05)	16:12	103	14:56 (WEA02)	16:10	139	15:18 (WEA02)
29	05:33		06:26		07:21		08:03 (WEA06)	07:16		09:11 (WEA05)	08:14		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:28		20:24		19:08	43	08:46 (WEA06)	16:59	27	09:38 (WEA05)	16:11	112	14:58 (WEA02)	16:11	139	15:18 (WEA02)
30	05:34		06:28		07:22		08:03 (WEA06)	07:18		09:08 (WEA05)	08:15		09:05 (WEA05)	08:41		09:23 (WEA05)
	21:26		20:21		19:06	43	08:46 (WEA06)	16:57	32	09:40 (WEA05)	16:10	118	14:59 (WEA02)	16:12	139	15:19 (WEA02)
31	05:36		06:30					07:20		09:07 (WEA05)				08:41		09:23 (WEA05)
	21:24		20:19					16:55	35	09:42 (WEA05)				16:13	138	15:19 (WEA02)
Sonnenscheinstunden	511		459		382			329			260			234		
astr.max.mögl.Beschattung						459			582			1919			4236	
Red.Sonnenscheinwahrsch.						0,35			0,29			0,19			0,14	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,62			0,61			0,61			0,64	
Gesamte Reduktion						0,20			0,17			0,11			0,09	
Met.wahrsch.Beschattung						94			99			217			362	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42		09:50 (WEA02)	08:12		08:39 (WEA03)	07:15	07:00	05:51	05:02
	16:14	26	10:16 (WEA02)	17:05	29	09:08 (WEA03)	18:00	19:58	20:53	21:43
2	08:41		09:51 (WEA02)	08:10		08:39 (WEA03)	07:12	06:58	05:49	05:01
	16:15	25	10:16 (WEA02)	17:07	30	09:09 (WEA03)	18:02	20:00	20:55	21:44
3	08:41		09:52 (WEA02)	08:08		08:40 (WEA03)	07:10	06:55	05:47	05:00
	16:16	25	10:17 (WEA02)	17:09	30	09:10 (WEA03)	18:04	20:02	20:57	21:45
4	08:41		09:52 (WEA02)	08:06		08:40 (WEA03)	07:08	06:53	05:45	04:59
	16:18	25	10:17 (WEA02)	17:11	30	09:10 (WEA03)	18:06	20:04	20:59	21:46
5	08:41		09:53 (WEA02)	08:05		08:40 (WEA03)	07:05	06:50	05:43	04:59
	16:19	24	10:17 (WEA02)	17:13	30	09:10 (WEA03)	18:08	20:06	21:00	21:47
6	08:40		09:54 (WEA02)	08:03		08:40 (WEA03)	07:03	06:48	05:41	04:58
	16:20	23	10:17 (WEA02)	17:15	30	09:10 (WEA03)	18:10	20:08	21:02	21:48
7	08:40		09:54 (WEA02)	08:01		08:40 (WEA03)	07:01	06:45	05:39	04:57
	16:21	22	10:16 (WEA02)	17:17	30	09:10 (WEA03)	18:12	20:09	21:04	21:49
8	08:39		09:56 (WEA02)	07:59		08:41 (WEA03)	06:58	06:43	05:37	04:57
	16:23	21	10:17 (WEA02)	17:19	28	09:09 (WEA03)	18:14	20:11	21:06	21:50
9	08:39		09:57 (WEA02)	07:57		08:41 (WEA03)	06:56	06:41	05:35	04:56
	16:24	19	10:16 (WEA02)	17:21	28	09:09 (WEA03)	18:16	20:13	21:07	21:51
10	08:38		09:58 (WEA02)	07:55		08:42 (WEA03)	06:53	06:38	05:34	04:56
	16:26	17	10:15 (WEA02)	17:23	26	09:08 (WEA03)	18:18	20:15	21:09	21:52
11	08:37		10:00 (WEA02)	07:53		08:43 (WEA03)	06:51	06:36	05:32	04:55
	16:27	15	10:15 (WEA02)	17:25	25	09:08 (WEA03)	18:19	20:17	21:11	21:53
12	08:37		10:01 (WEA02)	07:51		08:44 (WEA03)	06:49	06:34	05:30	04:55
	16:29	12	10:13 (WEA02)	17:27	22	09:06 (WEA03)	18:21	20:19	21:13	21:54
13	08:36		10:04 (WEA02)	07:49		08:45 (WEA03)	06:46	06:31	05:28	04:55
	16:30	8	10:12 (WEA02)	17:29	19	09:04 (WEA03)	18:23	20:20	21:14	21:54
14	08:35			07:47		08:47 (WEA03)	06:44	06:29	05:27	04:54
	16:32			17:31	15	09:02 (WEA03)	18:25	20:22	21:16	21:55
15	08:34			07:45		08:51 (WEA03)	06:41	06:27	05:25	04:54
	16:34			17:33	8	08:59 (WEA03)	18:27	20:24	21:18	21:56
16	08:33			07:43			06:39	06:24	05:23	04:54
	16:35			17:35			18:29	20:26	21:19	21:56
17	08:32			07:41			06:37	06:22	05:22	04:54
	16:37			17:37			18:31	20:28	21:21	21:57
18	08:31			07:39			06:34	06:20	05:20	04:54
	16:39			17:39			18:33	20:30	21:23	21:57
19	08:30			07:37			06:32	06:17	05:18	04:54
	16:40			17:41			18:34	20:31	21:24	21:57
20	08:29			07:35			06:29	06:15	05:17	04:54
	16:42			17:43			18:36	20:33	21:26	21:58
21	08:28			07:33			06:27	06:13	05:15	04:54
	16:44			17:45			18:38	20:35	21:27	21:58
22	08:26			07:30			06:24	06:11	05:14	04:54
	16:46			17:47			18:40	20:37	21:29	21:58
23	08:25		08:54 (WEA03)	07:28			06:22	06:08	05:13	04:54
	16:48	4	08:58 (WEA03)	17:49			18:42	20:39	21:30	21:58
24	08:24		08:53 (WEA03)	07:26			06:19	06:06	05:11	04:55
	16:50	7	09:00 (WEA03)	17:51			18:44	20:41	21:32	21:59
25	08:22		08:51 (WEA03)	07:24			06:17	06:04	05:10	04:55
	16:51	11	09:02 (WEA03)	17:53			18:45	20:42	21:33	21:59
26	08:21		08:50 (WEA03)	07:21			06:15	06:02	05:09	04:55
	16:53	14	09:04 (WEA03)	17:54			18:47	20:44	21:35	21:59
27	08:20		08:48 (WEA03)	07:19			06:12	06:00	05:07	04:56
	16:55	17	09:05 (WEA03)	17:56			18:49	20:46	21:36	21:58
28	08:18		08:46 (WEA03)	07:17			06:10	05:57	05:06	04:56
	16:57	19	09:05 (WEA03)	17:58			18:51	20:48	21:38	21:58
29	08:16		08:45 (WEA03)				07:07	05:55	05:05	04:57
	16:59	22	09:07 (WEA03)				19:53	20:50	21:39	21:58
30	08:15		08:43 (WEA03)				07:05	05:53	05:04	04:58
	17:01	24	09:07 (WEA03)				19:55	20:51	21:40	21:58
31	08:13		08:41 (WEA03)				07:02		05:03	
	17:03	27	09:08 (WEA03)				19:56		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		407			380					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,61			0,61					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		40			52					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober			November			Dezember		
1	04:58		05:38		06:32		07:24			07:22			08:11 (WEA03)	08:17		09:42 (WEA02)
	21:58		21:23		20:17		19:03			16:53	26		08:37 (WEA03)	16:09	15	09:57 (WEA02)
2	04:59		05:39		06:33		07:26			07:24			08:11 (WEA03)	08:18		09:41 (WEA02)
	21:57		21:21		20:14		19:01			16:51	28		08:39 (WEA03)	16:08	17	09:58 (WEA02)
3	05:00		05:41		06:35		07:28			07:26			08:10 (WEA03)	08:20		09:40 (WEA02)
	21:57		21:19		20:12		18:58			16:49	29		08:39 (WEA03)	16:08	19	09:59 (WEA02)
4	05:01		05:43		06:37		07:30			07:28			08:10 (WEA03)	08:21		09:40 (WEA02)
	21:56		21:17		20:09		18:56			16:47	29		08:39 (WEA03)	16:07	21	10:01 (WEA02)
5	05:01		05:44		06:39		07:32			07:30			08:10 (WEA03)	08:23		09:40 (WEA02)
	21:56		21:15		20:07		18:54			16:45	30		08:40 (WEA03)	16:06	22	10:02 (WEA02)
6	05:02		05:46		06:40		07:33			07:32			08:10 (WEA03)	08:24		09:40 (WEA02)
	21:55		21:13		20:05		18:51			16:44	30		08:40 (WEA03)	16:06	23	10:03 (WEA02)
7	05:03		05:48		06:42		07:35			07:34			08:10 (WEA03)	08:25		09:39 (WEA02)
	21:54		21:11		20:02		18:49			16:42	30		08:40 (WEA03)	16:05	24	10:03 (WEA02)
8	05:04		05:50		06:44		07:37			07:36			08:10 (WEA03)	08:27		09:40 (WEA02)
	21:54		21:10		20:00		18:46			16:40	30		08:40 (WEA03)	16:05	25	10:05 (WEA02)
9	05:05		05:51		06:46		07:39			07:38			08:10 (WEA03)	08:28		09:40 (WEA02)
	21:53		21:08		19:57		18:44			16:38	29		08:39 (WEA03)	16:05	25	10:05 (WEA02)
10	05:06		05:53		06:47		07:41			07:40			08:10 (WEA03)	08:29		09:40 (WEA02)
	21:52		21:06		19:55		18:42			16:36	29		08:39 (WEA03)	16:04	26	10:06 (WEA02)
11	05:08		05:55		06:49		07:43			07:41			08:12 (WEA03)	08:30		09:41 (WEA02)
	21:51		21:04		19:52		18:39			16:35	27		08:39 (WEA03)	16:04	26	10:07 (WEA02)
12	05:09		05:56		06:51		07:44			07:43			08:15 (WEA03)	08:31		09:41 (WEA02)
	21:50		21:01		19:50		18:37			16:33	24		08:39 (WEA03)	16:04	27	10:08 (WEA02)
13	05:10		05:58		06:53		07:46			07:45			08:17 (WEA03)	08:32		09:41 (WEA02)
	21:49		20:59		19:47		18:35			16:31	22		08:39 (WEA03)	16:04	27	10:08 (WEA02)
14	05:11		06:00		06:54		07:48			07:47			08:19 (WEA03)	08:33		09:41 (WEA02)
	21:48		20:57		19:45		18:32			16:30	19		08:38 (WEA03)	16:04	28	10:09 (WEA02)
15	05:12		06:02		06:56		07:50			07:49			08:21 (WEA03)	08:34		09:42 (WEA02)
	21:47		20:55		19:43		18:30			16:28	16		08:37 (WEA03)	16:04	27	10:09 (WEA02)
16	05:14		06:03		06:58		07:52			07:51			08:23 (WEA03)	08:35		09:42 (WEA02)
	21:46		20:53		19:40		18:28			16:27	14		08:37 (WEA03)	16:04	28	10:10 (WEA02)
17	05:15		06:05		07:00		07:54			07:53			08:25 (WEA03)	08:36		09:42 (WEA02)
	21:45		20:51		19:38		18:25			16:25	11		08:36 (WEA03)	16:04	28	10:10 (WEA02)
18	05:16		06:07		07:01		07:56			07:55			08:27 (WEA03)	08:37		09:42 (WEA02)
	21:44		20:49		19:35		18:23			16:24	7		08:34 (WEA03)	16:04	29	10:11 (WEA02)
19	05:18		06:09		07:03		07:57			07:56			08:29 (WEA03)	08:38		09:43 (WEA02)
	21:43		20:46		19:33		18:21			16:22	4		08:33 (WEA03)	16:05	28	10:11 (WEA02)
20	05:19		06:10		07:05		07:59			07:58				08:38		09:44 (WEA02)
	21:41		20:44		19:30		18:19			16:21				16:05	28	10:12 (WEA02)
21	05:21		06:12		07:07		08:01			08:00				08:39		09:44 (WEA02)
	21:40		20:42		19:28		18:16			16:20				16:05	28	10:12 (WEA02)
22	05:22		06:14		07:08		08:03			08:02				08:39		09:45 (WEA02)
	21:39		20:40		19:25		18:14			16:18				16:06	28	10:13 (WEA02)
23	05:23		06:16		07:10		08:05			08:04				08:40		09:45 (WEA02)
	21:37		20:38		19:23		18:12			16:17				16:06	28	10:13 (WEA02)
24	05:25		06:17		07:12		08:07			08:05				08:40		09:45 (WEA02)
	21:36		20:35		19:20		18:10			16:16				16:07	28	10:13 (WEA02)
25	05:27		06:19		07:14		07:09			08:07				08:41		09:46 (WEA02)
	21:34		20:33		19:18		17:08			16:15				16:08	28	10:14 (WEA02)
26	05:28		06:21		07:15		07:11			08:09				08:41		09:46 (WEA02)
	21:33		20:31		19:15		17:05			16:14				16:08	29	10:15 (WEA02)
27	05:30		06:23		07:17		07:13		08:19 (WEA03)	08:10				08:41		09:47 (WEA02)
	21:31		20:28		19:13		17:03	11	08:30 (WEA03)	16:13				16:09	28	10:15 (WEA02)
28	05:31		06:25		07:19		07:14		08:16 (WEA03)	08:12				08:41		09:47 (WEA02)
	21:29		20:26		19:11		17:01	16	08:32 (WEA03)	16:12				16:10	28	10:15 (WEA02)
29	05:33		06:26		07:21		07:16		08:14 (WEA03)	08:14			09:45 (WEA02)	08:42		09:48 (WEA02)
	21:28		20:24		19:08		16:59	20	08:34 (WEA03)	16:11	7		09:52 (WEA02)	16:11	28	10:16 (WEA02)
30	05:34		06:28		07:23		07:18		08:13 (WEA03)	08:15			09:44 (WEA02)	08:42		09:49 (WEA02)
	21:26		20:21		19:06		16:57	22	08:35 (WEA03)	16:10	11		09:55 (WEA02)	16:12	27	10:16 (WEA02)
31	05:36		06:30				07:20		08:12 (WEA03)					08:42		09:49 (WEA02)
	21:24		20:19				16:55	24	08:36 (WEA03)					16:13	27	10:16 (WEA02)
Sonnenscheinstunden	511		459		382		329			260				234		
astr.max.mögl.Beschattung								93			452				800	
Red.Sonnenscheinwahrsch.								0,29			0,19				0,14	
Reduktion Betriebsdauer								0,95			0,95				0,95	
Reduktion Windrichtung								0,61			0,61				0,61	
Gesamte Reduktion								0,17			0,11				0,08	
Met.wahrsch.Beschattung								16			51				65	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP10 - Falkenhorst 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:42	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:54	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:51	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:36
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:42	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:38
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:39	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:48	17:48	18:41	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP11 - Auf dem Kampen 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar			März			April			Mai			Juni		
1	08:41	08:11			07:14			17:25 (WEA05)	07:00		18:49 (WEA06)	05:51		18:51 (WEA06)	05:02	
	16:14	17:05			18:00	8		17:33 (WEA05)	19:58	40	19:29 (WEA06)	20:53	26	19:17 (WEA06)	21:43	
2	08:41	08:10			07:12			17:22 (WEA05)	06:57		18:48 (WEA06)	05:49		18:53 (WEA06)	05:01	
	16:15	17:07			18:02	12		17:34 (WEA05)	20:00	42	19:30 (WEA06)	20:55	21	19:14 (WEA06)	21:44	
3	08:41	08:08			07:10			17:20 (WEA05)	06:55		18:46 (WEA06)	05:47		18:56 (WEA06)	05:00	
	16:16	17:09			18:04	17		17:37 (WEA05)	20:02	45	19:31 (WEA06)	20:57	14	19:10 (WEA06)	21:45	
4	08:41	08:06		16:38 (WEA09)	07:07			17:19 (WEA05)	06:52		18:45 (WEA06)	05:45			04:59	
	16:17	17:11	1	16:39 (WEA09)	18:06	20		17:39 (WEA05)	20:04	47	19:32 (WEA06)	20:58			21:46	
5	08:40	08:04		16:38 (WEA09)	07:05			17:17 (WEA05)	06:50		18:44 (WEA06)	05:43			04:59	
	16:19	17:13	4	16:42 (WEA09)	18:08	24		17:41 (WEA05)	20:05	49	19:33 (WEA06)	21:00			21:47	
6	08:40	08:03		16:37 (WEA09)	07:03			17:17 (WEA05)	06:48		18:43 (WEA06)	05:41			04:58	
	16:20	17:15	7	16:44 (WEA09)	18:10	26		17:43 (WEA05)	20:07	50	19:33 (WEA06)	21:02			21:48	
7	08:40	08:01		16:36 (WEA09)	07:00			17:15 (WEA05)	06:45		18:42 (WEA06)	05:39			04:57	
	16:21	17:17	11	16:47 (WEA09)	18:12	29		17:44 (WEA05)	20:09	51	19:33 (WEA06)	21:04			21:49	
8	08:39	07:59		16:35 (WEA09)	06:58			17:15 (WEA05)	06:43		18:42 (WEA06)	05:37			04:57	
	16:23	17:19	14	16:49 (WEA09)	18:14	32		17:47 (WEA05)	20:11	52	19:34 (WEA06)	21:06			21:50	
9	08:38	07:57		16:35 (WEA09)	06:56			17:15 (WEA05)	06:40		18:40 (WEA06)	05:35			04:56	
	16:24	17:21	16	16:51 (WEA09)	18:15	33		17:48 (WEA05)	20:13	53	19:33 (WEA06)	21:07			21:51	
10	08:38	07:55		16:33 (WEA09)	06:53			17:14 (WEA05)	06:38		18:40 (WEA06)	05:33			04:55	
	16:26	17:23	19	16:52 (WEA09)	18:17	34		17:48 (WEA05)	20:15	54	19:34 (WEA06)	21:09			21:52	
11	08:37	07:53		16:33 (WEA09)	06:51			17:14 (WEA05)	06:36		18:39 (WEA06)	05:32			04:55	
	16:27	17:25	22	16:55 (WEA09)	18:19	34		17:48 (WEA05)	20:16	54	19:33 (WEA06)	21:11			21:53	
12	08:36	07:51		16:33 (WEA09)	06:48			17:14 (WEA05)	06:33		18:39 (WEA06)	05:30			04:55	
	16:29	17:27	24	16:57 (WEA09)	18:21	33		17:47 (WEA05)	20:18	54	19:33 (WEA06)	21:12			21:53	
13	08:36	07:49		16:34 (WEA09)	06:46			17:14 (WEA05)	06:31		18:39 (WEA06)	05:28			04:54	
	16:30	17:29	25	16:59 (WEA09)	18:23	33		17:47 (WEA05)	20:20	54	19:33 (WEA06)	21:14			21:54	
14	08:35	07:47		16:34 (WEA09)	06:44			17:14 (WEA05)	06:29		18:39 (WEA06)	05:26			04:54	
	16:32	17:31	25	16:59 (WEA09)	18:25	31		17:45 (WEA05)	20:22	54	19:33 (WEA06)	21:16			21:55	
15	08:34	07:45		16:34 (WEA09)	06:41			17:15 (WEA05)	06:26		18:38 (WEA06)	05:25			04:54	
	16:33	17:33	25	16:59 (WEA09)	18:27	30		17:45 (WEA05)	20:24	54	19:32 (WEA06)	21:18			21:55	
16	08:33	07:43		16:35 (WEA09)	06:39			17:15 (WEA05)	06:24		18:38 (WEA06)	05:23			04:54	
	16:35	17:35	24	16:59 (WEA09)	18:29	28		17:43 (WEA05)	20:26	54	19:32 (WEA06)	21:19			21:56	
17	08:32	07:41		16:35 (WEA09)	06:36			17:16 (WEA05)	06:22		18:38 (WEA06)	05:21			04:54	
	16:37	17:37	22	16:57 (WEA09)	18:30	26		17:42 (WEA05)	20:27	54	19:32 (WEA06)	21:21			21:56	
18	08:31	07:39		16:36 (WEA09)	06:34			17:17 (WEA05)	06:19		18:39 (WEA06)	05:20			04:54	
	16:39	17:39	20	16:56 (WEA09)	18:32	23		17:40 (WEA05)	20:29	53	19:32 (WEA06)	21:22			21:57	
19	08:30	07:37		16:38 (WEA09)	06:31			17:19 (WEA05)	06:17		18:38 (WEA06)	05:18			04:54	
	16:40	17:41	17	16:55 (WEA09)	18:34	19		17:38 (WEA05)	20:31	52	19:30 (WEA06)	21:24			21:57	
20	08:29	07:35		16:40 (WEA09)	06:29			17:22 (WEA05)	06:15		18:39 (WEA06)	05:17			04:54	
	16:42	17:43	14	16:54 (WEA09)	18:36	14		17:36 (WEA05)	20:33	51	19:30 (WEA06)	21:26			21:58	
21	08:27	07:32		16:43 (WEA09)	06:27				06:13		18:39 (WEA06)	05:15			04:54	
	16:44	17:45	6	16:49 (WEA09)	18:38				20:35	50	19:29 (WEA06)	21:27			21:58	
22	08:26	07:30			06:24				06:10		18:40 (WEA06)	05:14			04:54	
	16:46	17:46			18:40				20:37	49	19:29 (WEA06)	21:29			21:58	
23	08:25	07:28			06:22				06:08		18:40 (WEA06)	05:12			04:54	
	16:48	17:48			18:42				20:38	48	19:28 (WEA06)	21:30			21:58	
24	08:24	07:26			06:19				06:06		18:41 (WEA06)	05:11			04:54	
	16:49	17:50			18:43				20:40	46	19:27 (WEA06)	21:32			21:58	
25	08:22	07:23			06:17				06:04		18:42 (WEA06)	05:10			04:55	
	16:51	17:52			18:45				20:42	44	19:26 (WEA06)	21:33			21:58	
26	08:21	07:21			06:14				06:02		18:43 (WEA06)	05:09			04:55	
	16:53	17:54			18:47				20:44	42	19:25 (WEA06)	21:35			21:58	
27	08:19	07:19			06:12			18:05 (WEA06)	05:59		18:43 (WEA06)	05:07			04:56	
	16:55	17:56			18:49	11		18:16 (WEA06)	20:46	40	19:23 (WEA06)	21:36			21:58	
28	08:18	07:17		17:28 (WEA05)	06:09			18:00 (WEA06)	05:57		18:45 (WEA06)	05:06			04:56	
	16:57	17:58	3	17:31 (WEA05)	18:51	21		18:21 (WEA06)	20:48	36	19:21 (WEA06)	21:37			21:58	
29	08:16				07:07			18:57 (WEA06)	05:55		18:46 (WEA06)	05:05			04:57	
	16:59				19:53	28		19:25 (WEA06)	20:49	34	19:20 (WEA06)	21:39			21:58	
30	08:15				07:05			18:54 (WEA06)	05:53		18:48 (WEA06)	05:04			04:57	
	17:01				19:54	32		19:26 (WEA06)	20:51	30	19:18 (WEA06)	21:40			21:58	
31	08:13				07:02			18:52 (WEA06)				05:03				
	17:03				19:56	36		19:28 (WEA06)				21:41				
Sonnenscheinstunden	251	274			367				420			493			509	
astr.max.mögl.Beschattung			299			634				1436			61			
Red.Sonnenscheinwahrsch.			0,24			0,28				0,37			0,43			
Reduktion Betriebsdauer			0,95			0,95				0,95			0,95			
Reduktion Windrichtung			0,68			0,65				0,65			0,65			
Gesamte Reduktion			0,15			0,17				0,23			0,26			
Met.wahrsch.Beschattung			46			108				330			16			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP11 - Auf dem Kampen 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September			Oktober			November			Dezember
1	04:58		05:38			06:31			18:39 (WEA06)	07:24		17:53 (WEA05)	07:22		16:03 (WEA09)	08:17
	21:57		21:22			20:16	54		19:33 (WEA06)	19:03	33	18:26 (WEA05)	16:53	19	16:22 (WEA09)	16:09
2	04:59		05:39			06:33			18:38 (WEA06)	07:26		17:52 (WEA05)	07:24		16:03 (WEA09)	08:18
	21:57		21:21			20:14	54		19:32 (WEA06)	19:01	34	18:26 (WEA05)	16:51	16	16:19 (WEA09)	16:08
3	05:00		05:41			06:35			18:38 (WEA06)	07:28		17:52 (WEA05)	07:26		16:04 (WEA09)	08:20
	21:57		21:19			20:12	53		19:31 (WEA06)	18:58	34	18:26 (WEA05)	16:49	13	16:17 (WEA09)	16:08
4	05:00		05:43			06:37			18:39 (WEA06)	07:30		17:52 (WEA05)	07:28		16:06 (WEA09)	08:21
	21:56		21:17			20:09	52		19:31 (WEA06)	18:56	33	18:25 (WEA05)	16:47	10	16:16 (WEA09)	16:07
5	05:01		05:44			06:38			18:38 (WEA06)	07:31		17:52 (WEA05)	07:30		16:06 (WEA09)	08:22
	21:56		21:15			20:07	51		19:29 (WEA06)	18:53	33	18:25 (WEA05)	16:45	8	16:14 (WEA09)	16:06
6	05:02		05:46			06:40			18:39 (WEA06)	07:33		17:52 (WEA05)	07:32		16:08 (WEA09)	08:24
	21:55		21:13			20:04	50		19:29 (WEA06)	18:51	31	18:23 (WEA05)	16:43	4	16:12 (WEA09)	16:06
7	05:03		05:48			06:42			18:39 (WEA06)	07:35		17:52 (WEA05)	07:34		16:09 (WEA09)	08:25
	21:54		21:11			20:02	49		19:28 (WEA06)	18:49	28	18:20 (WEA05)	16:41	1	16:10 (WEA09)	16:05
8	05:04		05:49			06:44			18:39 (WEA06)	07:37		17:52 (WEA05)	07:35			08:26
	21:54		21:09			20:00	47		19:26 (WEA06)	18:46	25	18:17 (WEA05)	16:40			16:05
9	05:05		05:51		19:11 (WEA06)	06:45			18:40 (WEA06)	07:39		17:53 (WEA05)	07:37			08:28
	21:53		21:07	3	19:14 (WEA06)	19:57	45		19:25 (WEA06)	18:44	22	18:15 (WEA05)	16:38			16:05
10	05:06		05:53		19:04 (WEA06)	06:47			18:41 (WEA06)	07:40		17:54 (WEA05)	07:39			08:29
	21:52		21:05	16	19:20 (WEA06)	19:55	43		19:24 (WEA06)	18:41	18	18:12 (WEA05)	16:36			16:04
11	05:07		05:55		19:01 (WEA06)	06:49			18:42 (WEA06)	07:42		17:55 (WEA05)	07:41			08:30
	21:51		21:03	22	19:23 (WEA06)	19:52	39		19:21 (WEA06)	18:39	15	18:10 (WEA05)	16:34			16:04
12	05:08		05:56		18:57 (WEA06)	06:51			18:43 (WEA06)	07:44		17:57 (WEA05)	07:43			08:31
	21:50		21:01	28	19:25 (WEA06)	19:50	37		19:20 (WEA06)	18:37	11	18:08 (WEA05)	16:33			16:04
13	05:10		05:58		18:56 (WEA06)	06:52			18:45 (WEA06)	07:46		17:59 (WEA05)	07:45			08:32
	21:49		20:59	31	19:27 (WEA06)	19:47	33		19:18 (WEA06)	18:34	6	18:05 (WEA05)	16:31			16:04
14	05:11		06:00		18:54 (WEA06)	06:54			18:47 (WEA06)	07:48			07:47			08:33
	21:48		20:57	35	19:29 (WEA06)	19:45	28		19:15 (WEA06)	18:32			16:30			16:04
15	05:12		06:01		18:52 (WEA06)	06:56			18:49 (WEA06)	07:50			07:49			08:34
	21:47		20:55	37	19:29 (WEA06)	19:42	22		19:11 (WEA06)	18:30			16:28			16:04
16	05:13		06:03		18:51 (WEA06)	06:58			18:53 (WEA06)	07:52			07:51			08:35
	21:46		20:53	39	19:30 (WEA06)	19:40	14		19:07 (WEA06)	18:27			16:26			16:04
17	05:15		06:05		18:50 (WEA06)	06:59				07:53			07:52			08:36
	21:45		20:51	42	19:32 (WEA06)	19:37				18:25			16:25			16:04
18	05:16		06:07		18:48 (WEA06)	07:01				07:55			07:54			08:37
	21:44		20:48	44	19:32 (WEA06)	19:35				18:23			16:24			16:04
19	05:18		06:08		18:47 (WEA06)	07:03				07:57			07:56			08:37
	21:42		20:46	46	19:33 (WEA06)	19:33				18:21			16:22			16:04
20	05:19		06:10		18:46 (WEA06)	07:05				07:59			07:58			08:38
	21:41		20:44	48	19:34 (WEA06)	19:30				18:18			16:21			16:05
21	05:20		06:12		18:44 (WEA06)	07:06				08:01		17:13 (WEA09)	08:00			08:39
	21:40		20:42	49	19:33 (WEA06)	19:28				18:16	9	17:22 (WEA09)	16:19			16:05
22	05:22		06:14		18:44 (WEA06)	07:08				08:03		17:10 (WEA09)	08:02			08:39
	21:38		20:40	50	19:34 (WEA06)	19:25				18:14	15	17:25 (WEA09)	16:18			16:06
23	05:23		06:16		18:43 (WEA06)	07:10			18:07 (WEA05)	08:05		17:08 (WEA09)	08:03			08:40
	21:37		20:37	52	19:35 (WEA06)	19:23	11		18:18 (WEA05)	18:12	18	17:26 (WEA09)	16:17			16:06
24	05:25		06:17		18:42 (WEA06)	07:12			18:03 (WEA05)	08:07		17:06 (WEA09)	08:05			08:40
	21:36		20:35	52	19:34 (WEA06)	19:20	18		18:21 (WEA05)	18:10	21	17:27 (WEA09)	16:16			16:07
25	05:26		06:19		18:41 (WEA06)	07:13			18:01 (WEA05)	07:09		16:05 (WEA09)	08:07			08:40
	21:34		20:33	54	19:35 (WEA06)	19:18	22		18:23 (WEA05)	17:07	23	16:28 (WEA09)	16:15			16:07
26	05:28		06:21		18:41 (WEA06)	07:15			17:58 (WEA05)	07:10		16:04 (WEA09)	08:08			08:41
	21:32		20:30	54	19:35 (WEA06)	19:15	25		18:23 (WEA05)	17:05	24	16:28 (WEA09)	16:14			16:08
27	05:29		06:23		18:40 (WEA06)	07:17			17:57 (WEA05)	07:12		16:04 (WEA09)	08:10			08:41
	21:31		20:28	54	19:34 (WEA06)	19:13	28		18:25 (WEA05)	17:03	25	16:29 (WEA09)	16:13			16:09
28	05:31		06:24		18:40 (WEA06)	07:19			17:56 (WEA05)	07:14		16:03 (WEA09)	08:12			08:41
	21:29		20:26	54	19:34 (WEA06)	19:10	29		18:25 (WEA05)	17:01	26	16:29 (WEA09)	16:12			16:10
29	05:33		06:26		18:40 (WEA06)	07:21			17:55 (WEA05)	07:16		16:03 (WEA09)	08:13			08:41
	21:28		20:23	54	19:34 (WEA06)	19:08	31		18:26 (WEA05)	16:59	25	16:28 (WEA09)	16:11			16:11
30	05:34		06:28		18:39 (WEA06)	07:22			17:54 (WEA05)	07:18		16:03 (WEA09)	08:15			08:41
	21:26		20:21	54	19:33 (WEA06)	19:05	32		18:26 (WEA05)	16:57	23	16:26 (WEA09)	16:10			16:12
31	05:36		06:30		18:39 (WEA06)					07:20		16:03 (WEA09)				08:41
	21:24		20:19	54	19:33 (WEA06)					16:55	21	16:24 (WEA09)				16:13
Sonnenscheinstunden	511		459			382				329			260			234
astr.max.mögl.Beschattung				972			867				553			71		
Red.Sonnenscheinwahrsch.				0,42			0,35				0,29			0,19		
Reduktion Betriebsdauer				0,95			0,95				0,95			0,95		
Reduktion Windrichtung				0,65			0,65				0,66			0,68		
Gesamte Reduktion				0,26			0,21				0,18			0,12		
Met.wahrsch.Beschattung				254			186				101			9		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP12 - Auf dem Kampen 6, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		07:00		05:51		18:58 (WEA06)	05:02		19:21 (WEA06)
	16:14		17:05		18:00		19:58		20:53	61	19:59 (WEA06)	21:43	17	19:38 (WEA06)
2	08:41		08:10		07:12		06:57	17:31 (WEA04)	05:49		18:58 (WEA06)	05:01		19:24 (WEA06)
	16:15		17:07		18:02	3	20:00	17:34 (WEA04)	20:55	61	19:59 (WEA06)	21:44	13	19:37 (WEA06)
3	08:41		08:08		07:10		06:55	17:30 (WEA04)	05:47		18:58 (WEA06)	05:00		19:28 (WEA06)
	16:16		17:09		18:04	7	20:02	17:37 (WEA04)	20:57	60	19:58 (WEA06)	21:45	5	19:33 (WEA06)
4	08:41		08:06		07:07		06:52	17:29 (WEA04)	05:45		18:58 (WEA06)	04:59		
	16:17		17:11		18:06	10	20:04	17:39 (WEA04)	20:58	60	19:58 (WEA06)	21:46		
5	08:40		08:04		07:05		06:50	17:27 (WEA04)	05:43		18:58 (WEA06)	04:59		
	16:19		17:13		18:08	14	20:05	17:41 (WEA04)	21:00	60	19:58 (WEA06)	21:47		
6	08:40		08:03		07:03		06:48	17:27 (WEA04)	05:41		18:58 (WEA06)	04:58		
	16:20		17:15		18:10	16	20:07	17:43 (WEA04)	21:02	59	19:57 (WEA06)	21:48		
7	08:40		08:01	16:46 (WEA09)	07:00		06:45	17:26 (WEA04)	05:39		18:58 (WEA06)	04:57		
	16:21		17:17	1 16:47 (WEA09)	18:12	18	20:09	17:44 (WEA04)	21:04	59	19:57 (WEA06)	21:49		
8	08:39		07:59	16:44 (WEA09)	06:58		06:43	17:26 (WEA04)	05:37		18:59 (WEA06)	04:57		
	16:23		17:19	5 16:49 (WEA09)	18:14	21	20:11	17:47 (WEA04)	21:06	58	19:57 (WEA06)	21:50		
9	08:38		07:57	16:43 (WEA09)	06:56		06:40	17:26 (WEA04)	05:35		18:59 (WEA06)	04:56		
	16:24		17:21	8 16:51 (WEA09)	18:15	23	20:13	17:49 (WEA04)	21:07	58	19:57 (WEA06)	21:51		
10	08:38		07:55	16:41 (WEA09)	06:53		06:38	17:26 (WEA04)	05:33		18:59 (WEA06)	04:55		
	16:26		17:23	11 16:52 (WEA09)	18:17	25	20:15	17:51 (WEA05)	21:09	57	19:56 (WEA06)	21:52		
11	08:37		07:53	16:40 (WEA09)	06:51		06:36	17:27 (WEA04)	05:32		19:00 (WEA06)	04:55		
	16:27		17:25	15 16:55 (WEA09)	18:19	26	20:16	17:53 (WEA05)	21:11	56	19:56 (WEA06)	21:53		
12	08:36		07:51	16:39 (WEA09)	06:48		06:33	17:26 (WEA05)	05:30		19:00 (WEA06)	04:55		
	16:29		17:27	18 16:57 (WEA09)	18:21	28	20:18	17:54 (WEA05)	21:12	55	19:55 (WEA06)	21:53		
13	08:36		07:49	16:39 (WEA09)	06:46		06:31	17:25 (WEA05)	05:28		19:00 (WEA06)	04:54		
	16:30		17:29	20 16:59 (WEA09)	18:23	32	20:20	17:57 (WEA05)	21:14	54	19:54 (WEA06)	21:54		
14	08:35		07:47	16:39 (WEA09)	06:44		06:29	17:24 (WEA05)	05:26		19:01 (WEA06)	04:54		
	16:32		17:31	22 17:01 (WEA09)	18:25	34	20:22	17:58 (WEA05)	21:16	53	19:54 (WEA06)	21:55		
15	08:34		07:45	16:39 (WEA09)	06:41		06:26	17:24 (WEA05)	05:25		19:01 (WEA06)	04:54		
	16:33		17:33	25 17:04 (WEA09)	18:27	35	20:24	17:59 (WEA05)	21:18	52	19:53 (WEA06)	21:55		
16	08:33		07:43	16:39 (WEA09)	06:39		06:24	17:23 (WEA05)	05:23		19:03 (WEA06)	04:54		
	16:35		17:35	27 17:06 (WEA09)	18:29	36	20:26	17:59 (WEA05)	21:19	50	19:53 (WEA06)	21:56		
17	08:32		07:41	16:38 (WEA09)	06:36		06:22	17:23 (WEA05)	05:21		19:03 (WEA06)	04:54		
	16:37		17:37	28 17:06 (WEA09)	18:30	36	20:27	17:59 (WEA05)	21:21	49	19:52 (WEA06)	21:56		
18	08:31		07:39	16:39 (WEA09)	06:34		06:19	17:22 (WEA05)	05:20		19:04 (WEA06)	04:54		
	16:39		17:39	27 17:06 (WEA09)	18:32	36	20:29	17:58 (WEA05)	21:22	48	19:52 (WEA06)	21:57		
19	08:30		07:37	16:39 (WEA09)	06:31		06:17	17:22 (WEA05)	05:18		19:04 (WEA06)	04:54		
	16:40		17:41	27 17:06 (WEA09)	18:34	36	20:31	17:58 (WEA05)	21:24	47	19:51 (WEA06)	21:57		
20	08:29		07:35	16:40 (WEA09)	06:29		06:15	17:23 (WEA05)	05:17		19:05 (WEA06)	04:54		
	16:42		17:43	25 17:05 (WEA09)	18:36	35	20:33	17:58 (WEA05)	21:26	45	19:50 (WEA06)	21:58		
21	08:27		07:32	16:40 (WEA09)	06:27		06:13	17:23 (WEA05)	05:15		19:07 (WEA06)	04:54		
	16:44		17:45	24 17:04 (WEA09)	18:38	34	20:35	17:57 (WEA05)	21:27	43	19:50 (WEA06)	21:58		
22	08:26		07:30	16:41 (WEA09)	06:24		06:10	17:23 (WEA05)	05:14		19:08 (WEA06)	04:54		
	16:46		17:46	22 17:03 (WEA09)	18:40	33	20:37	17:56 (WEA05)	21:29	41	19:49 (WEA06)	21:58		
23	08:25		07:28	16:43 (WEA09)	06:22		06:08	17:23 (WEA05)	05:12		19:08 (WEA06)	04:54		
	16:48		17:48	19 17:02 (WEA09)	18:42	32	20:38	17:55 (WEA05)	21:30	40	19:48 (WEA06)	21:58		
24	08:24		07:26	16:45 (WEA09)	06:19		06:06	17:25 (WEA05)	05:11		19:09 (WEA06)	04:54		
	16:49		17:50	15 17:00 (WEA09)	18:43	29	20:40	17:54 (WEA05)	21:32	38	19:47 (WEA06)	21:58		
25	08:22		07:23	16:47 (WEA09)	06:17		06:04	17:25 (WEA05)	05:10		19:11 (WEA06)	04:55		
	16:51		17:52	9 16:56 (WEA09)	18:45	26	20:42	17:51 (WEA05)	21:33	35	19:46 (WEA06)	21:58		
26	08:21		07:21		06:14		06:02	17:27 (WEA05)	05:09		19:12 (WEA06)	04:55		
	16:53		17:54		18:47	23	20:44	17:50 (WEA05)	21:35	34	19:46 (WEA06)	21:58		
27	08:19		07:19		06:12		05:59	17:28 (WEA05)	05:07		19:13 (WEA06)	04:56		
	16:55		17:56		18:49	19	20:46	17:47 (WEA05)	21:36	32	19:45 (WEA06)	21:58		
28	08:18		07:17		06:09		05:57	17:32 (WEA05)	05:06		19:15 (WEA06)	04:56		
	16:57		17:58		18:51	12	20:48	17:44 (WEA05)	21:37	29	19:44 (WEA06)	21:58		
29	08:16				07:07		05:55		05:05		19:16 (WEA06)	04:57		
	16:59				19:53		20:49	61	21:39	27	19:43 (WEA06)	21:58		
30	08:15				07:05		05:53		05:04		19:18 (WEA06)	04:57		
	17:01				19:54		20:51	61	21:40	23	19:41 (WEA06)	21:58		
31	08:13				07:02				05:03		19:19 (WEA06)			
	17:03				19:56				21:41	21	19:40 (WEA06)			
Sonnenscheinstunden	251		274		367		420		493			509		
astr.max.mögl.Beschattung				348		679		1011		1465			35	
Red.Sonnenscheinwahrsch.				0,24		0,28		0,37		0,43			0,39	
Reduktion Betriebsdauer				0,95		0,95		0,95		0,95			0,95	
Reduktion Windrichtung				0,68		0,65		0,63		0,63			0,63	
Gesamte Reduktion				0,15		0,17		0,22		0,26			0,23	
Met.wahrsch.Beschattung				53		116		225		376			8	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP12 - Auf dem Kampen 6, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

Juli			August			September			Oktober			November			Dezember
1 | 04:58			| 05:38		19:10 (WEA06) | 06:31		19:20 (WEA06)	| 07:24		18:04 (WEA05)	| 07:22		16:11 (WEA09)	| 08:17
| 21:57			| 21:22	56	20:06 (WEA06) | 20:16	23	19:43 (WEA06)	| 19:03	30	18:34 (WEA05)	| 16:53	11	16:22 (WEA09)	| 16:09
2 | 04:59			| 05:39		19:09 (WEA06) | 06:33		19:24 (WEA06)	| 07:26		18:05 (WEA04)	| 07:24		16:12 (WEA09)	| 08:18
| 21:57			| 21:21	57	20:06 (WEA06) | 20:14	13	19:37 (WEA06)	| 19:01	27	18:32 (WEA05)	| 16:51	7	16:19 (WEA09)	| 16:08
3 | 05:00			| 05:41		19:09 (WEA06) | 06:35			| 07:28		18:04 (WEA04)	| 07:26		16:13 (WEA09)	| 08:20
| 21:57			| 21:19	57	20:06 (WEA06) | 20:12			| 18:58	26	18:30 (WEA05)	| 16:49	4	16:17 (WEA09)	| 16:08
4 | 05:00			| 05:43		19:09 (WEA06) | 06:37			| 07:30		18:04 (WEA04)	| 07:28			| 08:21
| 21:56			| 21:17	58	20:07 (WEA06) | 20:09			| 18:56	23	18:27 (WEA04)	| 16:47			| 16:07
5 | 05:01			| 05:44		19:08 (WEA06) | 06:38			| 07:31		18:03 (WEA04)	| 07:30			| 08:22
| 21:56			| 21:15	59	20:07 (WEA06) | 20:07			| 18:53	22	18:25 (WEA04)	| 16:45			| 16:06
6 | 05:02			| 05:46		19:08 (WEA06) | 06:40			| 07:33		18:03 (WEA04)	| 07:32			| 08:24
| 21:55			| 21:13	59	20:07 (WEA06) | 20:04			| 18:51	20	18:23 (WEA04)	| 16:43			| 16:06
7 | 05:03			| 05:48		19:07 (WEA06) | 06:42			| 07:35		18:03 (WEA04)	| 07:34			| 08:25
| 21:54			| 21:11	60	20:07 (WEA06) | 20:02			| 18:49	17	18:20 (WEA04)	| 16:41			| 16:05
8 | 05:04			| 05:49		19:07 (WEA06) | 06:44			| 07:37		18:02 (WEA04)	| 07:35			| 08:26
| 21:54			| 21:09	60	20:07 (WEA06) | 20:00			| 18:46	15	18:17 (WEA04)	| 16:40			| 16:05
9 | 05:05			| 05:51		19:07 (WEA06) | 06:45			| 07:39		18:03 (WEA04)	| 07:37			| 08:28
| 21:53			| 21:07	61	20:08 (WEA06) | 19:57			| 18:44	12	18:15 (WEA04)	| 16:38			| 16:05
10 | 05:06		19:33 (WEA06)	| 05:53		19:06 (WEA06) | 06:47			| 07:40		18:03 (WEA04)	| 07:39			| 08:29
| 21:52	10	19:43 (WEA06)	| 21:05	61	20:07 (WEA06) | 19:55			| 18:41	9	18:12 (WEA04)	| 16:36			| 16:04
11 | 05:07		19:30 (WEA06)	| 05:55		19:06 (WEA06) | 06:49			| 07:42		18:04 (WEA04)	| 07:41			| 08:30
| 21:51	15	19:45 (WEA06)	| 21:03	61	20:07 (WEA06) | 19:52			| 18:39	6	18:10 (WEA04)	| 16:34			| 16:04
12 | 05:08		19:29 (WEA06)	| 05:56		19:06 (WEA06) | 06:51			| 07:44		18:06 (WEA04)	| 07:43			| 08:31
| 21:50	18	19:47 (WEA06)	| 21:01	60	20:06 (WEA06) | 19:50			| 18:37	2	18:08 (WEA04)	| 16:33			| 16:04
13 | 05:10		19:27 (WEA06)	| 05:58		19:06 (WEA06) | 06:52			| 07:46			| 07:45			| 08:32
| 21:49	22	19:49 (WEA06)	| 20:59	60	20:06 (WEA06) | 19:47			| 18:34			| 16:31			| 16:04
14 | 05:11		19:25 (WEA06)	| 06:00		19:06 (WEA06) | 06:54			| 07:48			| 07:47			| 08:33
| 21:48	25	19:50 (WEA06)	| 20:57	61	20:07 (WEA06) | 19:45			| 18:32			| 16:30			| 16:04
15 | 05:12		19:24 (WEA06)	| 06:02		19:05 (WEA06) | 06:56		18:22 (WEA05)	| 07:50			| 07:49			| 08:34
| 21:47	28	19:52 (WEA06)	| 20:55	61	20:06 (WEA06) | 19:42	10	18:32 (WEA05)	| 18:30			| 16:28			| 16:04
16 | 05:13		19:22 (WEA06)	| 06:03		19:06 (WEA06) | 06:58		18:18 (WEA05)	| 07:52			| 07:51			| 08:35
| 21:46	31	19:53 (WEA06)	| 20:53	59	20:05 (WEA06) | 19:40	18	18:36 (WEA05)	| 18:27			| 16:26			| 16:04
17 | 05:15		19:22 (WEA06)	| 06:05		19:06 (WEA06) | 06:59		18:16 (WEA05)	| 07:53		17:18 (WEA09)	| 07:52			| 08:36
| 21:45	33	19:55 (WEA06)	| 20:51	59	20:05 (WEA06) | 19:37	22	18:38 (WEA05)	| 18:25	12	17:30 (WEA09)	| 16:25			| 16:04
18 | 05:16		19:21 (WEA06)	| 06:07		19:06 (WEA06) | 07:01		18:13 (WEA05)	| 07:55		17:15 (WEA09)	| 07:54			| 08:37
| 21:44	35	19:56 (WEA06)	| 20:48	58	20:04 (WEA06) | 19:35	26	18:39 (WEA05)	| 18:23	17	17:32 (WEA09)	| 16:24			| 16:04
19 | 05:18		19:20 (WEA06)	| 06:09		19:06 (WEA06) | 07:03		18:11 (WEA05)	| 07:57		17:14 (WEA09)	| 07:56			| 08:37
| 21:42	36	19:56 (WEA06)	| 20:46	58	20:04 (WEA06) | 19:33	29	18:40 (WEA05)	| 18:21	19	17:33 (WEA09)	| 16:22			| 16:04
20 | 05:19		19:19 (WEA06)	| 06:10		19:07 (WEA06) | 07:05		18:10 (WEA05)	| 07:59		17:12 (WEA09)	| 07:58			| 08:38
| 21:41	39	19:58 (WEA06)	| 20:44	56	20:03 (WEA06) | 19:30	31	18:41 (WEA05)	| 18:18	22	17:34 (WEA09)	| 16:21			| 16:05
21 | 05:20		19:18 (WEA06)	| 06:12		19:06 (WEA06) | 07:06		18:09 (WEA05)	| 08:01		17:11 (WEA09)	| 08:00			| 08:39
| 21:40	41	19:59 (WEA06)	| 20:42	56	20:02 (WEA06) | 19:28	33	18:42 (WEA05)	| 18:16	24	17:35 (WEA09)	| 16:19			| 16:05
22 | 05:22		19:17 (WEA06)	| 06:14		19:07 (WEA06) | 07:08		18:07 (WEA05)	| 08:03		17:10 (WEA09)	| 08:02			| 08:39
| 21:38	42	19:59 (WEA06)	| 20:40	54	20:01 (WEA06) | 19:25	34	18:41 (WEA05)	| 18:14	26	17:36 (WEA09)	| 16:18			| 16:06
23 | 05:23		19:17 (WEA06)	| 06:16		19:08 (WEA06) | 07:10		18:07 (WEA05)	| 08:05		17:09 (WEA09)	| 08:03			| 08:40
| 21:37	44	20:01 (WEA06)	| 20:37	53	20:01 (WEA06) | 19:23	34	18:41 (WEA05)	| 18:12	27	17:36 (WEA09)	| 16:17			| 16:06
24 | 05:25		19:15 (WEA06)	| 06:17		19:08 (WEA06) | 07:12		18:06 (WEA05)	| 08:07		17:09 (WEA09)	| 08:05			| 08:40
| 21:36	46	20:01 (WEA06)	| 20:35	51	19:59 (WEA06) | 19:20	36	18:42 (WEA05)	| 18:10	27	17:36 (WEA09)	| 16:16			| 16:07
25 | 05:26		19:15 (WEA06)	| 06:19		19:09 (WEA06) | 07:13		18:06 (WEA05)	| 07:09		16:09 (WEA09)	| 08:07			| 08:40
| 21:34	47	20:02 (WEA06)	| 20:33	49	19:58 (WEA06) | 19:18	36	18:42 (WEA05)	| 17:07	27	16:36 (WEA09)	| 16:15			| 16:07
26 | 05:28		19:14 (WEA06)	| 06:21		19:10 (WEA06) | 07:15		18:05 (WEA05)	| 07:10		16:08 (WEA09)	| 08:08			| 08:41
| 21:32	49	20:03 (WEA06)	| 20:30	47	19:57 (WEA06) | 19:15	36	18:41 (WEA05)	| 17:05	27	16:35 (WEA09)	| 16:14			| 16:08
27 | 05:29		19:13 (WEA06)	| 06:23		19:10 (WEA06) | 07:17		18:04 (WEA05)	| 07:12		16:08 (WEA09)	| 08:10			| 08:41
| 21:31	50	20:03 (WEA06)	| 20:28	45	19:55 (WEA06) | 19:13	37	18:41 (WEA05)	| 17:03	25	16:33 (WEA09)	| 16:13			| 16:09
28 | 05:31		19:13 (WEA06)	| 06:24		19:12 (WEA06) | 07:19		18:04 (WEA05)	| 07:14		16:08 (WEA09)	| 08:12			| 08:41
| 21:29	51	20:04 (WEA06)	| 20:26	41	19:53 (WEA06) | 19:10	36	18:40 (WEA05)	| 17:01	22	16:30 (WEA09)	| 16:12			| 16:10
29 | 05:33		19:12 (WEA06)	| 06:26		19:14 (WEA06) | 07:21		18:05 (WEA05)	| 07:16		16:09 (WEA09)	| 08:13			| 08:41
| 21:28	52	20:04 (WEA06)	| 20:23	38	19:52 (WEA06) | 19:08	35	18:40 (WEA05)	| 16:59	19	16:28 (WEA09)	| 16:11			| 16:11
30 | 05:34		19:11 (WEA06)	| 06:28		19:15 (WEA06) | 07:22		18:05 (WEA05)	| 07:18		16:09 (WEA09)	| 08:15			| 08:41
| 21:26	54	20:05 (WEA06)	| 20:21	34	19:49 (WEA06) | 19:05	32	18:37 (WEA05)	| 16:57	17	16:26 (WEA09)	| 16:10			| 16:12
31 | 05:36		19:10 (WEA06)	| 06:30		19:17 (WEA06) |			| 07:20		16:10 (WEA09) |			| 08:41
| 21:24	55	20:05 (WEA06)	| 20:19	29	19:46 (WEA06) |			| 16:55	14	16:24 (WEA09) |			| 16:13
Sonnenscheinstunden | 511			| 459		| 382			| 329			| 260			| 234
astr.max.mögl.Beschattung |	823		|	1678	|	521		|	534		|	22		|
Red.Sonnenscheinwahrsch. |	0,38		|	0,42	|	0,35		|	0,29		|	0,19		|
Reduktion Betriebsdauer |	0,95		|	0,95	|	0,95		|	0,95		|	0,95		|
Reduktion Windrichtung |	0,63		|	0,63	|	0,65		|	0,67		|	0,68		|
Gesamte Reduktion |	0,23		|	0,25	|	0,21		|	0,18		|	0,12		|
Met.wahrsch.Beschattung |	186		|	425	|	112		|	99		|	3		|

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP13 - Auf dem Kampen 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar			März			April			Mai			Juni	
1	08:41		08:11			07:14		16:59 (WEA09)	07:00			05:51		19:13 (WEA06)	05:02	
	16:14		17:05			18:00	7	17:06 (WEA09)	19:58			20:53	53	20:06 (WEA06)	21:43	
2	08:41		08:10			07:12			06:57			05:49		19:13 (WEA06)	05:01	
	16:15		17:07			18:02			20:00			20:55	53	20:06 (WEA06)	21:44	
3	08:41		08:08			07:10			06:55			05:47		19:12 (WEA06)	05:00	
	16:16		17:09			18:04			20:02			20:57	54	20:06 (WEA06)	21:45	
4	08:41		08:06			07:07			06:52			05:45		19:12 (WEA06)	04:59	
	16:17		17:11			18:06			20:04			20:58	54	20:06 (WEA06)	21:46	
5	08:40		08:04			07:05			06:50			05:43		19:12 (WEA06)	04:59	
	16:19		17:13			18:08			20:05			21:00	53	20:05 (WEA06)	21:47	
6	08:40		08:03			07:03			06:48			05:41		19:12 (WEA06)	04:58	
	16:20		17:15			18:10			20:07			21:02	53	20:05 (WEA06)	21:48	
7	08:40		08:01			07:00			06:45			05:39		19:12 (WEA06)	04:57	
	16:21		17:17			18:12			20:09			21:04	53	20:05 (WEA06)	21:49	
8	08:39		07:59			06:58			06:43			05:37		19:13 (WEA06)	04:57	
	16:23		17:19			18:14			20:11			21:06	52	20:05 (WEA06)	21:50	
9	08:38		07:57			06:56			06:40			05:35		19:13 (WEA06)	04:56	
	16:24		17:21			18:15			20:13			21:07	51	20:04 (WEA06)	21:51	
10	08:38		07:55			06:53			06:38			05:33		19:13 (WEA06)	04:55	
	16:26		17:23			18:17			20:15			21:09	51	20:04 (WEA06)	21:52	
11	08:37		07:53			06:51		17:48 (WEA05)	06:36			05:32		19:14 (WEA06)	04:55	
	16:27		17:25			18:19	5	17:53 (WEA05)	20:16			21:11	50	20:04 (WEA06)	21:53	
12	08:36		07:51			06:48		17:44 (WEA05)	06:33			05:30		19:14 (WEA06)	04:55	
	16:29		17:27			18:21	10	17:54 (WEA05)	20:18			21:12	49	20:03 (WEA06)	21:53	
13	08:36		07:49		16:56 (WEA09)	06:46		17:42 (WEA05)	06:31		19:40 (WEA06)	05:28		19:14 (WEA06)	04:54	
	16:30		17:29	3	16:59 (WEA09)	18:23	15	17:57 (WEA05)	20:20	6	19:46 (WEA06)	21:14	48	20:02 (WEA06)	21:54	
14	08:35		07:47		16:54 (WEA09)	06:44		17:40 (WEA05)	06:29		19:34 (WEA06)	05:26		19:16 (WEA06)	04:54	
	16:32		17:31	7	17:01 (WEA09)	18:25	18	17:58 (WEA05)	20:22	18	19:52 (WEA06)	21:16	46	20:02 (WEA06)	21:55	
15	08:34		07:45		16:53 (WEA09)	06:41		17:39 (WEA05)	06:26		19:29 (WEA06)	05:25		19:16 (WEA06)	04:54	
	16:33		17:33	11	17:04 (WEA09)	18:27	21	18:00 (WEA05)	20:24	25	19:54 (WEA06)	21:18	45	20:01 (WEA06)	21:55	
16	08:33		07:43		16:52 (WEA09)	06:39		17:37 (WEA05)	06:24		19:27 (WEA06)	05:23		19:17 (WEA06)	04:54	
	16:35		17:35	14	17:06 (WEA09)	18:29	25	18:02 (WEA05)	20:26	30	19:57 (WEA06)	21:19	44	20:01 (WEA06)	21:56	
17	08:32		07:41		16:51 (WEA09)	06:36		17:36 (WEA05)	06:22		19:25 (WEA06)	05:21		19:17 (WEA06)	04:54	
	16:37		17:37	16	17:07 (WEA09)	18:30	28	18:04 (WEA05)	20:27	34	19:59 (WEA06)	21:21	43	20:00 (WEA06)	21:56	
18	08:31		07:39		16:51 (WEA09)	06:34		17:35 (WEA05)	06:19		19:23 (WEA06)	05:20		19:18 (WEA06)	04:54	
	16:39		17:39	19	17:10 (WEA09)	18:32	30	18:05 (WEA05)	20:29	37	20:00 (WEA06)	21:22	42	20:00 (WEA06)	21:57	
19	08:30		07:37		16:50 (WEA09)	06:31		17:35 (WEA05)	06:17		19:21 (WEA06)	05:18		19:19 (WEA06)	04:54	
	16:40		17:41	22	17:12 (WEA09)	18:34	33	18:08 (WEA05)	20:31	40	20:01 (WEA06)	21:24	39	19:58 (WEA06)	21:57	
20	08:29		07:35		16:50 (WEA09)	06:29		17:35 (WEA05)	06:15		19:20 (WEA06)	05:17		19:20 (WEA06)	04:54	
	16:42		17:43	25	17:15 (WEA09)	18:36	33	18:08 (WEA05)	20:33	42	20:02 (WEA06)	21:26	38	19:58 (WEA06)	21:58	
21	08:27		07:32		16:50 (WEA09)	06:27		17:34 (WEA05)	06:13		19:19 (WEA06)	05:15		19:21 (WEA06)	04:54	
	16:44		17:45	26	17:16 (WEA09)	18:38	34	18:08 (WEA05)	20:35	44	20:03 (WEA06)	21:27	36	19:57 (WEA06)	21:58	
22	08:26		07:30		16:50 (WEA09)	06:24		17:34 (WEA05)	06:10		19:18 (WEA06)	05:14		19:22 (WEA06)	04:54	
	16:46		17:46	26	17:16 (WEA09)	18:40	34	18:08 (WEA05)	20:37	46	20:04 (WEA06)	21:29	35	19:57 (WEA06)	21:58	
23	08:25		07:28		16:51 (WEA09)	06:22		17:33 (WEA05)	06:08		19:17 (WEA06)	05:12		19:23 (WEA06)	04:54	
	16:48		17:48	25	17:16 (WEA09)	18:42	34	18:07 (WEA05)	20:38	47	20:04 (WEA06)	21:30	32	19:55 (WEA06)	21:58	
24	08:24		07:26		16:51 (WEA09)	06:19		17:34 (WEA05)	06:06		19:16 (WEA06)	05:11		19:24 (WEA06)	04:54	
	16:49		17:50	25	17:16 (WEA09)	18:43	32	18:06 (WEA05)	20:40	49	20:05 (WEA06)	21:32	30	19:54 (WEA06)	21:58	
25	08:22		07:23		16:51 (WEA09)	06:17		17:34 (WEA05)	06:04		19:15 (WEA06)	05:10		19:26 (WEA06)	04:55	
	16:51		17:52	23	17:14 (WEA09)	18:45	31	18:05 (WEA05)	20:42	51	20:06 (WEA06)	21:33	27	19:53 (WEA06)	21:58	
26	08:21		07:21		16:53 (WEA09)	06:14		17:35 (WEA05)	06:02		19:15 (WEA06)	05:09		19:27 (WEA06)	04:55	
	16:53		17:54	20	17:13 (WEA09)	18:47	29	18:04 (WEA05)	20:44	51	20:06 (WEA06)	21:35	25	19:52 (WEA06)	21:58	
27	08:19		07:19		16:54 (WEA09)	06:12		17:35 (WEA05)	05:59		19:13 (WEA06)	05:07		19:29 (WEA06)	04:56	
	16:55		17:56	18	17:12 (WEA09)	18:49	28	18:03 (WEA05)	20:46	52	20:05 (WEA06)	21:36	22	19:51 (WEA06)	21:58	
28	08:18		07:17		16:56 (WEA09)	06:09		17:36 (WEA05)	05:57		19:13 (WEA06)	05:06		19:31 (WEA06)	04:56	
	16:57		17:58	13	17:09 (WEA09)	18:51	26	18:02 (WEA05)	20:48	52	20:05 (WEA06)	21:37	18	19:49 (WEA06)	21:58	
29	08:16					07:07		18:38 (WEA05)	05:55		19:12 (WEA06)	05:05		19:33 (WEA06)	04:57	
	16:59					19:53	22	19:00 (WEA05)	20:49	53	20:05 (WEA06)	21:39	14	19:47 (WEA06)	21:58	
30	08:15					07:05		18:39 (WEA05)	05:53		19:12 (WEA06)	05:04		19:36 (WEA06)	04:57	
	17:01					19:54	18	18:57 (WEA05)	20:51	53	20:05 (WEA06)	21:40	9	19:45 (WEA06)	21:58	
31	08:13					07:02		18:42 (WEA05)				05:03				
	17:03					19:56	13	18:55 (WEA05)				21:41				
Sonnenscheinstunden	251		274			367			420			493			509	
astr.max.mögl.Beschattung				293			526			730			1219			
Red.Sonnenscheinwahrsch.				0,24			0,28			0,37			0,43			
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95			
Reduktion Windrichtung				0,67			0,65			0,62			0,62			
Gesamte Reduktion				0,15			0,17			0,22			0,25			
Met.wahrsch.Beschattung				45			91			160			308			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP13 - Auf dem Kampen 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober			November	Dezember
1	04:58			05:38		19:24 (WEA06)	06:31			07:24		18:22 (WEA05)	07:22	08:17
	21:57			21:22	50	20:14 (WEA06)	20:16			19:03	12	18:34 (WEA05)	16:53	16:09
2	04:59			05:39		19:23 (WEA06)	06:33			07:26		18:24 (WEA05)	07:24	08:18
	21:57			21:21	50	20:13 (WEA06)	20:14			19:01	8	18:32 (WEA05)	16:51	16:08
3	05:00			05:41		19:23 (WEA06)	06:35			07:28		18:29 (WEA05)	07:26	08:20
	21:57			21:19	51	20:14 (WEA06)	20:12			18:58	1	18:30 (WEA05)	16:49	16:08
4	05:00			05:43		19:23 (WEA06)	06:37			07:30			07:28	08:21
	21:56			21:17	52	20:15 (WEA06)	20:09			18:56			16:47	16:07
5	05:01			05:44		19:22 (WEA06)	06:38			07:31			07:30	08:22
	21:56			21:15	52	20:14 (WEA06)	20:07			18:53			16:45	16:00
6	05:02			05:46		19:22 (WEA06)	06:40			07:33			07:32	08:24
	21:55			21:13	53	20:15 (WEA06)	20:04			18:51			16:43	16:06
7	05:03			05:48		19:21 (WEA06)	06:42			07:35			07:34	08:25
	21:54			21:11	54	20:15 (WEA06)	20:02			18:49			16:41	16:05
8	05:04			05:49		19:22 (WEA06)	06:44			07:37			07:35	08:26
	21:54			21:09	53	20:15 (WEA06)	20:00			18:46			16:40	16:05
9	05:05			05:51		19:22 (WEA06)	06:45			07:39			07:37	08:28
	21:53			21:07	53	20:15 (WEA06)	19:57			18:44			16:38	16:05
10	05:06			05:53		19:21 (WEA06)	06:47			07:40			07:39	08:29
	21:52			21:05	54	20:15 (WEA06)	19:55			18:41			16:36	16:04
11	05:07			05:55		19:21 (WEA06)	06:49			07:42			07:41	08:30
	21:51			21:03	54	20:15 (WEA06)	19:52			18:39			16:34	16:04
12	05:08			05:56		19:20 (WEA06)	06:51		18:34 (WEA05)	07:44			07:43	08:31
	21:50			21:01	54	20:14 (WEA06)	19:50	11	18:45 (WEA05)	18:37			16:33	16:04
13	05:10		19:47 (WEA06)	05:58		19:21 (WEA06)	06:52		18:31 (WEA05)	07:46		17:31 (WEA09)	07:45	08:32
	21:49	4	19:51 (WEA06)	20:59	53	20:14 (WEA06)	19:47	17	18:48 (WEA05)	18:34	10	17:41 (WEA09)	16:31	16:04
14	05:11		19:43 (WEA06)	06:00		19:21 (WEA06)	06:54		18:28 (WEA05)	07:48		17:28 (WEA09)	07:47	08:33
	21:48	12	19:55 (WEA06)	20:57	53	20:14 (WEA06)	19:45	22	18:50 (WEA05)	18:32	15	17:43 (WEA09)	16:30	16:04
15	05:12		19:40 (WEA06)	06:01		19:20 (WEA06)	06:56		18:26 (WEA05)	07:50		17:26 (WEA09)	07:49	08:34
	21:47	17	19:57 (WEA06)	20:55	53	20:13 (WEA06)	19:42	25	18:51 (WEA05)	18:30	19	17:45 (WEA09)	16:28	16:04
16	05:13		19:38 (WEA06)	06:03		19:21 (WEA06)	06:58		18:24 (WEA05)	07:52		17:24 (WEA09)	07:51	08:35
	21:46	21	19:59 (WEA06)	20:53	52	20:13 (WEA06)	19:40	28	18:52 (WEA05)	18:27	22	17:46 (WEA09)	16:26	16:04
17	05:15		19:38 (WEA06)	06:05		19:22 (WEA06)	06:59		18:23 (WEA05)	07:53		17:23 (WEA09)	07:52	08:36
	21:45	23	20:01 (WEA06)	20:51	50	20:12 (WEA06)	19:37	30	18:53 (WEA05)	18:25	24	17:47 (WEA09)	16:25	16:04
18	05:16		19:36 (WEA06)	06:07		19:21 (WEA06)	07:01		18:21 (WEA05)	07:55		17:22 (WEA09)	07:54	08:37
	21:44	26	20:02 (WEA06)	20:48	50	20:11 (WEA06)	19:35	31	18:52 (WEA05)	18:23	25	17:47 (WEA09)	16:24	16:04
19	05:18		19:35 (WEA06)	06:08		19:22 (WEA06)	07:03		18:21 (WEA05)	07:57		17:22 (WEA09)	07:56	08:37
	21:42	28	20:03 (WEA06)	20:46	49	20:11 (WEA06)	19:33	32	18:53 (WEA05)	18:21	25	17:47 (WEA09)	16:22	16:04
20	05:19		19:34 (WEA06)	06:10		19:23 (WEA06)	07:05		18:20 (WEA05)	07:59		17:21 (WEA09)	07:58	08:38
	21:41	31	20:05 (WEA06)	20:44	47	20:10 (WEA06)	19:30	33	18:53 (WEA05)	18:18	27	17:48 (WEA09)	16:21	16:05
21	05:20		19:33 (WEA06)	06:12		19:22 (WEA06)	07:06		18:20 (WEA05)	08:01		17:21 (WEA09)	08:00	08:39
	21:40	33	20:06 (WEA06)	20:42	46	20:08 (WEA06)	19:28	33	18:53 (WEA05)	18:16	26	17:47 (WEA09)	16:19	16:05
22	05:22		19:31 (WEA06)	06:14		19:23 (WEA06)	07:08		18:18 (WEA05)	08:03		17:21 (WEA09)	08:02	08:39
	21:38	36	20:07 (WEA06)	20:40	44	20:07 (WEA06)	19:25	34	18:52 (WEA05)	18:14	23	17:44 (WEA09)	16:18	16:06
23	05:23		19:31 (WEA06)	06:16		19:25 (WEA06)	07:10		18:18 (WEA05)	08:05		17:21 (WEA09)	08:03	08:40
	21:37	37	20:08 (WEA06)	20:37	42	20:07 (WEA06)	19:23	34	18:52 (WEA05)	18:12	21	17:42 (WEA09)	16:17	16:06
24	05:25		19:30 (WEA06)	06:17		19:25 (WEA06)	07:12		18:18 (WEA05)	08:07		17:21 (WEA09)	08:05	08:40
	21:36	39	20:09 (WEA06)	20:35	39	20:04 (WEA06)	19:20	34	18:52 (WEA05)	18:10	19	17:40 (WEA09)	16:16	16:07
25	05:26		19:30 (WEA06)	06:19		19:26 (WEA06)	07:13		18:19 (WEA05)	07:09		16:21 (WEA09)	08:07	08:40
	21:34	40	20:10 (WEA06)	20:33	37	20:03 (WEA06)	19:18	31	18:50 (WEA05)	17:07	16	16:37 (WEA09)	16:15	16:07
26	05:28		19:28 (WEA06)	06:21		19:28 (WEA06)	07:15		18:18 (WEA05)	07:10		16:22 (WEA09)	08:08	08:41
	21:32	42	20:10 (WEA06)	20:30	33	20:01 (WEA06)	19:15	29	18:47 (WEA05)	17:05	13	16:35 (WEA09)	16:14	16:08
27	05:29		19:27 (WEA06)	06:23		19:29 (WEA06)	07:17		18:18 (WEA05)	07:12		16:23 (WEA09)	08:10	08:41
	21:31	44	20:11 (WEA06)	20:28	30	19:59 (WEA06)	19:13	26	18:44 (WEA05)	17:03	10	16:33 (WEA09)	16:13	16:09
28	05:31		19:27 (WEA06)	06:24		19:32 (WEA06)	07:19		18:19 (WEA05)	07:14		16:24 (WEA09)	08:12	08:41
	21:29	45	20:12 (WEA06)	20:26	24	19:56 (WEA06)	19:10	23	18:42 (WEA05)	17:01	6	16:30 (WEA09)	16:12	16:10
29	05:33		19:26 (WEA06)	06:26		19:35 (WEA06)	07:21		18:20 (WEA05)	07:16		16:26 (WEA09)	08:13	08:41
	21:28	46	20:12 (WEA06)	20:23	18	19:53 (WEA06)	19:08	20	18:40 (WEA05)	16:59	2	16:28 (WEA09)	16:11	16:11
30	05:34		19:26 (WEA06)	06:28		19:41 (WEA06)	07:22		18:21 (WEA05)	07:18			08:15	08:41
	21:26	47	20:13 (WEA06)	20:21	4	19:45 (WEA06)	19:05	16	18:37 (WEA05)	16:57			16:10	16:12
31	05:36		19:25 (WEA06)	06:30						07:20				08:41
	21:24	48	20:13 (WEA06)	20:19						16:55				16:13
Sonnenscheinstunden	511			459			382			329			260	234
astr.max.mögl.Beschattung		619			1354			509			324			
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35			0,29			
Reduktion Betriebsdauer		0,95			0,95			0,95			0,95			
Reduktion Windrichtung		0,62			0,62			0,65			0,67			
Gesamte Reduktion		0,22			0,25			0,22			0,19			
Met.wahrsch.Beschattung		138			338			110			60			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP14 - Heinrich-Evers-Straße 4A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11				07:00		19:09 (WEA06)		05:51	05:02
	16:14		17:05				19:58	22	19:31 (WEA06)		20:53	21:43
2	08:41		08:10		07:12		06:57		19:07 (WEA06)		05:49	05:01
	16:15		17:07		18:02		20:00	26	19:33 (WEA06)		20:55	21:44
3	08:41		08:08		07:10		06:55		19:05 (WEA06)		05:47	05:00
	16:16		17:09		18:04		20:02	30	19:35 (WEA06)		20:57	21:45
4	08:41		08:06		07:07		06:52		19:04 (WEA06)		05:45	04:59
	16:17		17:11		18:06		20:04	33	19:37 (WEA06)		20:58	21:46
5	08:40		08:04		07:05		06:50		19:03 (WEA06)		05:43	04:59
	16:19		17:13		18:08		20:05	36	19:39 (WEA06)		21:00	21:47
6	08:40		08:03		07:03		17:40 (WEA05)		06:48		19:01 (WEA06)	05:41	04:58
	16:20		17:15		18:10	3	17:43 (WEA05)		20:07	38	19:39 (WEA06)	21:02	21:48
7	08:40		08:01		07:00		17:37 (WEA05)		06:45		19:00 (WEA06)	05:39	04:57
	16:21		17:17		18:12	7	17:44 (WEA05)		20:09	40	19:40 (WEA06)	21:04	21:49
8	08:39		07:59		06:58		17:35 (WEA05)		06:43		18:59 (WEA06)	05:37	04:57
	16:23		17:19		18:14	12	17:47 (WEA05)		20:11	41	19:40 (WEA06)	21:06	21:50
9	08:38		07:57		06:56		17:34 (WEA05)		06:40		18:58 (WEA06)	05:35	04:56
	16:24		17:21		18:15	15	17:49 (WEA05)		20:13	42	19:40 (WEA06)	21:07	21:51
10	08:38		07:55		06:53		17:32 (WEA05)		06:38		18:58 (WEA06)	05:33	04:55
	16:26		17:23		18:17	19	17:51 (WEA05)		20:15	43	19:41 (WEA06)	21:09	21:52
11	08:37		07:53		06:51		17:32 (WEA05)		06:36		18:57 (WEA06)	05:32	04:55
	16:27		17:25		18:19	21	17:53 (WEA05)		20:16	43	19:40 (WEA06)	21:11	21:53
12	08:36		07:51		16:55 (WEA09)	06:48	17:31 (WEA05)		06:33		18:57 (WEA06)	05:30	04:55
	16:29		17:27	2	16:57 (WEA09)	18:21	17:54 (WEA05)		20:18	43	19:40 (WEA06)	21:12	21:53
13	08:36		07:49		16:54 (WEA09)	06:46	17:30 (WEA05)		06:31		18:57 (WEA06)	05:28	04:54
	16:30		17:29	5	16:59 (WEA09)	18:23	17:57 (WEA05)		20:20	43	19:40 (WEA06)	21:14	21:54
14	08:35		07:47		16:53 (WEA09)	06:44	17:29 (WEA05)		06:29		18:57 (WEA06)	05:26	04:54
	16:32		17:31	8	17:01 (WEA09)	18:25	17:58 (WEA05)		20:22	43	19:40 (WEA06)	21:16	21:55
15	08:34		07:45		16:52 (WEA09)	06:41	17:30 (WEA05)		06:26		18:56 (WEA06)	05:25	04:54
	16:33		17:33	12	17:04 (WEA09)	18:27	17:59 (WEA05)		20:24	43	19:39 (WEA06)	21:18	21:55
16	08:33		07:43		16:52 (WEA09)	06:39	17:29 (WEA05)		06:24		18:56 (WEA06)	05:23	04:54
	16:35		17:35	14	17:06 (WEA09)	18:29	17:58 (WEA05)		20:26	43	19:39 (WEA06)	21:19	21:56
17	08:32		07:41		16:51 (WEA09)	06:36	17:30 (WEA05)		06:22		18:57 (WEA06)	05:21	04:54
	16:37		17:37	16	17:07 (WEA09)	18:30	17:57 (WEA05)		20:27	41	19:38 (WEA06)	21:21	21:56
18	08:31		07:39		16:51 (WEA09)	06:34	17:29 (WEA05)		06:19		18:57 (WEA06)	05:20	04:54
	16:39		17:39	19	17:10 (WEA09)	18:32	17:56 (WEA05)		20:29	41	19:38 (WEA06)	21:22	21:57
19	08:30		07:37		16:51 (WEA09)	06:31	17:30 (WEA05)		06:17		18:57 (WEA06)	05:18	04:54
	16:40		17:41	21	17:12 (WEA09)	18:34	17:55 (WEA05)		20:31	39	19:36 (WEA06)	21:24	21:57
20	08:29		07:35		16:52 (WEA09)	06:29	17:32 (WEA05)		06:15		18:58 (WEA06)	05:17	04:54
	16:42		17:43	22	17:14 (WEA09)	18:36	17:55 (WEA05)		20:33	37	19:35 (WEA06)	21:26	21:58
21	08:27		07:32		16:51 (WEA09)	06:27	17:32 (WEA05)		06:13		18:59 (WEA06)	05:15	04:54
	16:44		17:44	22	17:13 (WEA09)	18:38	17:52 (WEA05)		20:35	35	19:34 (WEA06)	21:27	21:58
22	08:26		07:30		16:52 (WEA09)	06:24	17:34 (WEA05)		06:10		19:00 (WEA06)	05:14	04:54
	16:46		17:46	21	17:13 (WEA09)	18:40	17:51 (WEA05)		20:37	33	19:33 (WEA06)	21:29	21:58
23	08:25		07:28		16:53 (WEA09)	06:22	17:37 (WEA05)		06:08		19:01 (WEA06)	05:12	04:54
	16:48		17:48	19	17:12 (WEA09)	18:42	17:47 (WEA05)		20:38	31	19:32 (WEA06)	21:30	21:58
24	08:24		07:26		16:55 (WEA09)	06:19			06:06		19:02 (WEA06)	05:11	04:54
	16:49		17:50	16	17:11 (WEA09)	18:43			20:40	29	19:31 (WEA06)	21:32	21:58
25	08:22		07:23		16:56 (WEA09)	06:17			06:04		19:04 (WEA06)	05:10	04:55
	16:51		17:52	12	17:08 (WEA09)	18:45			20:42	25	19:29 (WEA06)	21:33	21:58
26	08:21		07:21		17:00 (WEA09)	06:14			06:02		19:05 (WEA06)	05:09	04:55
	16:53		17:54	5	17:05 (WEA09)	18:47			20:44	21	19:26 (WEA06)	21:35	21:58
27	08:19		07:19			06:12			05:59		19:07 (WEA06)	05:07	04:56
	16:55		17:56			18:49			20:46	16	19:23 (WEA06)	21:36	21:58
28	08:18		07:17			06:09			05:57		19:12 (WEA06)	05:06	04:56
	16:57		17:58			18:51			20:48	6	19:18 (WEA06)	21:37	21:58
29	08:16					07:07			05:55			05:05	04:57
	16:59					19:53			20:49			21:39	21:58
30	08:15					07:05	19:16 (WEA06)		05:53			05:04	04:57
	17:01					19:54	12	19:28 (WEA06)	20:51			21:40	21:58
31	08:13					07:02		19:12 (WEA06)				05:03	
	17:03					19:56	18	19:30 (WEA06)				21:41	
Sonnenscheinstunden	251		274			367			420			493	509
astr.max.mögl.Beschattung				214			393			963			
Red.Sonnenscheinwahrsch.				0,24			0,28			0,37			
Reduktion Betriebsdauer				0,95			0,95			0,95			
Reduktion Windrichtung				0,67			0,65			0,65			
Gesamte Reduktion				0,15			0,17			0,23			
Met.wahrsch.Beschattung				33			67			220			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP14 - Heinrich-Evers-Straße 4A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November		Dezember
1	04:58		05:38		06:31		18:57 (WEA06)	07:24		18:09 (WEA05)	07:22	08:17
	21:57		21:22		20:16	43	19:40 (WEA06)	19:03	25	18:34 (WEA05)	16:53	16:09
2	04:59		05:39		06:33		18:56 (WEA06)	07:26		18:10 (WEA05)	07:24	08:18
	21:57		21:21		20:14	43	19:39 (WEA06)	19:01	22	18:32 (WEA05)	16:51	16:08
3	05:00		05:41		06:35		18:56 (WEA06)	07:28		18:10 (WEA05)	07:26	08:20
	21:57		21:19		20:12	42	19:38 (WEA06)	18:58	20	18:30 (WEA05)	16:49	16:08
4	05:00		05:43		06:37		18:57 (WEA06)	07:30		18:11 (WEA05)	07:28	08:21
	21:56		21:17		20:09	41	19:38 (WEA06)	18:56	16	18:27 (WEA05)	16:47	16:07
5	05:01		05:44		06:38		18:56 (WEA06)	07:31		18:12 (WEA05)	07:30	08:22
	21:56		21:15		20:07	40	19:36 (WEA06)	18:53	13	18:25 (WEA05)	16:45	16:06
6	05:02		05:46		06:40		18:57 (WEA06)	07:33		18:13 (WEA05)	07:32	08:24
	21:55		21:13		20:04	39	19:36 (WEA06)	18:51	10	18:23 (WEA05)	16:43	16:06
7	05:03		05:48		06:42		18:58 (WEA06)	07:35		18:14 (WEA05)	07:34	08:25
	21:54		21:11		20:02	36	19:34 (WEA06)	18:49	5	18:19 (WEA05)	16:41	16:05
8	05:04		05:49		06:44		18:58 (WEA06)	07:37			07:35	08:26
	21:54		21:09		19:59	33	19:31 (WEA06)	18:46			16:40	16:05
9	05:05		05:51		06:45		18:59 (WEA06)	07:39			07:37	08:28
	21:53		21:07		19:57	30	19:29 (WEA06)	18:44			16:38	16:05
10	05:06		05:53		06:47		19:00 (WEA06)	07:40			07:39	08:29
	21:52		21:05		19:55	27	19:27 (WEA06)	18:41			16:36	16:04
11	05:07		05:55		06:49		19:01 (WEA06)	07:42			07:41	08:30
	21:51		21:03		19:52	23	19:24 (WEA06)	18:39			16:34	16:04
12	05:08		05:56		06:51		19:03 (WEA06)	07:44			07:43	08:31
	21:50		21:01		19:50	19	19:22 (WEA06)	18:37			16:33	16:04
13	05:10		05:58		06:52		19:07 (WEA06)	07:46			07:45	08:32
	21:49		20:59		19:47	12	19:19 (WEA06)	18:34			16:31	16:04
14	05:11		06:00		06:54			07:48			07:47	08:33
	21:48		20:57		19:45			18:32			16:30	16:04
15	05:12		06:01	19:18 (WEA06)	06:56			07:50			07:49	08:34
	21:47		20:55	9 19:27 (WEA06)	19:42			18:30			16:28	16:04
16	05:13		06:03	19:14 (WEA06)	06:58			07:52		17:30 (WEA09)	07:51	08:35
	21:46		20:53	17 19:31 (WEA06)	19:40			18:27	9	17:39 (WEA09)	16:26	16:04
17	05:15		06:05	19:12 (WEA06)	06:59			07:53		17:27 (WEA09)	07:52	08:36
	21:45		20:51	22 19:34 (WEA06)	19:37			18:25	14	17:41 (WEA09)	16:25	16:04
18	05:16		06:07	19:09 (WEA06)	07:01			07:55		17:25 (WEA09)	07:54	08:37
	21:44		20:48	26 19:35 (WEA06)	19:35			18:23	18	17:43 (WEA09)	16:24	16:04
19	05:17		06:08	19:07 (WEA06)	07:03			07:57		17:24 (WEA09)	07:56	08:37
	21:42		20:46	30 19:37 (WEA06)	19:33			18:21	20	17:44 (WEA09)	16:22	16:04
20	05:19		06:10	19:06 (WEA06)	07:05		18:24 (WEA05)	07:59		17:23 (WEA09)	07:58	08:38
	21:41		20:44	32 19:38 (WEA06)	19:30	8	18:32 (WEA05)	18:18	21	17:44 (WEA09)	16:21	16:05
21	05:20		06:12	19:04 (WEA06)	07:06		18:21 (WEA05)	08:01		17:22 (WEA09)	08:00	08:39
	21:40		20:42	34 19:38 (WEA06)	19:28	14	18:35 (WEA05)	18:16	23	17:45 (WEA09)	16:19	16:05
22	05:22		06:14	19:03 (WEA06)	07:08		18:17 (WEA05)	08:03		17:22 (WEA09)	08:02	08:39
	21:38		20:40	36 19:39 (WEA06)	19:25	19	18:36 (WEA05)	18:14	22	17:44 (WEA09)	16:18	16:06
23	05:23		06:16	19:02 (WEA06)	07:10		18:16 (WEA05)	08:05		17:21 (WEA09)	08:03	08:40
	21:37		20:37	38 19:40 (WEA06)	19:23	22	18:38 (WEA05)	18:12	21	17:42 (WEA09)	16:17	16:06
24	05:25		06:17	19:01 (WEA06)	07:12		18:14 (WEA05)	08:07		17:21 (WEA09)	08:05	08:40
	21:35		20:35	39 19:40 (WEA06)	19:20	25	18:39 (WEA05)	18:10	19	17:40 (WEA09)	16:16	16:07
25	05:26		06:19	19:00 (WEA06)	07:13		18:13 (WEA05)	07:09		16:21 (WEA09)	08:07	08:40
	21:34		20:33	41 19:41 (WEA06)	19:18	27	18:40 (WEA05)	17:07	16	16:37 (WEA09)	16:15	16:07
26	05:28		06:21	19:00 (WEA06)	07:15		18:12 (WEA05)	07:10		16:22 (WEA09)	08:08	08:41
	21:32		20:30	41 19:41 (WEA06)	19:15	27	18:39 (WEA05)	17:05	13	16:35 (WEA09)	16:14	16:08
27	05:29		06:23	18:58 (WEA06)	07:17		18:11 (WEA05)	07:12		16:22 (WEA09)	08:10	08:41
	21:31		20:28	42 19:40 (WEA06)	19:13	28	18:39 (WEA05)	17:03	11	16:33 (WEA09)	16:13	16:09
28	05:31		06:24	18:58 (WEA06)	07:19		18:11 (WEA05)	07:14		16:23 (WEA09)	08:12	08:41
	21:29		20:26	43 19:41 (WEA06)	19:10	28	18:39 (WEA05)	17:01	7	16:30 (WEA09)	16:12	16:10
29	05:33		06:26	18:58 (WEA06)	07:21		18:10 (WEA05)	07:16		16:23 (WEA09)	08:13	08:41
	21:28		20:23	43 19:41 (WEA06)	19:08	29	18:39 (WEA05)	16:59	5	16:28 (WEA09)	16:11	16:11
30	05:34		06:28	18:57 (WEA06)	07:22		18:10 (WEA05)	07:18		16:25 (WEA09)	08:15	08:41
	21:26		20:21	43 19:40 (WEA06)	19:05	27	18:37 (WEA05)	16:57	1	16:26 (WEA09)	16:10	16:12
31	05:36		06:30	18:57 (WEA06)				07:20				08:41
	21:24		20:19	43 19:40 (WEA06)				16:55				16:13
Sonnenscheinstunden	511		459		382			329			260	234
astr.max.mögl.Beschattung				579		682			331			
Red.Sonnenscheinwahrsch.				0,42		0,35			0,29			
Reduktion Betriebsdauer				0,95		0,95			0,95			
Reduktion Windrichtung				0,65		0,65			0,67			
Gesamte Reduktion				0,26		0,21			0,18			
Met.wahrsch.Beschattung				150		146			61			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP15 - Heinrich-Evers-Straße 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März			April			Mai		Juni	
1	08:41		08:11		07:14			07:00			05:51		05:02	
	16:14		17:05		18:00			19:58			20:53		21:43	
2	08:41		08:10		07:12			06:57			05:49		05:01	
	16:15		17:07		18:02			20:00			20:55		21:44	
3	08:41		08:08		07:10			06:55			05:47		05:00	
	16:16		17:09		18:04			20:02			20:57		21:45	
4	08:41		08:06		07:07			06:52			05:45		04:59	
	16:17		17:11		18:06			20:04			20:58		21:46	
5	08:40		08:04		07:05			06:50		19:32 (WEA06)	05:43		04:59	
	16:19		17:13		18:08			20:05	7	19:39 (WEA06)	21:00		21:47	
6	08:40		08:03		07:03			06:48		19:27 (WEA06)	05:41		04:58	
	16:20		17:15		18:10			20:07	13	19:40 (WEA06)	21:02		21:48	
7	08:40		08:01		07:00			06:45		19:25 (WEA06)	05:39		04:57	
	16:21		17:17		18:12			20:09	17	19:42 (WEA06)	21:04		21:49	
8	08:39		07:59		06:58			06:43		19:22 (WEA06)	05:37		04:57	
	16:23		17:19		18:14			20:11	21	19:43 (WEA06)	21:06		21:50	
9	08:38		07:57		06:56			06:40		19:21 (WEA06)	05:35		04:56	
	16:24		17:21		18:15			20:13	24	19:45 (WEA06)	21:07		21:51	
10	08:38		07:55		06:53			06:38		19:20 (WEA06)	05:33		04:55	
	16:26		17:23		18:17			20:15	28	19:48 (WEA06)	21:09		21:52	
11	08:37		07:53		06:51			06:36		19:18 (WEA06)	05:32		04:55	
	16:27		17:25		18:19			20:16	31	19:49 (WEA06)	21:11		21:53	
12	08:36		07:51		06:48			06:33		19:17 (WEA06)	05:30		04:55	
	16:29		17:27		18:21			20:18	34	19:51 (WEA06)	21:12		21:53	
13	08:36		07:49		06:46		17:53 (WEA05)	06:31		19:17 (WEA06)	05:28		04:54	
	16:30		17:29		18:23	4	17:57 (WEA05)	20:20	35	19:52 (WEA06)	21:14		21:54	
14	08:35		07:47		06:44		17:50 (WEA05)	06:29		19:17 (WEA06)	05:26		04:54	
	16:32		17:31		18:25	8	17:58 (WEA05)	20:22	36	19:53 (WEA06)	21:16		21:55	
15	08:34		07:45		06:41		17:49 (WEA05)	06:26		19:15 (WEA06)	05:25		04:54	
	16:33		17:33		18:27	11	18:00 (WEA05)	20:24	37	19:52 (WEA06)	21:18		21:55	
16	08:33		07:43		06:39		17:47 (WEA05)	06:24		19:15 (WEA06)	05:23		04:54	
	16:35		17:35		18:29	15	18:02 (WEA05)	20:26	37	19:52 (WEA06)	21:19		21:56	
17	08:32		07:41		06:36		17:47 (WEA05)	06:22		19:15 (WEA06)	05:21		04:54	
	16:37		17:37		18:30	17	18:04 (WEA05)	20:27	37	19:52 (WEA06)	21:21		21:56	
18	08:31		07:39		06:34		17:45 (WEA05)	06:19		19:15 (WEA06)	05:20		04:54	
	16:39		17:39		18:32	20	18:05 (WEA05)	20:29	37	19:52 (WEA06)	21:22		21:57	
19	08:30		07:37		06:31		17:45 (WEA05)	06:17		19:14 (WEA06)	05:18		04:54	
	16:40		17:41		18:34	23	18:08 (WEA05)	20:31	37	19:51 (WEA06)	21:24		21:57	
20	08:29		07:34		06:29		17:45 (WEA05)	06:15		19:15 (WEA06)	05:17		04:54	
	16:42		17:43		18:36	25	18:10 (WEA05)	20:33	36	19:51 (WEA06)	21:26		21:58	
21	08:27		07:32		06:27		17:44 (WEA05)	06:13		19:15 (WEA06)	05:15		04:54	
	16:44		17:44		18:38	27	18:11 (WEA05)	20:35	35	19:50 (WEA06)	21:27		21:58	
22	08:26		07:30		06:24		17:45 (WEA05)	06:10		19:15 (WEA06)	05:14		04:54	
	16:46		17:46		18:40	26	18:11 (WEA05)	20:37	35	19:50 (WEA06)	21:29		21:58	
23	08:25		07:28		06:22		17:45 (WEA05)	06:08		19:16 (WEA06)	05:12		04:54	
	16:48		17:48		18:42	24	18:09 (WEA05)	20:38	33	19:49 (WEA06)	21:30		21:58	
24	08:24		07:26		06:19		17:45 (WEA05)	06:06		19:17 (WEA06)	05:11		04:54	
	16:49		17:50		18:43	24	18:09 (WEA05)	20:40	31	19:48 (WEA06)	21:32		21:58	
25	08:22		07:23		06:17		17:46 (WEA05)	06:04		19:17 (WEA06)	05:10		04:55	
	16:51		17:52		18:45	21	18:07 (WEA05)	20:42	30	19:47 (WEA06)	21:33		21:58	
26	08:21		07:21		06:14		17:47 (WEA05)	06:02		19:17 (WEA06)	05:09		04:55	
	16:53		17:54		18:47	19	18:06 (WEA05)	20:44	28	19:45 (WEA06)	21:35		21:58	
27	08:19		07:19		06:12		17:48 (WEA05)	05:59		19:19 (WEA06)	05:07		04:56	
	16:55		17:56		18:49	15	18:03 (WEA05)	20:46	25	19:44 (WEA06)	21:36		21:58	
28	08:18		07:17		06:09		17:51 (WEA05)	05:57		19:20 (WEA06)	05:06		04:56	
	16:57		17:58		18:51	9	18:00 (WEA05)	20:48	22	19:42 (WEA06)	21:37		21:58	
29	08:16				07:07			05:55		19:22 (WEA06)	05:05		04:57	
	16:59				19:53			20:49	18	19:40 (WEA06)	21:39		21:58	
30	08:15				07:05			05:53		19:25 (WEA06)	05:04		04:57	
	17:01				19:54			20:51	12	19:37 (WEA06)	21:40		21:58	
31	08:13				07:02						05:03			
	17:03				19:56						21:41			
Sonnenscheinstunden	251		274		367			420			493		509	
astr.max.mögl.Beschattung						288			736					
Red.Sonnenscheinwahrsch.						0,28			0,37					
Reduktion Betriebsdauer						0,95			0,95					
Reduktion Windrichtung						0,65			0,64					
Gesamte Reduktion						0,17			0,22					
Met.wahrsch.Beschattung						50			166					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP15 - Heinrich-Evers-Straße 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September			Oktober		Novembe	Dezember
1	04:58		05:38			06:31		19:18 (WEA06)	07:24		07:22	08:17
	21:57		21:22			20:16	30	19:48 (WEA06)	19:03		16:53	16:09
2	04:59		05:39			06:33		19:18 (WEA06)	07:26		07:24	08:18
	21:57		21:21			20:14	27	19:45 (WEA06)	19:01		16:51	16:08
3	05:00		05:41			06:35		19:19 (WEA06)	07:28		07:26	08:20
	21:57		21:19			20:12	24	19:43 (WEA06)	18:58		16:49	16:08
4	05:00		05:43			06:37		19:20 (WEA06)	07:30		07:28	08:21
	21:56		21:17			20:09	21	19:41 (WEA06)	18:56		16:47	16:07
5	05:01		05:44			06:38		19:21 (WEA06)	07:31		07:30	08:22
	21:55		21:15			20:07	17	19:38 (WEA06)	18:53		16:45	16:06
6	05:02		05:46			06:40		19:23 (WEA06)	07:33		07:32	08:24
	21:55		21:13			20:04	13	19:36 (WEA06)	18:51		16:43	16:06
7	05:03		05:48			06:42		19:27 (WEA06)	07:35		07:34	08:25
	21:54		21:11			20:02	7	19:34 (WEA06)	18:49		16:41	16:05
8	05:04		05:49			06:44			07:37		07:35	08:26
	21:54		21:09			19:59			18:46		16:40	16:05
9	05:05		05:51			06:45			07:39		07:37	08:28
	21:53		21:07			19:57			18:44		16:38	16:05
10	05:06		05:53			06:47			07:40		07:39	08:29
	21:52		21:05			19:55			18:41		16:36	16:04
11	05:07		05:55			06:49			07:42		07:41	08:30
	21:51		21:03			19:52			18:39		16:34	16:04
12	05:08		05:56		19:37 (WEA06)	06:51			07:44		07:43	08:31
	21:50		21:01	4	19:41 (WEA06)	19:50			18:37		16:33	16:04
13	05:10		05:58		19:32 (WEA06)	06:52			07:46		07:45	08:32
	21:49		20:59	14	19:46 (WEA06)	19:47			18:34		16:31	16:04
14	05:11		06:00		19:30 (WEA06)	06:54			07:48		07:47	08:33
	21:48		20:57	19	19:49 (WEA06)	19:45			18:32		16:30	16:04
15	05:12		06:01		19:27 (WEA06)	06:56		18:42 (WEA05)	07:50		07:49	08:34
	21:47		20:55	23	19:50 (WEA06)	19:42	7	18:49 (WEA05)	18:30		16:28	16:04
16	05:13		06:03		19:26 (WEA06)	06:58		18:38 (WEA05)	07:52		07:51	08:35
	21:46		20:53	26	19:52 (WEA06)	19:40	14	18:52 (WEA05)	18:27		16:26	16:04
17	05:15		06:05		19:25 (WEA06)	06:59		18:36 (WEA05)	07:53		07:52	08:36
	21:45		20:51	28	19:53 (WEA06)	19:37	18	18:54 (WEA05)	18:25		16:25	16:04
18	05:16		06:07		19:23 (WEA06)	07:01		18:33 (WEA05)	07:55		07:54	08:37
	21:44		20:48	30	19:53 (WEA06)	19:35	21	18:54 (WEA05)	18:23		16:24	16:04
19	05:17		06:08		19:22 (WEA06)	07:03		18:32 (WEA05)	07:57		07:56	08:37
	21:42		20:46	32	19:54 (WEA06)	19:32	23	18:55 (WEA05)	18:21		16:22	16:04
20	05:19		06:10		19:21 (WEA06)	07:05		18:31 (WEA05)	07:59		07:58	08:38
	21:41		20:44	34	19:55 (WEA06)	19:30	25	18:56 (WEA05)	18:18		16:21	16:05
21	05:20		06:12		19:20 (WEA06)	07:06		18:31 (WEA05)	08:01		08:00	08:39
	21:40		20:42	35	19:55 (WEA06)	19:28	25	18:56 (WEA05)	18:16		16:19	16:05
22	05:22		06:14		19:19 (WEA06)	07:08		18:29 (WEA05)	08:03		08:02	08:39
	21:38		20:40	36	19:55 (WEA06)	19:25	26	18:55 (WEA05)	18:14		16:18	16:06
23	05:23		06:16		19:19 (WEA06)	07:10		18:29 (WEA05)	08:05		08:03	08:40
	21:37		20:37	37	19:56 (WEA06)	19:23	25	18:54 (WEA05)	18:12		16:17	16:06
24	05:25		06:17		19:18 (WEA06)	07:12		18:29 (WEA05)	08:07		08:05	08:40
	21:35		20:35	37	19:55 (WEA06)	19:20	23	18:52 (WEA05)	18:10		16:16	16:07
25	05:26		06:19		19:18 (WEA06)	07:13		18:29 (WEA05)	07:09		08:07	08:40
	21:34		20:33	37	19:55 (WEA06)	19:18	21	18:50 (WEA05)	17:07		16:15	16:07
26	05:28		06:21		19:18 (WEA06)	07:15		18:28 (WEA05)	07:10		08:08	08:41
	21:32		20:30	37	19:55 (WEA06)	19:15	19	18:47 (WEA05)	17:05		16:14	16:08
27	05:29		06:23		19:17 (WEA06)	07:17		18:29 (WEA05)	07:12		08:10	08:41
	21:31		20:28	37	19:54 (WEA06)	19:13	15	18:44 (WEA05)	17:03		16:13	16:09
28	05:31		06:24		19:17 (WEA06)	07:19		18:29 (WEA05)	07:14		08:12	08:41
	21:29		20:26	37	19:54 (WEA06)	19:10	13	18:42 (WEA05)	17:01		16:12	16:10
29	05:33		06:26		19:17 (WEA06)	07:21		18:31 (WEA05)	07:16		08:13	08:41
	21:28		20:23	37	19:54 (WEA06)	19:08	9	18:40 (WEA05)	16:59		16:11	16:11
30	05:34		06:28		19:17 (WEA06)	07:22		18:32 (WEA05)	07:18		08:15	08:41
	21:26		20:21	35	19:52 (WEA06)	19:05	5	18:37 (WEA05)	16:57		16:10	16:12
31	05:36		06:30		19:17 (WEA06)				07:20			08:41
	21:24		20:19	33	19:50 (WEA06)				16:55			16:13
Sonnenscheinstunden	511		459			382			329		260	234
astr.max.mögl.Beschattung				608			428					
Red.Sonnenscheinwahrsch.				0,42			0,35					
Reduktion Betriebsdauer				0,95			0,95					
Reduktion Windrichtung				0,64			0,65					
Gesamte Reduktion				0,26			0,21					
Met.wahrsch.Beschattung				155			92					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP16 - Kleiner Köven 15A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar			März			April		Mai	Juni
1	08:41	08:11			07:14		17:20 (WEA06)	07:00		05:51	05:02
	16:14	17:05			18:00	13	17:33 (WEA06)	19:58		20:53	21:43
2	08:41	08:10			07:12		17:18 (WEA06)	06:57		05:49	05:01
	16:15	17:07			18:02	16	17:34 (WEA06)	20:00		20:55	21:44
3	08:41	08:08			07:10		17:17 (WEA06)	06:55		05:47	05:00
	16:16	17:09			18:04	20	17:37 (WEA06)	20:02		20:57	21:45
4	08:41	08:06			07:07		17:17 (WEA06)	06:52		05:45	04:59
	16:17	17:11			18:06	22	17:39 (WEA06)	20:04		20:58	21:46
5	08:40	08:04			07:05		17:16 (WEA06)	06:50		05:43	04:58
	16:19	17:13			18:08	25	17:41 (WEA06)	20:05		21:00	21:47
6	08:40	08:03			07:03		17:16 (WEA06)	06:48		05:41	04:58
	16:20	17:15			18:10	27	17:43 (WEA06)	20:07		21:02	21:48
7	08:40	08:01			07:00		17:15 (WEA06)	06:45		05:39	04:57
	16:21	17:17			18:12	29	17:44 (WEA06)	20:09		21:04	21:49
8	08:39	07:59			06:58		17:15 (WEA06)	06:43		05:37	04:56
	16:23	17:19			18:13	29	17:44 (WEA06)	20:11		21:06	21:50
9	08:38	07:57			06:56		17:15 (WEA06)	06:40		05:35	04:56
	16:24	17:21			18:15	29	17:44 (WEA06)	20:13		21:07	21:51
10	08:38	07:55			06:53		17:15 (WEA06)	06:38		05:33	04:55
	16:25	17:23			18:17	28	17:43 (WEA06)	20:15		21:09	21:52
11	08:37	07:53			06:51		17:16 (WEA06)	06:36		05:32	04:55
	16:27	17:25			18:19	26	17:42 (WEA06)	20:16		21:11	21:53
12	08:36	07:51			06:48		17:16 (WEA06)	06:33		05:30	04:55
	16:29	17:27			18:21	25	17:41 (WEA06)	20:18		21:12	21:53
13	08:36	07:49			06:46		17:18 (WEA06)	06:31		05:28	04:54
	16:30	17:29			18:23	22	17:40 (WEA06)	20:20		21:14	21:54
14	08:35	07:47			06:44		17:18 (WEA06)	06:29		05:26	04:54
	16:32	17:31			18:25	19	17:37 (WEA06)	20:22		21:16	21:55
15	08:34	07:45			06:41		17:21 (WEA06)	06:26		05:25	04:54
	16:33	17:33			18:27	14	17:35 (WEA06)	20:24		21:18	21:55
16	08:33	07:43			06:39		17:24 (WEA06)	06:24		05:23	04:54
	16:35	17:35			18:29	6	17:30 (WEA06)	20:26		21:19	21:56
17	08:32	07:41			06:36			06:22		05:21	04:54
	16:37	17:37			18:30			20:27		21:21	21:56
18	08:31	07:39			06:34			06:19		05:20	04:53
	16:38	17:39			18:32			20:29		21:22	21:57
19	08:30	07:37			06:31			06:17		05:18	04:53
	16:40	17:41			18:34			20:31		21:24	21:57
20	08:29	07:34			06:29			06:15		05:17	04:54
	16:42	17:42			18:36			20:33		21:26	21:58
21	08:27	07:32			06:27			06:13		05:15	04:54
	16:44	17:44			18:38			20:35		21:27	21:58
22	08:26	07:30			06:24			06:10		05:14	04:54
	16:46	17:46			18:40			20:37		21:29	21:58
23	08:25	07:28			06:22			06:08		05:12	04:54
	16:47	17:48			18:42			20:38		21:30	21:58
24	08:24	07:26			06:19			06:06		05:11	04:54
	16:49	17:50			18:43			20:40		21:32	21:58
25	08:22	07:23			06:17			06:04		05:10	04:55
	16:51	17:52			18:45			20:42		21:33	21:58
26	08:21	07:21		17:26 (WEA06)	06:14			06:02		05:08	04:55
	16:53	17:54	1	17:27 (WEA06)	18:47			20:44		21:35	21:58
27	08:19	07:19		17:23 (WEA06)	06:12			05:59		05:07	04:56
	16:55	17:56	6	17:29 (WEA06)	18:49			20:46		21:36	21:58
28	08:18	07:17		17:21 (WEA06)	06:09			05:57		05:06	04:56
	16:57	17:58	10	17:31 (WEA06)	18:51			20:48		21:37	21:58
29	08:16				07:07			05:55		05:05	04:57
	16:59				19:53			20:49		21:39	21:58
30	08:15				07:05			05:53		05:04	04:57
	17:01				19:54			20:51		21:40	21:58
31	08:13				07:02					05:03	
	17:03				19:56					21:41	
Sonnenscheinstunden	251	274			367			420		493	509
astr.max.mögl.Beschattung			17			350					
Red.Sonnenscheinwahrsch.			0,24			0,28					
Reduktion Betriebsdauer			0,95			0,95					
Reduktion Windrichtung			0,65			0,65					
Gesamte Reduktion			0,15			0,17					
Met.wahrsch.Beschattung			3			60					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP16 - Kleiner Köven 15A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September			Oktober			November	Dezember
1	04:58	05:37	06:31			07:24		17:55 (WEA06)	07:22	08:17
	21:57	21:22	20:16			19:03	24	18:19 (WEA06)	16:53	16:09
2	04:59	05:39	06:33			07:26		17:54 (WEA06)	07:24	08:18
	21:57	21:21	20:14			19:01	26	18:20 (WEA06)	16:51	16:08
3	04:59	05:41	06:35			07:28		17:53 (WEA06)	07:26	08:20
	21:57	21:19	20:12			18:58	28	18:21 (WEA06)	16:49	16:07
4	05:00	05:42	06:37			07:30		17:53 (WEA06)	07:28	08:21
	21:56	21:17	20:09			18:56	28	18:21 (WEA06)	16:47	16:07
5	05:01	05:44	06:38			07:31		17:52 (WEA06)	07:30	08:22
	21:56	21:15	20:07			18:53	29	18:21 (WEA06)	16:45	16:06
6	05:02	05:46	06:40			07:33		17:52 (WEA06)	07:32	08:24
	21:55	21:13	20:04			18:51	29	18:21 (WEA06)	16:43	16:06
7	05:03	05:48	06:42			07:35		17:51 (WEA06)	07:34	08:25
	21:54	21:11	20:02			18:49	28	18:19 (WEA06)	16:41	16:05
8	05:04	05:49	06:44			07:37		17:51 (WEA06)	07:35	08:26
	21:54	21:09	19:59			18:46	26	18:17 (WEA06)	16:40	16:05
9	05:05	05:51	06:45			07:39		17:51 (WEA06)	07:37	08:28
	21:53	21:07	19:57			18:44	24	18:15 (WEA06)	16:38	16:04
10	05:06	05:53	06:47			07:40		17:51 (WEA06)	07:39	08:29
	21:52	21:05	19:55			18:41	21	18:12 (WEA06)	16:36	16:04
11	05:07	05:54	06:49			07:42		17:51 (WEA06)	07:41	08:30
	21:51	21:03	19:52			18:39	19	18:10 (WEA06)	16:34	16:04
12	05:08	05:56	06:51			07:44		17:52 (WEA06)	07:43	08:31
	21:50	21:01	19:50			18:37	16	18:08 (WEA06)	16:33	16:04
13	05:10	05:58	06:52			07:46		17:53 (WEA06)	07:45	08:32
	21:49	20:59	19:47			18:34	12	18:05 (WEA06)	16:31	16:04
14	05:11	06:00	06:54			07:48		17:55 (WEA06)	07:47	08:33
	21:48	20:57	19:45			18:32	8	18:03 (WEA06)	16:29	16:04
15	05:12	06:01	06:56			07:50		17:56 (WEA06)	07:49	08:34
	21:47	20:55	19:42			18:30	5	18:01 (WEA06)	16:28	16:04
16	05:13	06:03	06:58			07:52			07:51	08:35
	21:46	20:53	19:40			18:27			16:26	16:04
17	05:15	06:05	06:59			07:53			07:52	08:36
	21:45	20:51	19:37			18:25			16:25	16:04
18	05:16	06:07	07:01			07:55			07:54	08:37
	21:44	20:48	19:35			18:23			16:23	16:04
19	05:17	06:08	07:03			07:57			07:56	08:37
	21:42	20:46	19:32			18:21			16:22	16:04
20	05:19	06:10	07:05			07:59			07:58	08:38
	21:41	20:44	19:30			18:18			16:21	16:05
21	05:20	06:12	07:06			08:01			08:00	08:39
	21:40	20:42	19:28			18:16			16:19	16:05
22	05:22	06:14	07:08			08:03			08:02	08:39
	21:38	20:40	19:25			18:14			16:18	16:06
23	05:23	06:15	07:10			08:05			08:03	08:40
	21:37	20:37	19:23			18:12			16:17	16:06
24	05:25	06:17	07:12			08:07			08:05	08:40
	21:35	20:35	19:20			18:10			16:16	16:07
25	05:26	06:19	07:13			07:09			08:07	08:40
	21:34	20:33	19:18			17:07			16:15	16:07
26	05:28	06:21	07:15			07:10			08:08	08:41
	21:32	20:30	19:15			17:05			16:14	16:08
27	05:29	06:23	07:17			07:12			08:10	08:41
	21:31	20:28	19:13			17:03			16:13	16:09
28	05:31	06:24	07:19		18:03 (WEA06)	07:14			08:12	08:41
	21:29	20:26	19:10	12	18:15 (WEA06)	17:01			16:12	16:10
29	05:33	06:26	07:21		18:00 (WEA06)	07:16			08:13	08:41
	21:28	20:23	19:08	17	18:17 (WEA06)	16:59			16:11	16:11
30	05:34	06:28	07:22		17:58 (WEA06)	07:18			08:15	08:41
	21:26	20:21	19:05	21	18:19 (WEA06)	16:57			16:10	16:11
31	05:36	06:30				07:20				08:41
	21:24	20:19				16:55				16:12
Sonnenscheinstunden	511	459	382			329			260	234
astr.max.mögl.Beschattung				50			323			
Red.Sonnenscheinwahrsch.				0,35			0,29			
Reduktion Betriebsdauer				0,95			0,95			
Reduktion Windrichtung				0,65			0,65			
Gesamte Reduktion				0,22			0,18			
Met.wahrsch.Beschattung				11			58			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP17 - An der Gösche 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März			April			Mai			Juni
1	08:41	08:11	07:14			07:00		19:05 (WEA05)	05:51		19:39 (WEA06)	05:02
	16:14	17:05	18:00			19:58	19	19:24 (WEA05)	20:53	22	20:01 (WEA06)	21:43
2	08:41	08:10	07:12			06:57		19:06 (WEA05)	05:49		19:41 (WEA06)	05:01
	16:15	17:07	18:02			20:00	17	19:23 (WEA05)	20:55	19	20:00 (WEA06)	21:44
3	08:41	08:08	07:10			06:55		19:07 (WEA05)	05:47		19:43 (WEA06)	05:00
	16:16	17:09	18:04			20:02	13	19:20 (WEA05)	20:57	16	19:59 (WEA06)	21:45
4	08:41	08:06	07:07			06:52		19:11 (WEA05)	05:45		19:45 (WEA06)	04:59
	16:17	17:11	18:06			20:04	5	19:16 (WEA05)	20:58	11	19:56 (WEA06)	21:46
5	08:40	08:04	07:05			06:50			05:43			04:59
	16:19	17:13	18:08			20:05			21:00			21:47
6	08:40	08:03	07:03			06:48			05:41			04:58
	16:20	17:15	18:10			20:07			21:02			21:48
7	08:40	08:01	07:00			06:45			05:39			04:57
	16:21	17:17	18:12			20:09			21:04			21:49
8	08:39	07:59	06:58			06:43			05:37			04:57
	16:23	17:19	18:13			20:11			21:05			21:50
9	08:38	07:57	06:56			06:40			05:35			04:56
	16:24	17:21	18:15			20:13			21:07			21:51
10	08:38	07:55	06:53			06:38			05:33			04:55
	16:26	17:23	18:17			20:15			21:09			21:52
11	08:37	07:53	06:51			06:36			05:32			04:55
	16:27	17:25	18:19			20:16			21:11			21:53
12	08:36	07:51	06:48			06:33			05:30			04:55
	16:29	17:27	18:21			20:18			21:12			21:53
13	08:36	07:49	06:46			06:31		19:48 (WEA06)	05:28			04:54
	16:30	17:29	18:23			20:20	5	19:53 (WEA06)	21:14			21:54
14	08:35	07:47	06:44			06:29		19:45 (WEA06)	05:26			04:54
	16:32	17:31	18:25			20:22	10	19:55 (WEA06)	21:16			21:55
15	08:34	07:45	06:41			06:26		19:42 (WEA06)	05:25			04:54
	16:33	17:33	18:27			20:24	14	19:56 (WEA06)	21:18			21:55
16	08:33	07:43	06:39			06:24		19:41 (WEA06)	05:23			04:54
	16:35	17:35	18:29			20:26	17	19:58 (WEA06)	21:19			21:56
17	08:32	07:41	06:36			06:22		19:40 (WEA06)	05:21			04:54
	16:37	17:37	18:30			20:27	20	20:00 (WEA06)	21:21			21:56
18	08:31	07:39	06:34			06:19		19:39 (WEA06)	05:20			04:54
	16:39	17:39	18:32			20:29	23	20:02 (WEA06)	21:22			21:57
19	08:30	07:37	06:31			06:17		19:38 (WEA06)	05:18			04:54
	16:40	17:41	18:34			20:31	25	20:03 (WEA06)	21:24			21:57
20	08:29	07:34	06:29			06:15		19:37 (WEA06)	05:17			04:54
	16:42	17:43	18:36			20:33	27	20:04 (WEA06)	21:26			21:58
21	08:27	07:32	06:27			06:13		19:37 (WEA06)	05:15			04:54
	16:44	17:44	18:38			20:35	29	20:06 (WEA06)	21:27			21:58
22	08:26	07:30	06:24		18:10 (WEA05)	06:10		19:37 (WEA06)	05:14			04:54
	16:46	17:46	18:40	4	18:14 (WEA05)	20:37	30	20:07 (WEA06)	21:29			21:58
23	08:25	07:28	06:22		18:08 (WEA05)	06:08		19:36 (WEA06)	05:12			04:54
	16:48	17:48	18:42	7	18:15 (WEA05)	20:38	31	20:07 (WEA06)	21:30			21:58
24	08:24	07:26	06:19		18:07 (WEA05)	06:06		19:36 (WEA06)	05:11			04:54
	16:49	17:50	18:43	10	18:17 (WEA05)	20:40	31	20:07 (WEA06)	21:32			21:58
25	08:22	07:23	06:17		18:05 (WEA05)	06:04		19:37 (WEA06)	05:10			04:55
	16:51	17:52	18:45	14	18:19 (WEA05)	20:42	30	20:07 (WEA06)	21:33			21:58
26	08:21	07:21	06:14		18:05 (WEA05)	06:02		19:36 (WEA06)	05:08			04:55
	16:53	17:54	18:47	16	18:21 (WEA05)	20:44	29	20:05 (WEA06)	21:35			21:58
27	08:19	07:19	06:12		18:04 (WEA05)	05:59		19:36 (WEA06)	05:07			04:56
	16:55	17:56	18:49	18	18:22 (WEA05)	20:46	29	20:05 (WEA06)	21:36			21:58
28	08:18	07:17	06:09		18:04 (WEA05)	05:57		19:37 (WEA06)	05:06			04:56
	16:57	17:58	18:51	20	18:24 (WEA05)	20:48	27	20:04 (WEA06)	21:37			21:58
29	08:16		07:07		19:03 (WEA05)	05:55		19:37 (WEA06)	05:05			04:57
	16:59		19:53	23	19:26 (WEA05)	20:49	26	20:03 (WEA06)	21:39			21:58
30	08:15		07:05		19:04 (WEA05)	05:53		19:38 (WEA06)	05:04			04:57
	17:01		19:54	22	19:26 (WEA05)	20:51	24	20:02 (WEA06)	21:40			21:58
31	08:13		07:02		19:05 (WEA05)				05:03			
	17:03		19:56	21	19:26 (WEA05)				21:41			
Sonnenscheinstunden	251	274	367			420			493			509
astr.max.mögl.Beschattung				155			481			68		
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43		
Reduktion Betriebsdauer				0,95			0,95			0,95		
Reduktion Windrichtung				0,65			0,62			0,62		
Gesamte Reduktion				0,17			0,22			0,25		
Met.wahrsch.Beschattung				27			106			17		

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP17 - An der Gösche 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August		September		Oktober	November	Dezember
1	04:58	05:38		06:31		07:24	07:22	08:17
	21:57	21:22		20:16		19:03	16:53	16:09
2	04:59	05:39		06:33		07:26	07:24	08:18
	21:57	21:21		20:14		19:01	16:51	16:08
3	05:00	05:41		06:35		07:28	07:26	08:20
	21:56	21:19		20:12		18:58	16:49	16:08
4	05:00	05:43		06:37		07:30	07:28	08:21
	21:56	21:17		20:09		18:56	16:47	16:07
5	05:01	05:44		06:38		07:31	07:30	08:22
	21:55	21:15		20:07		18:53	16:45	16:06
6	05:02	05:46		06:40		07:33	07:32	08:24
	21:55	21:13		20:04		18:51	16:43	16:06
7	05:03	05:48		06:42		07:35	07:34	08:25
	21:54	21:11		20:02		18:49	16:41	16:05
8	05:04	05:49	19:57 (WEA06)	06:44	19:06 (WEA05)	07:37	07:35	08:26
	21:54	21:09	5 20:02 (WEA06)	19:59	4 19:10 (WEA05)	18:46	16:40	16:05
9	05:05	05:51	19:53 (WEA06)	06:45	19:02 (WEA05)	07:39	07:37	08:28
	21:53	21:07	13 20:06 (WEA06)	19:57	12 19:14 (WEA05)	18:44	16:38	16:05
10	05:06	05:53	19:50 (WEA06)	06:47	19:00 (WEA05)	07:40	07:39	08:29
	21:52	21:05	18 20:08 (WEA06)	19:55	16 19:16 (WEA05)	18:41	16:36	16:04
11	05:07	05:55	19:49 (WEA06)	06:49	18:57 (WEA05)	07:42	07:41	08:30
	21:51	21:03	20 20:09 (WEA06)	19:52	19 19:16 (WEA05)	18:39	16:34	16:04
12	05:08	05:56	19:47 (WEA06)	06:51	18:56 (WEA05)	07:44	07:43	08:31
	21:50	21:01	23 20:10 (WEA06)	19:50	21 19:17 (WEA05)	18:37	16:33	16:04
13	05:10	05:58	19:46 (WEA06)	06:52	18:55 (WEA05)	07:46	07:45	08:32
	21:49	20:59	25 20:11 (WEA06)	19:47	22 19:17 (WEA05)	18:34	16:31	16:04
14	05:11	06:00	19:45 (WEA06)	06:54	18:55 (WEA05)	07:48	07:47	08:33
	21:48	20:57	27 20:12 (WEA06)	19:45	22 19:17 (WEA05)	18:32	16:30	16:04
15	05:12	06:01	19:44 (WEA06)	06:56	18:53 (WEA05)	07:50	07:49	08:34
	21:47	20:55	28 20:12 (WEA06)	19:42	21 19:14 (WEA05)	18:30	16:28	16:04
16	05:13	06:03	19:44 (WEA06)	06:58	18:53 (WEA05)	07:52	07:51	08:35
	21:46	20:53	29 20:13 (WEA06)	19:40	19 19:12 (WEA05)	18:27	16:26	16:04
17	05:15	06:05	19:43 (WEA06)	06:59	18:53 (WEA05)	07:53	07:52	08:36
	21:45	20:51	30 20:13 (WEA06)	19:37	17 19:10 (WEA05)	18:25	16:25	16:04
18	05:16	06:07	19:42 (WEA06)	07:01	18:53 (WEA05)	07:55	07:54	08:37
	21:44	20:48	31 20:13 (WEA06)	19:35	14 19:07 (WEA05)	18:23	16:24	16:04
19	05:17	06:08	19:42 (WEA06)	07:03	18:53 (WEA05)	07:57	07:56	08:37
	21:42	20:46	31 20:13 (WEA06)	19:32	11 19:04 (WEA05)	18:21	16:22	16:04
20	05:19	06:10	19:42 (WEA06)	07:05	18:54 (WEA05)	07:59	07:58	08:38
	21:41	20:44	31 20:13 (WEA06)	19:30	8 19:02 (WEA05)	18:18	16:21	16:05
21	05:20	06:12	19:41 (WEA06)	07:06	18:55 (WEA05)	08:01	08:00	08:39
	21:40	20:42	31 20:12 (WEA06)	19:28	5 19:00 (WEA05)	18:16	16:19	16:05
22	05:22	06:14	19:42 (WEA06)	07:08	18:56 (WEA05)	08:03	08:02	08:39
	21:38	20:40	29 20:11 (WEA06)	19:25	1 18:57 (WEA05)	18:14	16:18	16:06
23	05:23	06:15	19:42 (WEA06)	07:10		08:05	08:03	08:40
	21:37	20:37	27 20:09 (WEA06)	19:23		18:12	16:17	16:06
24	05:25	06:17	19:41 (WEA06)	07:12		08:07	08:05	08:40
	21:35	20:35	25 20:06 (WEA06)	19:20		18:10	16:16	16:07
25	05:26	06:19	19:42 (WEA06)	07:13		07:09	08:07	08:40
	21:34	20:33	22 20:04 (WEA06)	19:18		17:07	16:15	16:07
26	05:28	06:21	19:43 (WEA06)	07:15		07:10	08:08	08:41
	21:32	20:30	19 20:02 (WEA06)	19:15		17:05	16:14	16:08
27	05:29	06:23	19:43 (WEA06)	07:17		07:12	08:10	08:41
	21:31	20:28	16 19:59 (WEA06)	19:13		17:03	16:13	16:09
28	05:31	06:24	19:44 (WEA06)	07:19		07:14	08:12	08:41
	21:29	20:26	13 19:57 (WEA06)	19:10		17:01	16:12	16:10
29	05:33	06:26	19:46 (WEA06)	07:21		07:16	08:13	08:41
	21:28	20:23	9 19:55 (WEA06)	19:08		16:59	16:11	16:11
30	05:34	06:28	19:48 (WEA06)	07:22		07:18	08:15	08:41
	21:26	20:21	4 19:52 (WEA06)	19:05		16:57	16:10	16:12
31	05:36	06:30				07:20		08:41
	21:24	20:19				16:55		16:12
Sonnenscheinstunden	511	459		382		329	260	234
astr.max.mögl.Beschattung		506		212				
Red.Sonnenscheinwahrsch.		0,42		0,35				
Reduktion Betriebsdauer		0,95		0,95				
Reduktion Windrichtung		0,62		0,65				
Gesamte Reduktion		0,25		0,22				
Met.wahrsch.Beschattung		126		46				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP18 - Wischhofstraße 17a, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März			April			Mai			Juni		
1	08:41		08:11		07:14			07:00			05:51			05:02		20:26 (WEA06)
	16:14		17:05		18:00			19:58			20:53			21:43	36	21:02 (WEA06)
2	08:41		08:10		07:12			06:57			05:49			05:01		20:26 (WEA06)
	16:15		17:07		18:02			20:00			20:55			21:44	36	21:02 (WEA06)
3	08:41		08:08		07:10			06:55			05:47			05:00		20:26 (WEA06)
	16:16		17:09		18:04			20:02			20:57			21:45	36	21:02 (WEA06)
4	08:41		08:06		07:07			06:52			05:45			04:59		20:26 (WEA06)
	16:17		17:11		18:06			20:04			20:58			21:46	36	21:02 (WEA06)
5	08:40		08:04		07:05			06:50			05:43			04:59		20:27 (WEA06)
	16:19		17:13		18:08			20:05			21:00			21:47	36	21:03 (WEA06)
6	08:40		08:03		07:03			06:48			05:41			04:58		20:27 (WEA06)
	16:20		17:15		18:10			20:07			21:02			21:48	36	21:03 (WEA06)
7	08:40		08:01		07:00			06:45		19:39 (WEA05)	05:39			04:57		20:27 (WEA06)
	16:21		17:17		18:12			20:09	3	19:42 (WEA05)	21:04			21:49	35	21:02 (WEA06)
8	08:39		07:59		06:58			06:43		19:36 (WEA05)	05:37			04:57		20:27 (WEA06)
	16:23		17:19		18:14			20:11	7	19:43 (WEA05)	21:05			21:50	36	21:03 (WEA06)
9	08:38		07:57		06:56			06:40		19:35 (WEA05)	05:35			04:56		20:28 (WEA06)
	16:24		17:21		18:15			20:13	10	19:45 (WEA05)	21:07			21:51	36	21:04 (WEA06)
10	08:38		07:55		06:53			06:38		19:33 (WEA05)	05:33			04:55		20:28 (WEA06)
	16:26		17:23		18:17			20:15	15	19:48 (WEA05)	21:09			21:52	35	21:03 (WEA06)
11	08:37		07:53		06:51		17:52 (WEA09)	06:36		19:32 (WEA05)	05:32			04:55		20:28 (WEA06)
	16:27		17:25		18:19	1	17:53 (WEA09)	20:16	17	19:49 (WEA05)	21:11			21:53	35	21:03 (WEA06)
12	08:36		07:51		06:48		17:49 (WEA09)	06:33		19:31 (WEA05)	05:30		20:39 (WEA06)	04:55		20:29 (WEA06)
	16:29		17:27		18:21	5	17:54 (WEA09)	20:18	20	19:51 (WEA05)	21:12	2	20:41 (WEA06)	21:53	35	21:04 (WEA06)
13	08:36		07:49		06:46		17:48 (WEA09)	06:31		19:31 (WEA05)	05:28		20:35 (WEA06)	04:54		20:28 (WEA06)
	16:30		17:29		18:23	9	17:57 (WEA09)	20:20	22	19:53 (WEA05)	21:14	7	20:42 (WEA06)	21:54	35	21:03 (WEA06)
14	08:35		07:47		06:44		17:46 (WEA09)	06:29		19:30 (WEA05)	05:26		20:34 (WEA06)	04:54		20:29 (WEA06)
	16:32		17:31		18:25	12	17:58 (WEA09)	20:22	25	19:55 (WEA05)	21:16	10	20:44 (WEA06)	21:55	35	21:04 (WEA06)
15	08:34		07:45		06:41		17:46 (WEA09)	06:26		19:29 (WEA05)	05:25		20:32 (WEA06)	04:54		20:29 (WEA06)
	16:33		17:33		18:27	14	18:00 (WEA09)	20:24	27	19:56 (WEA05)	21:18	14	20:46 (WEA06)	21:55	35	21:04 (WEA06)
16	08:33		07:43		06:39		17:45 (WEA09)	06:24		19:29 (WEA05)	05:23		20:31 (WEA06)	04:54		20:29 (WEA06)
	16:35		17:35		18:29	17	18:02 (WEA09)	20:26	28	19:57 (WEA05)	21:19	17	20:48 (WEA06)	21:56	35	21:04 (WEA06)
17	08:32		07:41		06:36		17:45 (WEA09)	06:22		19:30 (WEA05)	05:21		20:29 (WEA06)	04:54		20:30 (WEA06)
	16:37		17:37		18:30	19	18:04 (WEA09)	20:27	26	19:56 (WEA05)	21:21	19	20:48 (WEA06)	21:56	34	21:04 (WEA06)
18	08:31		07:39		06:34		17:44 (WEA09)	06:19		19:30 (WEA05)	05:20		20:29 (WEA06)	04:54		20:30 (WEA06)
	16:39		17:39		18:32	21	18:05 (WEA09)	20:29	26	19:56 (WEA05)	21:22	21	20:50 (WEA06)	21:57	34	21:04 (WEA06)
19	08:30		07:37		06:31		17:44 (WEA09)	06:17		19:30 (WEA05)	05:18		20:28 (WEA06)	04:54		20:30 (WEA06)
	16:40		17:41		18:34	23	18:07 (WEA09)	20:31	24	19:54 (WEA05)	21:24	23	20:51 (WEA06)	21:57	35	21:05 (WEA06)
20	08:29		07:34		06:29		17:45 (WEA09)	06:15		19:30 (WEA05)	05:17		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:42		17:43		18:36	22	18:07 (WEA09)	20:33	24	19:54 (WEA05)	21:26	26	20:53 (WEA06)	21:58	35	21:05 (WEA06)
21	08:27		07:32		06:27		17:45 (WEA09)	06:13		19:31 (WEA05)	05:15		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:44		17:44		18:38	20	18:05 (WEA09)	20:35	22	19:53 (WEA05)	21:27	28	20:55 (WEA06)	21:58	35	21:05 (WEA06)
22	08:26		07:30		06:24		17:46 (WEA09)	06:10		19:32 (WEA05)	05:14		20:27 (WEA06)	04:54		20:31 (WEA06)
	16:46		17:46		18:40	18	18:04 (WEA09)	20:37	19	19:51 (WEA05)	21:29	29	20:56 (WEA06)	21:58	35	21:06 (WEA06)
23	08:25		07:28		06:22		17:47 (WEA09)	06:08		19:34 (WEA05)	05:12		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:48		17:48		18:42	15	18:02 (WEA09)	20:38	16	19:50 (WEA05)	21:30	31	20:57 (WEA06)	21:58	35	21:06 (WEA06)
24	08:24		07:26		06:19		17:50 (WEA09)	06:06		19:36 (WEA05)	05:11		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:49		17:50		18:43	9	17:59 (WEA09)	20:40	11	19:47 (WEA05)	21:32	32	20:58 (WEA06)	21:58	35	21:06 (WEA06)
25	08:22		07:23		06:17			06:04			05:10		20:26 (WEA06)	04:55		20:32 (WEA06)
	16:51		17:52		18:45			20:42			21:33	34	21:00 (WEA06)	21:58	34	21:06 (WEA06)
26	08:21		07:21		06:14			06:02			05:09		20:26 (WEA06)	04:55		20:32 (WEA06)
	16:53		17:54		18:47			20:44			21:35	35	21:01 (WEA06)	21:58	34	21:06 (WEA06)
27	08:19		07:19		06:12			05:59			05:07		20:26 (WEA06)	04:56		20:32 (WEA06)
	16:55		17:56		18:49			20:46			21:36	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
28	08:18		07:17		06:09			05:57			05:06		20:26 (WEA06)	04:56		20:32 (WEA06)
	16:57		17:58		18:51			20:48			21:37	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
29	08:16				07:07			05:55			05:05		20:26 (WEA06)	04:57		20:32 (WEA06)
	16:59				19:53			20:49			21:39	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
30	08:15				07:05			05:53			05:04		20:26 (WEA06)	04:57		20:32 (WEA06)
	17:01				19:54			20:51			21:40	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
31	08:13				07:02						05:03		20:26 (WEA06)			
	17:03				19:56						21:41	36	21:02 (WEA06)			
Sonnenscheinstunden	251		274		367			420			493			509		
astr.max.mögl.Beschattung						205			342			504			1054	
Red.Sonnenscheinwahrsch.						0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,65			0,63			0,62			0,62	
Gesamte Reduktion						0,17			0,22			0,25			0,23	
Met.wahrsch.Beschattung						35			76			127			240	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP18 - Wischhofstraße 17a, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober			November	Dezember
1	04:58		20:32 (WEA06)	05:38			06:31		19:32 (WEA05)	07:24		18:27 (WEA09)	07:22	08:17
	21:57	36	21:08 (WEA06)	21:22			20:16	16	19:48 (WEA05)	19:03	7	18:34 (WEA09)	16:53	16:09
2	04:59		20:33 (WEA06)	05:39			06:33		19:31 (WEA05)	07:26		18:29 (WEA09)	07:24	08:18
	21:57	35	21:08 (WEA06)	21:21			20:14	14	19:45 (WEA05)	19:01	3	18:32 (WEA09)	16:51	16:08
3	05:00		20:32 (WEA06)	05:41			06:35		19:33 (WEA05)	07:28			07:26	08:20
	21:56	36	21:08 (WEA06)	21:19			20:12	10	19:43 (WEA05)	18:58			16:49	16:08
4	05:00		20:33 (WEA06)	05:43			06:37		19:34 (WEA05)	07:30			07:28	08:21
	21:56	35	21:08 (WEA06)	21:17			20:09	7	19:41 (WEA05)	18:56			16:47	16:07
5	05:01		20:33 (WEA06)	05:44			06:38		19:35 (WEA05)	07:31			07:30	08:22
	21:55	36	21:09 (WEA06)	21:15			20:07	3	19:38 (WEA05)	18:53			16:45	16:06
6	05:02		20:33 (WEA06)	05:46			06:40			07:33			07:32	08:24
	21:55	36	21:09 (WEA06)	21:13			20:04			18:51			16:43	16:06
7	05:03		20:33 (WEA06)	05:48			06:42			07:35			07:34	08:25
	21:54	36	21:09 (WEA06)	21:11			20:02			18:49			16:41	16:05
8	05:04		20:34 (WEA06)	05:49			06:44			07:37			07:35	08:26
	21:54	36	21:10 (WEA06)	21:09			19:59			18:46			16:40	16:05
9	05:05		20:34 (WEA06)	05:51			06:45			07:39			07:37	08:28
	21:53	36	21:10 (WEA06)	21:07			19:57			18:44			16:38	16:05
10	05:06		20:34 (WEA06)	05:53			06:47			07:40			07:39	08:29
	21:52	36	21:10 (WEA06)	21:05			19:55			18:41			16:36	16:04
11	05:07		20:34 (WEA06)	05:55			06:49			07:42			07:41	08:30
	21:51	36	21:10 (WEA06)	21:03			19:52			18:39			16:34	16:04
12	05:08		20:34 (WEA06)	05:56			06:51			07:44			07:43	08:31
	21:50	36	21:10 (WEA06)	21:01			19:50			18:37			16:33	16:04
13	05:10		20:34 (WEA06)	05:58			06:52			07:46			07:45	08:32
	21:49	36	21:10 (WEA06)	20:59			19:47			18:34			16:31	16:04
14	05:11		20:34 (WEA06)	06:00			06:54			07:48			07:47	08:33
	21:48	36	21:10 (WEA06)	20:57			19:45			18:32			16:30	16:04
15	05:12		20:34 (WEA06)	06:01			06:56			07:50			07:49	08:34
	21:47	36	21:10 (WEA06)	20:55			19:42			18:30			16:28	16:04
16	05:13		20:34 (WEA06)	06:03			06:58			07:52			07:51	08:35
	21:46	35	21:09 (WEA06)	20:53			19:40			18:27			16:26	16:04
17	05:15		20:35 (WEA06)	06:05			06:59			07:53			07:52	08:36
	21:45	35	21:10 (WEA06)	20:51			19:37			18:25			16:25	16:04
18	05:16		20:35 (WEA06)	06:07		19:47 (WEA05)	07:01			07:55			07:54	08:37
	21:44	35	21:10 (WEA06)	20:48	1	19:48 (WEA05)	19:35			18:23			16:24	16:04
19	05:18		20:35 (WEA06)	06:08		19:41 (WEA05)	07:03		18:37 (WEA09)	07:57			07:56	08:37
	21:42	34	21:09 (WEA06)	20:46	12	19:53 (WEA05)	19:32	8	18:45 (WEA09)	18:21			16:22	16:04
20	05:19		20:36 (WEA06)	06:10		19:39 (WEA05)	07:05		18:34 (WEA09)	07:59			07:58	08:38
	21:41	32	21:08 (WEA06)	20:44	17	19:56 (WEA05)	19:30	14	18:48 (WEA09)	18:18			16:21	16:05
21	05:20		20:37 (WEA06)	06:12		19:37 (WEA05)	07:06		18:32 (WEA09)	08:01			08:00	08:39
	21:40	30	21:07 (WEA06)	20:42	19	19:56 (WEA05)	19:28	17	18:49 (WEA09)	18:16			16:19	16:05
22	05:22		20:37 (WEA06)	06:14		19:36 (WEA05)	07:08		18:30 (WEA09)	08:03			08:02	08:39
	21:38	28	21:05 (WEA06)	20:40	21	19:57 (WEA05)	19:25	19	18:49 (WEA09)	18:14			16:18	16:06
23	05:23		20:38 (WEA06)	06:16		19:35 (WEA05)	07:10		18:29 (WEA09)	08:05			08:03	08:40
	21:37	26	21:04 (WEA06)	20:37	23	19:58 (WEA05)	19:23	21	18:50 (WEA09)	18:12			16:17	16:06
24	05:25		20:38 (WEA06)	06:17		19:33 (WEA05)	07:12		18:28 (WEA09)	08:07			08:05	08:40
	21:35	25	21:03 (WEA06)	20:35	25	19:58 (WEA05)	19:20	23	18:51 (WEA09)	18:10			16:16	16:07
25	05:26		20:39 (WEA06)	06:19		19:33 (WEA05)	07:13		18:28 (WEA09)	07:09			08:07	08:40
	21:34	23	21:02 (WEA06)	20:33	26	19:59 (WEA05)	19:18	22	18:50 (WEA09)	17:07			16:15	16:07
26	05:28		20:40 (WEA06)	06:21		19:32 (WEA05)	07:15		18:26 (WEA09)	07:10			08:08	08:41
	21:32	20	21:00 (WEA06)	20:30	27	19:59 (WEA05)	19:15	21	18:47 (WEA09)	17:05			16:14	16:08
27	05:29		20:40 (WEA06)	06:23		19:31 (WEA05)	07:17		18:26 (WEA09)	07:12			08:10	08:41
	21:31	18	20:58 (WEA06)	20:28	27	19:58 (WEA05)	19:13	18	18:44 (WEA09)	17:03			16:13	16:09
28	05:31		20:42 (WEA06)	06:24		19:31 (WEA05)	07:19		18:26 (WEA09)	07:14			08:12	08:41
	21:29	15	20:57 (WEA06)	20:26	26	19:57 (WEA05)	19:10	16	18:42 (WEA09)	17:01			16:12	16:10
29	05:33		20:43 (WEA06)	06:26		19:31 (WEA05)	07:21		18:27 (WEA09)	07:16			08:13	08:41
	21:28	12	20:55 (WEA06)	20:23	24	19:55 (WEA05)	19:08	13	18:40 (WEA09)	16:59			16:11	16:11
30	05:34		20:45 (WEA06)	06:28		19:31 (WEA05)	07:22		18:27 (WEA09)	07:18			08:15	08:41
	21:26	9	20:54 (WEA06)	20:21	21	19:52 (WEA05)	19:05	10	18:37 (WEA09)	16:57			16:10	16:12
31	05:36		20:47 (WEA06)	06:30		19:31 (WEA05)				07:20				08:41
	21:24	5	20:52 (WEA06)	20:19	19	19:50 (WEA05)				16:55				16:13
Sonnenscheinstunden	511			459			382			329			260	234
astr.max.mögl.Beschattung		920			288			252			10			
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35			0,29			
Reduktion Betriebsdauer		0,95			0,95			0,95			0,95			
Reduktion Windrichtung		0,62			0,63			0,65			0,65			
Gesamte Reduktion		0,22			0,25			0,21			0,18			
Met.wahrsch.Beschattung		205			73			54			2			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP19 - Wischhofstraße 15, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51			05:02		20:25 (WEA06)
	16:14	17:05	18:00	19:58			20:53			21:43	33	20:58 (WEA06)
2	08:41	08:10	07:12	06:57			05:49			05:01		20:26 (WEA06)
	16:15	17:07	18:02	20:00			20:55			21:44	33	20:59 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:26 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	33	20:59 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:26 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	32	20:58 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:27 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	32	20:59 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:27 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	32	20:59 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:26 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	32	20:58 (WEA06)
8	08:39	07:59	06:58	06:43		19:38 (WEA05)	05:37			04:57		20:27 (WEA06)
	16:23	17:19	18:14	20:11	5	19:43 (WEA05)	21:05			21:50	32	20:59 (WEA06)
9	08:38	07:57	06:56	06:40		19:37 (WEA05)	05:35			04:56		20:28 (WEA06)
	16:24	17:21	18:15	20:13	8	19:45 (WEA05)	21:07			21:51	31	20:59 (WEA06)
10	08:38	07:55	06:53	06:38		19:36 (WEA05)	05:33		20:37 (WEA06)	04:55		20:28 (WEA06)
	16:26	17:23	18:17	20:15	12	19:48 (WEA05)	21:09	1	20:38 (WEA06)	21:52	31	20:59 (WEA06)
11	08:37	07:53	06:51	06:36		19:34 (WEA05)	05:32		20:34 (WEA06)	04:55		20:28 (WEA06)
	16:27	17:25	18:19	20:16	15	19:49 (WEA05)	21:11	6	20:40 (WEA06)	21:53	31	20:59 (WEA06)
12	08:36	07:51	06:48	06:33		19:33 (WEA05)	05:30		20:32 (WEA06)	04:55		20:29 (WEA06)
	16:29	17:27	18:21	20:18	18	19:51 (WEA05)	21:12	9	20:41 (WEA06)	21:53	30	20:59 (WEA06)
13	08:36	07:49	06:46	06:31		19:33 (WEA05)	05:28		20:30 (WEA06)	04:54		20:29 (WEA06)
	16:30	17:29	18:23	20:20	20	19:53 (WEA05)	21:14	12	20:42 (WEA06)	21:54	30	20:59 (WEA06)
14	08:35	07:47	06:44	06:29		19:33 (WEA05)	05:26		20:29 (WEA06)	04:54		20:29 (WEA06)
	16:32	17:31	18:25	20:22	22	19:55 (WEA05)	21:16	15	20:44 (WEA06)	21:55	30	20:59 (WEA06)
15	08:34	07:45	06:41	06:26		19:31 (WEA05)	05:25		20:28 (WEA06)	04:54		20:29 (WEA06)
	16:33	17:33	18:27	20:24	25	19:56 (WEA05)	21:18	18	20:46 (WEA06)	21:55	30	20:59 (WEA06)
16	08:33	07:43	06:39	06:24		19:32 (WEA05)	05:23		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:35	17:35	18:29	20:26	25	19:57 (WEA05)	21:19	21	20:48 (WEA06)	21:56	29	20:59 (WEA06)
17	08:32	07:41	06:36	06:22		19:32 (WEA05)	05:21		20:26 (WEA06)	04:54		20:30 (WEA06)
	16:37	17:37	18:30	20:27	25	19:57 (WEA05)	21:21	22	20:48 (WEA06)	21:56	30	21:00 (WEA06)
18	08:31	07:39	06:34	06:19		19:32 (WEA05)	05:20		20:26 (WEA06)	04:54		20:30 (WEA06)
	16:39	17:39	18:32	20:29	25	19:57 (WEA05)	21:22	24	20:50 (WEA06)	21:57	30	21:00 (WEA06)
19	08:30	07:37	06:31	06:17		19:32 (WEA05)	05:18		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:40	17:41	18:34	20:31	23	19:55 (WEA05)	21:24	26	20:51 (WEA06)	21:57	29	21:00 (WEA06)
20	08:29	07:34	06:29	06:15		19:33 (WEA05)	05:17		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:42	17:43	18:36	20:33	21	19:54 (WEA05)	21:26	28	20:53 (WEA06)	21:58	29	21:00 (WEA06)
21	08:27	07:32	06:27	06:13		19:34 (WEA05)	05:15		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:44	17:44	18:38	20:35	19	19:53 (WEA05)	21:27	30	20:55 (WEA06)	21:58	29	21:00 (WEA06)
22	08:26	07:30	06:24	06:10		19:35 (WEA05)	05:14		20:25 (WEA06)	04:54		20:32 (WEA06)
	16:46	17:46	18:40	20:37	17	19:52 (WEA05)	21:29	31	20:56 (WEA06)	21:58	29	21:01 (WEA06)
23	08:25	07:28	06:22	06:08		19:37 (WEA05)	05:12		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:48	17:48	18:42	20:38	13	19:50 (WEA05)	21:30	33	20:57 (WEA06)	21:58	29	21:01 (WEA06)
24	08:24	07:26	06:19	06:06		19:40 (WEA05)	05:11		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:49	17:50	18:43	20:40	6	19:46 (WEA05)	21:32	33	20:57 (WEA06)	21:58	29	21:01 (WEA06)
25	08:22	07:23	06:17	06:04			05:10		20:24 (WEA06)	04:55		20:32 (WEA06)
	16:51	17:52	18:45	20:42			21:33	34	20:58 (WEA06)	21:58	30	21:02 (WEA06)
26	08:21	07:21	06:14	06:02			05:09		20:24 (WEA06)	04:55		20:32 (WEA06)
	16:53	17:54	18:47	20:44			21:35	34	20:58 (WEA06)	21:58	29	21:01 (WEA06)
27	08:19	07:19	06:12	05:59			05:07		20:24 (WEA06)	04:56		20:33 (WEA06)
	16:55	17:56	18:49	20:46			21:36	34	20:58 (WEA06)	21:58	29	21:02 (WEA06)
28	08:18	07:17	06:09	05:57			05:06		20:24 (WEA06)	04:56		20:32 (WEA06)
	16:57	17:58	18:51	20:48			21:37	34	20:58 (WEA06)	21:58	30	21:02 (WEA06)
29	08:16		07:07	05:55			05:05		20:25 (WEA06)	04:57		20:33 (WEA06)
	16:59		19:53	20:49			21:39	33	20:58 (WEA06)	21:58	30	21:03 (WEA06)
30	08:15		07:05	05:53			05:04		20:25 (WEA06)	04:57		20:32 (WEA06)
	17:01		19:54	20:51			21:40	33	20:58 (WEA06)	21:58	31	21:03 (WEA06)
31	08:13		07:02				05:03		20:25 (WEA06)			
	17:03		19:56				21:41	33	20:58 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					299			544			914	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,63			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					67			138			208	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP19 - Wischhofstraße 15, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		20:33 (WEA06)	05:38		20:43 (WEA06)	06:31	19:34 (WEA05)	07:24	07:22	08:17
	21:57	30	21:03 (WEA06)	21:22	8	20:51 (WEA06)	20:16	14	19:48 (WEA05)	19:03	16:53	16:09
2	04:59		20:33 (WEA06)	05:39		20:44 (WEA06)	06:33		19:34 (WEA05)	07:26	07:24	08:18
	21:57	31	21:04 (WEA06)	21:21	5	20:49 (WEA06)	20:14	11	19:45 (WEA05)	19:01	16:51	16:08
3	05:00		20:32 (WEA06)	05:41			06:35		19:35 (WEA05)	07:28	07:26	08:20
	21:56	31	21:03 (WEA06)	21:19			20:12	8	19:43 (WEA05)	18:58	16:49	16:08
4	05:00		20:33 (WEA06)	05:43			06:37		19:36 (WEA05)	07:30	07:28	08:21
	21:56	31	21:04 (WEA06)	21:17			20:09	5	19:41 (WEA05)	18:56	16:47	16:07
5	05:01		20:33 (WEA06)	05:44			06:38			07:31	07:30	08:22
	21:55	32	21:05 (WEA06)	21:15			20:07			18:53	16:45	16:06
6	05:02		20:33 (WEA06)	05:46			06:40			07:33	07:32	08:24
	21:55	32	21:05 (WEA06)	21:13			20:04			18:51	16:43	16:06
7	05:03		20:33 (WEA06)	05:48			06:42			07:35	07:34	08:25
	21:54	32	21:05 (WEA06)	21:11			20:02			18:49	16:41	16:05
8	05:04		20:33 (WEA06)	05:49			06:44			07:37	07:35	08:26
	21:54	33	21:06 (WEA06)	21:09			19:59			18:46	16:40	16:05
9	05:05		20:33 (WEA06)	05:51			06:45			07:39	07:37	08:28
	21:53	33	21:06 (WEA06)	21:07			19:57			18:44	16:38	16:05
10	05:06		20:33 (WEA06)	05:53			06:47			07:40	07:39	08:29
	21:52	33	21:06 (WEA06)	21:05			19:55			18:41	16:36	16:04
11	05:07		20:33 (WEA06)	05:55			06:49			07:42	07:41	08:30
	21:51	33	21:06 (WEA06)	21:03			19:52			18:39	16:34	16:04
12	05:08		20:33 (WEA06)	05:56			06:51			07:44	07:43	08:31
	21:50	34	21:07 (WEA06)	21:01			19:50			18:37	16:33	16:04
13	05:10		20:33 (WEA06)	05:58			06:52			07:46	07:45	08:32
	21:49	34	21:07 (WEA06)	20:59			19:47			18:34	16:31	16:04
14	05:11		20:33 (WEA06)	06:00			06:54			07:48	07:47	08:33
	21:48	34	21:07 (WEA06)	20:57			19:45			18:32	16:30	16:04
15	05:12		20:33 (WEA06)	06:01			06:56			07:50	07:49	08:34
	21:47	34	21:07 (WEA06)	20:55			19:42			18:30	16:28	16:04
16	05:13		20:33 (WEA06)	06:03			06:58			07:52	07:51	08:35
	21:46	34	21:07 (WEA06)	20:53			19:40			18:27	16:26	16:04
17	05:15		20:34 (WEA06)	06:05			06:59			07:53	07:52	08:36
	21:45	33	21:07 (WEA06)	20:51			19:37			18:25	16:25	16:04
18	05:16		20:34 (WEA06)	06:07			07:01			07:55	07:54	08:37
	21:44	33	21:07 (WEA06)	20:48			19:35			18:23	16:24	16:04
19	05:18		20:34 (WEA06)	06:08		19:45 (WEA05)	07:03			07:57	07:56	08:37
	21:42	33	21:07 (WEA06)	20:46	8	19:53 (WEA05)	19:32			18:21	16:22	16:04
20	05:19		20:34 (WEA06)	06:10		19:42 (WEA05)	07:05			07:59	07:58	08:38
	21:41	34	21:08 (WEA06)	20:44	14	19:56 (WEA05)	19:30			18:18	16:21	16:05
21	05:20		20:34 (WEA06)	06:12		19:39 (WEA05)	07:06			08:01	08:00	08:39
	21:40	33	21:07 (WEA06)	20:42	18	19:57 (WEA05)	19:28			18:16	16:19	16:05
22	05:22		20:34 (WEA06)	06:14		19:38 (WEA05)	07:08			08:03	08:02	08:39
	21:38	31	21:05 (WEA06)	20:40	20	19:58 (WEA05)	19:25			18:14	16:18	16:06
23	05:23		20:35 (WEA06)	06:16		19:37 (WEA05)	07:10			08:05	08:03	08:40
	21:37	29	21:04 (WEA06)	20:37	22	19:59 (WEA05)	19:23			18:12	16:17	16:06
24	05:25		20:35 (WEA06)	06:17		19:35 (WEA05)	07:12			08:07	08:05	08:40
	21:35	28	21:03 (WEA06)	20:35	24	19:59 (WEA05)	19:20			18:10	16:16	16:07
25	05:26		20:36 (WEA06)	06:19		19:35 (WEA05)	07:13			07:09	08:07	08:40
	21:34	26	21:02 (WEA06)	20:33	24	19:59 (WEA05)	19:18			17:07	16:15	16:07
26	05:28		20:36 (WEA06)	06:21		19:35 (WEA05)	07:15			07:10	08:08	08:41
	21:32	24	21:00 (WEA06)	20:30	25	20:00 (WEA05)	19:15			17:05	16:14	16:08
27	05:29		20:37 (WEA06)	06:23		19:33 (WEA05)	07:17			07:12	08:10	08:41
	21:31	21	20:58 (WEA06)	20:28	26	19:59 (WEA05)	19:13			17:03	16:13	16:09
28	05:31		20:38 (WEA06)	06:24		19:33 (WEA05)	07:19			07:14	08:12	08:41
	21:29	19	20:57 (WEA06)	20:26	24	19:57 (WEA05)	19:10			17:01	16:12	16:10
29	05:33		20:38 (WEA06)	06:26		19:33 (WEA05)	07:21			07:16	08:13	08:41
	21:28	17	20:55 (WEA06)	20:23	22	19:55 (WEA05)	19:08			16:59	16:11	16:11
30	05:34		20:40 (WEA06)	06:28		19:33 (WEA05)	07:22			07:18	08:15	08:41
	21:26	14	20:54 (WEA06)	20:21	19	19:52 (WEA05)	19:05			16:57	16:10	16:12
31	05:36		20:41 (WEA06)	06:30		19:33 (WEA05)				07:20		08:41
	21:24	11	20:52 (WEA06)	20:19	17	19:50 (WEA05)				16:55		16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		907			276			38				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,62			0,63			0,63				
Gesamte Reduktion		0,22			0,25			0,21				
Met.wahrsch.Beschattung		202			70			8				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP20 - Wischhofstraße 13, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51			05:02		20:25 (WEA06)
	16:14	17:05	18:00	19:58			20:53			21:43	30	20:55 (WEA06)
2	08:41	08:10	07:12	06:57			05:49			05:01		20:26 (WEA06)
	16:15	17:07	18:02	20:00			20:55			21:44	30	20:56 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:26 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	30	20:56 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:26 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	29	20:55 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:27 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	29	20:56 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:27 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	28	20:55 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:27 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	28	20:55 (WEA06)
8	08:39	07:59	06:58	06:43		19:41 (WEA05)	05:37			04:57		20:28 (WEA06)
	16:23	17:19	18:13	20:11	2	19:43 (WEA05)	21:05			21:50	27	20:55 (WEA06)
9	08:38	07:57	06:56	06:40		19:39 (WEA05)	05:35		20:34 (WEA06)	04:56		20:29 (WEA06)
	16:24	17:21	18:15	20:13	6	19:45 (WEA05)	21:07	3	20:37 (WEA06)	21:51	27	20:56 (WEA06)
10	08:38	07:55	06:53	06:38		19:38 (WEA05)	05:33		20:31 (WEA06)	04:55		20:29 (WEA06)
	16:26	17:23	18:17	20:15	10	19:48 (WEA05)	21:09	7	20:38 (WEA06)	21:52	26	20:55 (WEA06)
11	08:37	07:53	06:51	06:36		19:36 (WEA05)	05:32		20:30 (WEA06)	04:55		20:30 (WEA06)
	16:27	17:25	18:19	20:16	13	19:49 (WEA05)	21:11	10	20:40 (WEA06)	21:53	25	20:55 (WEA06)
12	08:36	07:51	06:48	06:33		19:35 (WEA05)	05:30		20:29 (WEA06)	04:55		20:30 (WEA06)
	16:29	17:27	18:21	20:18	16	19:51 (WEA05)	21:12	12	20:41 (WEA06)	21:53	26	20:56 (WEA06)
13	08:36	07:49	06:46	06:31		19:35 (WEA05)	05:28		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:30	17:29	18:23	20:20	18	19:53 (WEA05)	21:14	15	20:42 (WEA06)	21:54	25	20:55 (WEA06)
14	08:35	07:47	06:44	06:29		19:35 (WEA05)	05:26		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:32	17:31	18:25	20:22	20	19:55 (WEA05)	21:16	17	20:44 (WEA06)	21:55	25	20:55 (WEA06)
15	08:34	07:45	06:41	06:26		19:33 (WEA05)	05:25		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:33	17:33	18:27	20:24	23	19:56 (WEA05)	21:17	20	20:46 (WEA06)	21:55	24	20:55 (WEA06)
16	08:33	07:43	06:39	06:24		19:34 (WEA05)	05:23		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:35	17:35	18:29	20:26	24	19:58 (WEA05)	21:19	23	20:48 (WEA06)	21:56	24	20:55 (WEA06)
17	08:32	07:41	06:36	06:22		19:34 (WEA05)	05:21		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:37	17:37	18:30	20:27	24	19:58 (WEA05)	21:21	24	20:48 (WEA06)	21:56	24	20:56 (WEA06)
18	08:31	07:39	06:34	06:19		19:34 (WEA05)	05:20		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:39	17:39	18:32	20:29	24	19:58 (WEA05)	21:22	26	20:50 (WEA06)	21:57	24	20:56 (WEA06)
19	08:30	07:37	06:31	06:17		19:34 (WEA05)	05:18		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:40	17:41	18:34	20:31	22	19:56 (WEA05)	21:24	27	20:51 (WEA06)	21:57	24	20:56 (WEA06)
20	08:29	07:34	06:29	06:15		19:35 (WEA05)	05:17		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:42	17:43	18:36	20:33	20	19:55 (WEA05)	21:26	29	20:53 (WEA06)	21:58	24	20:56 (WEA06)
21	08:27	07:32	06:27	06:13		19:36 (WEA05)	05:15		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:44	17:44	18:38	20:35	18	19:54 (WEA05)	21:27	31	20:55 (WEA06)	21:58	24	20:56 (WEA06)
22	08:26	07:30	06:24	06:10		19:37 (WEA05)	05:14		20:24 (WEA06)	04:54		20:33 (WEA06)
	16:46	17:46	18:40	20:37	15	19:52 (WEA05)	21:29	32	20:56 (WEA06)	21:58	24	20:57 (WEA06)
23	08:25	07:28	06:22	06:08		19:39 (WEA05)	05:12		20:23 (WEA06)	04:54		20:33 (WEA06)
	16:48	17:48	18:42	20:38	11	19:50 (WEA05)	21:30	32	20:55 (WEA06)	21:58	24	20:57 (WEA06)
24	08:24	07:26	06:19	06:06			05:11		20:23 (WEA06)	04:54		20:33 (WEA06)
	16:49	17:50	18:43	20:40			21:32	32	20:55 (WEA06)	21:58	24	20:57 (WEA06)
25	08:22	07:23	06:17	06:04			05:10		20:24 (WEA06)	04:55		20:34 (WEA06)
	16:51	17:52	18:45	20:42			21:33	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
26	08:21	07:21	06:14	06:02			05:09		20:24 (WEA06)	04:55		20:34 (WEA06)
	16:53	17:54	18:47	20:44			21:35	32	20:56 (WEA06)	21:58	23	20:57 (WEA06)
27	08:19	07:19	06:12	05:59			05:07		20:24 (WEA06)	04:56		20:34 (WEA06)
	16:55	17:56	18:49	20:46			21:36	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
28	08:18	07:17	06:09	05:57			05:06		20:24 (WEA06)	04:56		20:34 (WEA06)
	16:57	17:58	18:51	20:48			21:37	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
29	08:16		07:07	05:55			05:05		20:24 (WEA06)	04:57		20:34 (WEA06)
	16:59		19:53	20:49			21:39	32	20:56 (WEA06)	21:58	25	20:59 (WEA06)
30	08:15		07:05	05:53			05:04		20:25 (WEA06)	04:57		20:34 (WEA06)
	17:01		19:54	20:51			21:40	31	20:56 (WEA06)	21:58	25	20:59 (WEA06)
31	08:13		07:02				05:03		20:25 (WEA06)			
	17:03		19:56				21:41	31	20:56 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					266			562			770	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,63			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					59			142			175	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP20 - Wischhofstraße 13, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		20:34 (WEA06) | 05:38		20:39 (WEA06) | 06:31		19:36 (WEA05) | 07:24	07:22	08:17
	21:57	26	21:00 (WEA06) | 21:22	12	20:51 (WEA06) | 20:16	12	19:48 (WEA05) | 19:03	16:53	16:09
2	04:59		20:34 (WEA06) | 05:39		20:40 (WEA06) | 06:33		19:36 (WEA05) | 07:26	07:24	08:18
	21:57	26	21:00 (WEA06) | 21:21	9	20:49 (WEA06) | 20:14	9	19:45 (WEA05) | 19:01	16:51	16:08
3	05:00		20:33 (WEA06) | 05:41		20:43 (WEA06) | 06:35		19:37 (WEA05) | 07:28	07:26	08:20
	21:56	27	21:00 (WEA06) | 21:19	5	20:48 (WEA06) | 20:12	6	19:43 (WEA05) | 18:58	16:49	16:08
4	05:00		20:34 (WEA06) | 05:43		| 06:37		19:39 (WEA05) | 07:30	07:28	08:21
	21:56	27	21:01 (WEA06) | 21:17		| 20:09	2	19:41 (WEA05) | 18:56	16:47	16:07
5	05:01		20:34 (WEA06) | 05:44		| 06:38		| 07:31	07:30	08:22
	21:55	27	21:01 (WEA06) | 21:15		| 20:07		| 18:53	16:45	16:06
6	05:02		20:34 (WEA06) | 05:46		| 06:40		| 07:33	07:32	08:24
	21:55	28	21:02 (WEA06) | 21:13		| 20:04		| 18:51	16:43	16:06
7	05:03		20:34 (WEA06) | 05:48		| 06:42		| 07:35	07:34	08:25
	21:54	28	21:02 (WEA06) | 21:11		| 20:02		| 18:49	16:41	16:05
8	05:04		20:34 (WEA06) | 05:49		| 06:44		| 07:37	07:35	08:26
	21:54	29	21:03 (WEA06) | 21:09		| 19:59		| 18:46	16:40	16:05
9	05:05		20:34 (WEA06) | 05:51		| 06:45		| 07:39	07:37	08:28
	21:53	29	21:03 (WEA06) | 21:07		| 19:57		| 18:44	16:38	16:05
10	05:06		20:34 (WEA06) | 05:53		| 06:47		| 07:40	07:39	08:29
	21:52	29	21:03 (WEA06) | 21:05		| 19:55		| 18:41	16:36	16:04
11	05:07		20:33 (WEA06) | 05:55		| 06:49		| 07:42	07:41	08:30
	21:51	31	21:04 (WEA06) | 21:03		| 19:52		| 18:39	16:34	16:04
12	05:08		20:33 (WEA06) | 05:56		| 06:51		| 07:44	07:43	08:31
	21:50	31	21:04 (WEA06) | 21:01		| 19:50		| 18:37	16:33	16:04
13	05:10		20:33 (WEA06) | 05:58		| 06:52		| 07:46	07:45	08:32
	21:49	31	21:04 (WEA06) | 20:59		| 19:47		| 18:34	16:31	16:04
14	05:11		20:33 (WEA06) | 06:00		| 06:54		| 07:48	07:47	08:33
	21:48	31	21:04 (WEA06) | 20:57		| 19:45		| 18:32	16:30	16:04
15	05:12		20:33 (WEA06) | 06:01		| 06:56		| 07:50	07:49	08:34
	21:47	31	21:04 (WEA06) | 20:55		| 19:42		| 18:30	16:28	16:04
16	05:13		20:33 (WEA06) | 06:03		| 06:58		| 07:52	07:51	08:35
	21:46	31	21:04 (WEA06) | 20:53		| 19:40		| 18:27	16:26	16:04
17	05:15		20:33 (WEA06) | 06:05		| 06:59		| 07:53	07:52	08:36
	21:45	32	21:05 (WEA06) | 20:51		| 19:37		| 18:25	16:25	16:04
18	05:16		20:33 (WEA06) | 06:07		| 07:01		| 07:55	07:54	08:37
	21:44	32	21:05 (WEA06) | 20:48		| 19:35		| 18:23	16:24	16:04
19	05:18		20:33 (WEA06) | 06:08		19:49 (WEA05) | 07:03		| 07:57	07:56	08:37
	21:42	32	21:05 (WEA06) | 20:46	3	19:52 (WEA05) | 19:32		| 18:21	16:22	16:04
20	05:19		20:34 (WEA06) | 06:10		19:45 (WEA05) | 07:05		| 07:59	07:58	08:38
	21:41	32	21:06 (WEA06) | 20:44	11	19:56 (WEA05) | 19:30		| 18:18	16:21	16:05
21	05:20		20:34 (WEA06) | 06:12		19:42 (WEA05) | 07:06		| 08:01	08:00	08:39
	21:40	31	21:05 (WEA06) | 20:42	15	19:57 (WEA05) | 19:28		| 18:16	16:19	16:05
22	05:22		20:33 (WEA06) | 06:14		19:40 (WEA05) | 07:08		| 08:03	08:02	08:39
	21:38	32	21:05 (WEA06) | 20:40	19	19:59 (WEA05) | 19:25		| 18:14	16:18	16:06
23	05:23		20:34 (WEA06) | 06:16		19:39 (WEA05) | 07:10		| 08:05	08:03	08:40
	21:37	30	21:04 (WEA06) | 20:37	21	20:00 (WEA05) | 19:23		| 18:12	16:17	16:06
24	05:25		20:34 (WEA06) | 06:17		19:37 (WEA05) | 07:12		| 08:07	08:05	08:40
	21:35	29	21:03 (WEA06) | 20:35	23	20:00 (WEA05) | 19:20		| 18:10	16:16	16:07
25	05:26		20:34 (WEA06) | 06:19		19:37 (WEA05) | 07:13		| 07:09	08:07	08:40
	21:34	27	21:01 (WEA06) | 20:33	23	20:00 (WEA05) | 19:18		| 17:07	16:15	16:07
26	05:28		20:35 (WEA06) | 06:21		19:37 (WEA05) | 07:15		| 07:10	08:08	08:41
	21:32	25	21:00 (WEA06) | 20:30	24	20:01 (WEA05) | 19:15		| 17:05	16:14	16:08
27	05:29		20:35 (WEA06) | 06:23		19:35 (WEA05) | 07:17		| 07:12	08:10	08:41
	21:31	23	20:58 (WEA06) | 20:28	24	19:59 (WEA05) | 19:13		| 17:03	16:13	16:09
28	05:31		20:36 (WEA06) | 06:24		19:35 (WEA05) | 07:19		| 07:14	08:12	08:41
	21:29	21	20:57 (WEA06) | 20:26	22	19:57 (WEA05) | 19:10		| 17:01	16:12	16:10
29	05:33		20:36 (WEA06) | 06:26		19:35 (WEA05) | 07:21		| 07:16	08:13	08:41
	21:28	19	20:55 (WEA06) | 20:23	20	19:55 (WEA05) | 19:08		| 16:59	16:11	16:11
30	05:34		20:37 (WEA06) | 06:28		19:35 (WEA05) | 07:22		| 07:18	08:15	08:41
	21:26	17	20:54 (WEA06) | 20:21	17	19:52 (WEA05) | 19:05		| 16:57	16:10	16:12
31	05:36		20:38 (WEA06) | 06:30		19:35 (WEA05) |		| 07:20		08:41
	21:24	14	20:52 (WEA06) | 20:19	15	19:50 (WEA05) |		| 16:55		16:13
Sonnenscheinstunden	511		| 459		| 382		| 329	260	234
astr.max.mögl.Beschattung		858	|	263	|	29	|	|	|
Red.Sonnenscheinwahrsch.		0,38	|	0,42	|	0,35	|	|	|
Reduktion Betriebsdauer		0,95	|	0,95	|	0,95	|	|	|
Reduktion Windrichtung		0,62	|	0,63	|	0,63	|	|	|
Gesamte Reduktion		0,22	|	0,25	|	0,21	|	|	|
Met.wahrsch.Beschattung		191	|	67	|	6	|	|	|

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP21 - Auf der Stroth 18, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April		Mai		Juni	
1	08:41	08:11	07:14	07:00		05:51		19:54 (WEA05)	05:02		20:42 (WEA06)
	16:14	17:05	18:00	19:58		20:53	6	20:00 (WEA05)	21:43	26	21:08 (WEA06)
2	08:41	08:10	07:12	06:57		05:49			05:01		20:42 (WEA06)
	16:15	17:07	18:02	20:00		20:55			21:44	28	21:10 (WEA06)
3	08:41	08:08	07:10	06:55		05:47			05:00		20:42 (WEA06)
	16:16	17:09	18:04	20:02		20:57			21:45	29	21:11 (WEA06)
4	08:41	08:06	07:07	06:52		05:45			04:59		20:42 (WEA06)
	16:17	17:11	18:06	20:04		20:58			21:46	29	21:11 (WEA06)
5	08:40	08:04	07:05	06:50		05:43			04:59		20:42 (WEA06)
	16:19	17:13	18:08	20:05		21:00			21:47	31	21:13 (WEA06)
6	08:40	08:03	07:03	06:48		05:41			04:58		20:42 (WEA06)
	16:20	17:15	18:10	20:07		21:02			21:48	31	21:13 (WEA06)
7	08:39	08:01	07:00	06:45		05:39			04:57		20:42 (WEA06)
	16:21	17:17	18:12	20:09		21:04			21:49	31	21:13 (WEA06)
8	08:39	07:59	06:58	06:43		05:37			04:57		20:42 (WEA06)
	16:23	17:19	18:13	20:11		21:05			21:50	31	21:13 (WEA06)
9	08:38	07:57	06:56	06:40		05:35			04:56		20:43 (WEA06)
	16:24	17:21	18:15	20:13		21:07			21:51	31	21:14 (WEA06)
10	08:38	07:55	06:53	06:38		05:33			04:55		20:43 (WEA06)
	16:26	17:23	18:17	20:15		21:09			21:52	31	21:14 (WEA06)
11	08:37	07:53	06:51	06:36		05:32			04:55		20:43 (WEA06)
	16:27	17:25	18:19	20:16		21:11			21:53	31	21:14 (WEA06)
12	08:36	07:51	06:48	06:33		05:30			04:55		20:44 (WEA06)
	16:29	17:27	18:21	20:18		21:12			21:53	31	21:15 (WEA06)
13	08:36	07:49	06:46	06:31		05:28			04:54		20:43 (WEA06)
	16:30	17:29	18:23	20:20		21:14			21:54	31	21:14 (WEA06)
14	08:35	07:47	06:44	06:29		05:26			04:54		20:43 (WEA06)
	16:32	17:31	18:25	20:22		21:16			21:55	31	21:14 (WEA06)
15	08:34	07:45	06:41	06:26	19:52 (WEA05)	05:25			04:54		20:44 (WEA06)
	16:33	17:33	18:27	20:24	4 19:56 (WEA05)	21:17			21:55	31	21:15 (WEA06)
16	08:33	07:43	06:39	06:24	19:51 (WEA05)	05:23			04:54		20:44 (WEA06)
	16:35	17:35	18:29	20:26	7 19:58 (WEA05)	21:19			21:56	31	21:15 (WEA06)
17	08:32	07:41	06:36	06:22	19:49 (WEA05)	05:21			04:54		20:44 (WEA06)
	16:37	17:37	18:30	20:27	11 20:00 (WEA05)	21:21			21:56	31	21:15 (WEA06)
18	08:31	07:39	06:34	06:19	19:49 (WEA05)	05:20			04:54		20:44 (WEA06)
	16:39	17:39	18:32	20:29	13 20:02 (WEA05)	21:22			21:57	31	21:15 (WEA06)
19	08:30	07:37	06:31	06:17	19:47 (WEA05)	05:18		20:49 (WEA06)	04:54		20:45 (WEA06)
	16:40	17:41	18:34	20:31	16 20:03 (WEA05)	21:24	2	20:51 (WEA06)	21:57	30	21:15 (WEA06)
20	08:29	07:34	06:29	06:15	19:47 (WEA05)	05:17		20:48 (WEA06)	04:54		20:45 (WEA06)
	16:42	17:43	18:36	20:33	17 20:04 (WEA05)	21:26	5	20:53 (WEA06)	21:58	31	21:16 (WEA06)
21	08:27	07:32	06:27	06:13	19:46 (WEA05)	05:15		20:47 (WEA06)	04:54		20:45 (WEA06)
	16:44	17:44	18:38	20:35	20 20:06 (WEA05)	21:27	8	20:55 (WEA06)	21:58	31	21:16 (WEA06)
22	08:26	07:30	06:24	06:10	19:46 (WEA05)	05:14		20:46 (WEA06)	04:54		20:46 (WEA06)
	16:46	17:46	18:40	20:37	22 20:08 (WEA05)	21:29	10	20:56 (WEA06)	21:58	31	21:17 (WEA06)
23	08:25	07:28	06:22	06:08	19:46 (WEA05)	05:12		20:44 (WEA06)	04:54		20:46 (WEA06)
	16:48	17:48	18:42	20:38	24 20:10 (WEA05)	21:30	13	20:57 (WEA06)	21:58	31	21:17 (WEA06)
24	08:24	07:26	06:19	06:06	19:46 (WEA05)	05:11		20:44 (WEA06)	04:54		20:46 (WEA06)
	16:49	17:50	18:43	20:40	24 20:10 (WEA05)	21:32	14	20:58 (WEA06)	21:58	30	21:16 (WEA06)
25	08:22	07:23	06:17	06:04	19:47 (WEA05)	05:10		20:43 (WEA06)	04:55		20:46 (WEA06)
	16:51	17:52	18:45	20:42	23 20:10 (WEA05)	21:33	17	21:00 (WEA06)	21:58	31	21:17 (WEA06)
26	08:21	07:21	06:14	06:02	19:46 (WEA05)	05:09		20:43 (WEA06)	04:55		20:46 (WEA06)
	16:53	17:54	18:47	20:44	22 20:08 (WEA05)	21:35	18	21:01 (WEA06)	21:58	31	21:17 (WEA06)
27	08:19	07:19	06:12	05:59	19:47 (WEA05)	05:07		20:43 (WEA06)	04:56		20:47 (WEA06)
	16:55	17:56	18:49	20:46	20 20:07 (WEA05)	21:36	20	21:03 (WEA06)	21:58	31	21:18 (WEA06)
28	08:18	07:17	06:09	05:57	19:48 (WEA05)	05:06		20:43 (WEA06)	04:56		20:47 (WEA06)
	16:57	17:58	18:51	20:48	18 20:06 (WEA05)	21:37	21	21:04 (WEA06)	21:58	31	21:18 (WEA06)
29	08:16		07:07	05:55	19:49 (WEA05)	05:05		20:42 (WEA06)	04:57		20:47 (WEA06)
	16:59		19:53	20:49	16 20:05 (WEA05)	21:39	23	21:05 (WEA06)	21:58	31	21:18 (WEA06)
30	08:15		07:05	05:53	19:50 (WEA05)	05:04		20:42 (WEA06)	04:57		20:47 (WEA06)
	17:01		19:54	20:51	13 20:03 (WEA05)	21:40	24	21:06 (WEA06)	21:58	31	21:18 (WEA06)
31	08:13		07:02			05:03		20:42 (WEA06)			
	17:03		19:56			21:41	25	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420		493			509		
astr.max.mögl.Beschattung					270		206			916	
Red.Sonnenscheinwahrsch.					0,37		0,43			0,39	
Reduktion Betriebsdauer					0,95		0,95			0,95	
Reduktion Windrichtung					0,62		0,62			0,62	
Gesamte Reduktion					0,22		0,25			0,23	
Met.wahrsch.Beschattung					59		52			207	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP21 - Auf der Stroth 18, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September	Oktober	November	Dezember
1	04:58		20:47 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	31	21:18 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:48 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	31	21:19 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:47 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	31	21:18 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:48 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	31	21:19 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:48 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	31	21:19 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:48 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	31	21:19 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:49 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	30	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		20:49 (WEA06)	05:49		06:44	07:37	07:35	08:26
	21:54	30	21:19 (WEA06)	21:09		19:59	18:46	16:40	16:05
9	05:05		20:49 (WEA06)	05:51		06:45	07:39	07:37	08:28
	21:53	29	21:18 (WEA06)	21:07		19:57	18:44	16:38	16:05
10	05:06		20:50 (WEA06)	05:53		06:47	07:40	07:39	08:29
	21:52	28	21:18 (WEA06)	21:05		19:55	18:41	16:36	16:04
11	05:07		20:50 (WEA06)	05:55		06:49	07:42	07:41	08:30
	21:51	27	21:17 (WEA06)	21:03		19:52	18:39	16:34	16:04
12	05:08		20:50 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	26	21:16 (WEA06)	21:01	8 20:09 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		20:50 (WEA06)	05:58	19:58 (WEA05)	06:52	07:46	07:45	08:32
	21:49	25	21:15 (WEA06)	20:59	14 20:12 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		20:51 (WEA06)	06:00	19:57 (WEA05)	06:54	07:48	07:47	08:33
	21:48	23	21:14 (WEA06)	20:57	17 20:14 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		20:51 (WEA06)	06:01	19:55 (WEA05)	06:56	07:50	07:49	08:34
	21:47	22	21:13 (WEA06)	20:55	19 20:14 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		20:51 (WEA06)	06:03	19:54 (WEA05)	06:58	07:52	07:51	08:35
	21:46	21	21:12 (WEA06)	20:53	21 20:15 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		20:52 (WEA06)	06:05	19:54 (WEA05)	06:59	07:53	07:52	08:36
	21:45	19	21:11 (WEA06)	20:51	22 20:16 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		20:53 (WEA06)	06:07	19:52 (WEA05)	07:01	07:55	07:54	08:37
	21:44	17	21:10 (WEA06)	20:48	24 20:16 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		20:53 (WEA06)	06:08	19:52 (WEA05)	07:03	07:57	07:56	08:37
	21:42	16	21:09 (WEA06)	20:46	24 20:16 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		20:55 (WEA06)	06:10	19:52 (WEA05)	07:05	07:59	07:58	08:38
	21:41	13	21:08 (WEA06)	20:44	23 20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		20:55 (WEA06)	06:12	19:51 (WEA05)	07:06	08:01	08:00	08:39
	21:40	12	21:07 (WEA06)	20:42	22 20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		20:56 (WEA06)	06:14	19:51 (WEA05)	07:08	08:03	08:02	08:39
	21:38	9	21:05 (WEA06)	20:40	20 20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23		20:58 (WEA06)	06:16	19:51 (WEA05)	07:10	08:05	08:03	08:40
	21:37	6	21:04 (WEA06)	20:37	18 20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25		20:59 (WEA06)	06:17	19:51 (WEA05)	07:12	08:07	08:05	08:40
	21:35	4	21:03 (WEA06)	20:35	15 20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19	19:51 (WEA05)	07:13	07:09	08:07	08:40
	21:34			20:33	13 20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21	19:52 (WEA05)	07:15	07:10	08:08	08:41
	21:32			20:30	10 20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29			06:23	19:53 (WEA05)	07:17	07:12	08:10	08:41
	21:31			20:28	6 19:59 (WEA05)	19:13	17:03	16:13	16:09
28	05:31			06:24	19:54 (WEA05)	07:19	07:14	08:12	08:41
	21:29			20:26	3 19:57 (WEA05)	19:10	17:01	16:12	16:10
29	05:33			06:26		07:21	07:16	08:13	08:41
	21:28			20:23		19:08	16:59	16:11	16:11
30	05:34			06:28		07:22	07:18	08:15	08:41
	21:26			20:21		19:05	16:57	16:10	16:12
31	05:36			06:30			07:20		08:41
	21:24			20:19			16:55		16:13
Sonnenscheinstunden	511			459		382	329	260	234
astr.max.mögl.Beschattung		543		279					
Red.Sonnenscheinwahrsch.		0,38		0,42					
Reduktion Betriebsdauer		0,95		0,95					
Reduktion Windrichtung		0,62		0,62					
Gesamte Reduktion		0,22		0,25					
Met.wahrsch.Beschattung		120		69					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP22 - Auf der Stroth 24, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		07:00		19:04 (WEA09)		05:51	
	16:14		17:05		18:00		19:58	14	19:18 (WEA09)		20:53	21
2	08:41		08:10		07:12		06:57		19:07 (WEA09)		05:49	
	16:15		17:07		18:02		20:00	8	19:15 (WEA09)		20:55	20
3	08:41		08:08		07:10		06:55				05:47	
	16:16		17:09		18:04		20:02				20:57	18
4	08:41		08:06		07:07		06:52				05:45	
	16:17		17:11		18:06		20:04				20:58	14
5	08:40		08:04		07:05		06:50				05:43	
	16:19		17:13		18:08		20:05				21:00	9
6	08:40		08:03		07:03		06:48				05:41	
	16:20		17:15		18:10		20:07				21:02	
7	08:39		08:01		07:00		06:45				05:39	
	16:21		17:17		18:12		20:09				21:04	
8	08:39		07:59		06:58		06:43				05:37	
	16:23		17:19		18:14		20:11				21:05	
9	08:38		07:57		06:56		06:40				05:35	
	16:24		17:21		18:15		20:13				21:07	
10	08:38		07:55		06:53		06:38				05:33	
	16:26		17:23		18:17		20:15				21:09	
11	08:37		07:53		06:51		06:36				05:32	
	16:27		17:25		18:19		20:16				21:11	
12	08:36		07:51		06:48		06:33				05:30	
	16:29		17:27		18:21		20:18				21:12	
13	08:36		07:49		06:46		06:31				05:28	
	16:30		17:29		18:23		20:20				21:14	
14	08:35		07:47		06:44		06:29				05:26	
	16:32		17:31		18:25		20:22				21:16	
15	08:34		07:45		06:41		06:26				05:25	
	16:33		17:33		18:27		20:24				21:17	
16	08:33		07:43		06:39		06:24				05:23	
	16:35		17:35		18:29		20:26				21:19	
17	08:32		07:41		06:36		06:22		19:57 (WEA05)		05:21	
	16:37		17:37		18:30		20:27	3	20:00 (WEA05)		21:21	
18	08:31		07:39		06:34		06:19		19:55 (WEA05)		05:20	
	16:39		17:39		18:32		20:29	7	20:02 (WEA05)		21:22	
19	08:30		07:37		06:31		06:17		19:53 (WEA05)		05:18	
	16:40		17:41		18:34		20:31	10	20:03 (WEA05)		21:24	
20	08:29		07:34		06:29		06:15		19:52 (WEA05)		05:17	
	16:42		17:43		18:36	1	20:33	12	20:04 (WEA05)		21:26	
21	08:27		07:32		06:27		06:13		19:51 (WEA05)		05:15	
	16:44		17:44		18:38	5	20:35	15	20:06 (WEA05)		21:27	
22	08:26		07:30		06:24		06:10		19:50 (WEA05)		05:14	
	16:46		17:46		18:40	9	20:37	18	20:08 (WEA05)		21:29	
23	08:25		07:28		06:22		06:08		19:50 (WEA05)		05:12	
	16:48		17:48		18:42	12	20:38	20	20:10 (WEA05)		21:30	
24	08:24		07:26		06:19		06:06		19:49 (WEA05)		05:11	
	16:49		17:50		18:43	14	20:40	23	20:12 (WEA05)		21:32	
25	08:22		07:23		06:17		06:04		19:49 (WEA05)		05:10	
	16:51		17:52		18:45	18	20:42	25	20:14 (WEA05)		21:33	
26	08:21		07:21		06:14		06:02		19:49 (WEA05)		05:09	
	16:53		17:54		18:47	20	20:44	26	20:15 (WEA05)		21:35	
27	08:19		07:19		06:12		05:59		19:48 (WEA05)		05:07	
	16:55		17:56		18:49	21	20:46	26	20:14 (WEA05)		21:36	1
28	08:18		07:17		06:09		05:57		19:48 (WEA05)		05:06	
	16:57		17:58		18:51	23	20:48	26	20:14 (WEA05)		21:37	4
29	08:16				07:07		05:55		19:49 (WEA05)		05:05	
	16:59				19:53	21	20:49	24	20:13 (WEA05)		21:39	6
30	08:15				07:05		05:53		19:49 (WEA05)		05:04	
	17:01				19:54	19	20:51	23	20:12 (WEA05)		21:40	8
31	08:13				07:02						05:03	
	17:03				19:56	17					21:41	10
Sonnenscheinstunden	251		274		367		420		493			
astr.max.mögl.Beschattung						180		280		111		
Red.Sonnenscheinwahrsch.						0,28		0,37		0,43		
Reduktion Betriebsdauer						0,95		0,95		0,95		
Reduktion Windrichtung						0,65		0,62		0,62		
Gesamte Reduktion						0,17		0,22		0,25		
Met.wahrsch.Beschattung						31		61		28		

	Juni		
	19:51 (WEA05)	05:02	
	20:12 (WEA05)	21:43	12
	19:51 (WEA05)	05:01	
	20:11 (WEA05)	21:44	14
	19:52 (WEA05)	05:00	
	20:10 (WEA05)	21:45	16
	19:54 (WEA05)	04:59	
	20:08 (WEA05)	21:46	16
	19:56 (WEA05)	04:59	
	20:05 (WEA05)	21:47	18
		04:58	
		21:48	19
		04:57	
		21:49	20
		04:57	
		21:50	21
		04:56	
		21:51	21
		04:56	
		21:52	22
		04:55	
		21:53	23
		04:55	
		21:53	23
		04:54	
		21:54	24
		04:54	
		21:55	25
		04:54	
		21:55	26
		04:54	
		21:56	25
		04:54	
		21:56	26
		04:54	
		21:57	26
		04:54	
		21:57	26
		04:54	
		21:58	27
		04:54	
		21:58	27
		04:54	
		21:58	27
		04:54	
		21:58	26
		04:54	
		21:58	26
		04:55	
		21:58	25
	21:02 (WEA06)	04:56	
	21:03 (WEA06)	21:58	26
	21:00 (WEA06)	04:56	
	21:04 (WEA06)	21:58	25
	20:59 (WEA06)	04:57	
	21:05 (WEA06)	21:58	25
	20:58 (WEA06)	04:57	
	21:06 (WEA06)	21:58	24
	20:57 (WEA06)		
	21:07 (WEA06)		
		509	
		687	
		0,39	
		0,95	
		0,61	
		0,22	
		154	

	20:56 (WEA06)		
	21:08 (WEA06)		
	20:56 (WEA06)		
	21:10 (WEA06)		
	20:55 (WEA06)		
	21:11 (WEA06)		
	20:55 (WEA06)		
	21:11 (WEA06)		
	20:55 (WEA06)		
	21:13 (WEA06)		
	20:54 (WEA06)		
	21:13 (WEA06)		
	20:54 (WEA06)		
	21:14 (WEA06)		
	20:54 (WEA06)		
	21:15 (WEA06)		
	20:55 (WEA06)		
	21:16 (WEA06)		
	20:54 (WEA06)		
	21:16 (WEA06)		
	20:54 (WEA06)		
	21:17 (WEA06)		
	20:55 (WEA06)		
	21:18 (WEA06)		
	20:54 (WEA06)		
	21:18 (WEA06)		
	20:54 (WEA06)		
	21:19 (WEA06)		
	20:54 (WEA06)		
	21:20 (WEA06)		
	20:55 (WEA06)		
	21:20 (WEA06)		
	20:55 (WEA06)		
	21:21 (WEA06)		
	20:55 (WEA06)		
	21:21 (WEA06)		
	20:55 (WEA06)		
	21:21 (WEA06)		
	20:55 (WEA06)		
	21:22 (WEA06)		
	20:55 (WEA06)		
	21:22 (WEA06)		
	20:56 (WEA06)		
	21:23 (WEA06)		
	20:56 (WEA06)		
	21:22 (WEA06)		
	20:56 (WEA06)		
	21:22 (WEA06)		
	20:57 (WEA06)		
	21:23 (WEA06)		
	20:57 (WEA06)		
	21:22 (WEA06)		
	20:57 (WEA06)		
	21:23 (WEA06)		
	20:57 (WEA06)		
	21:22 (WEA06)		
	20:58 (WEA06)		
	21:23 (WEA06)		
	20:58 (WEA06)		
	21:22 (WEA06)		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP22 - Auf der Stroth 24, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		20:58 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	24	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:59 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	23	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:59 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	22	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:59 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	22	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		21:00 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	20	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		21:01 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	19	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		21:01 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	18	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		21:02 (WEA06)	05:49	20:05 (WEA05)	06:44	07:37	07:35	08:26
	21:54	17	21:19 (WEA06)	21:09	10 20:15 (WEA05)	19:59	18:46	16:40	16:05
9	05:05		21:03 (WEA06)	05:51	20:03 (WEA05)	06:45	07:39	07:37	08:28
	21:53	15	21:18 (WEA06)	21:07	15 20:18 (WEA05)	19:57	18:44	16:38	16:05
10	05:06		21:03 (WEA06)	05:53	20:01 (WEA05)	06:47	19:00 (WEA09)	07:40	07:39	08:29
	21:52	15	21:18 (WEA06)	21:05	17 20:18 (WEA05)	19:55	8 19:08 (WEA09)	18:41	16:36	16:04
11	05:07		21:04 (WEA06)	05:55	20:00 (WEA05)	06:49	18:56 (WEA09)	07:42	07:41	08:30
	21:51	13	21:17 (WEA06)	21:03	20 20:20 (WEA05)	19:52	14 19:10 (WEA09)	18:39	16:34	16:04
12	05:08		21:05 (WEA06)	05:56	19:58 (WEA05)	06:51	18:54 (WEA09)	07:44	07:43	08:31
	21:50	11	21:16 (WEA06)	21:01	22 20:20 (WEA05)	19:50	17 19:11 (WEA09)	18:37	16:33	16:04
13	05:10		21:06 (WEA06)	05:58	19:57 (WEA05)	06:52	18:53 (WEA09)	07:46	07:45	08:32
	21:49	9	21:15 (WEA06)	20:59	24 20:21 (WEA05)	19:47	20 19:13 (WEA09)	18:34	16:31	16:04
14	05:11		21:07 (WEA06)	06:00	19:57 (WEA05)	06:54	18:52 (WEA09)	07:48	07:47	08:33
	21:48	7	21:14 (WEA06)	20:57	25 20:22 (WEA05)	19:45	21 19:13 (WEA09)	18:32	16:30	16:04
15	05:12		21:08 (WEA06)	06:01	19:56 (WEA05)	06:56	18:51 (WEA09)	07:50	07:49	08:34
	21:47	5	21:13 (WEA06)	20:55	25 20:21 (WEA05)	19:42	22 19:13 (WEA09)	18:30	16:28	16:04
16	05:13		21:10 (WEA06)	06:03	19:56 (WEA05)	06:58	18:50 (WEA09)	07:52	07:51	08:35
	21:46	2	21:12 (WEA06)	20:53	26 20:22 (WEA05)	19:40	22 19:12 (WEA09)	18:27	16:26	16:04
17	05:15			06:05	19:56 (WEA05)	06:59	18:50 (WEA09)	07:53	07:52	08:36
	21:45			20:51	26 20:22 (WEA05)	19:37	20 19:10 (WEA09)	18:25	16:25	16:04
18	05:16			06:07	19:55 (WEA05)	07:01	18:49 (WEA09)	07:55	07:54	08:37
	21:44			20:48	24 20:19 (WEA05)	19:35	18 19:07 (WEA09)	18:23	16:24	16:04
19	05:18			06:08	19:55 (WEA05)	07:03	18:49 (WEA09)	07:57	07:56	08:37
	21:42			20:46	22 20:17 (WEA05)	19:32	15 19:04 (WEA09)	18:21	16:22	16:04
20	05:19			06:10	19:55 (WEA05)	07:05	18:49 (WEA09)	07:59	07:58	08:38
	21:41			20:44	20 20:15 (WEA05)	19:30	13 19:02 (WEA09)	18:18	16:21	16:05
21	05:20			06:12	19:55 (WEA05)	07:06	18:50 (WEA09)	08:01	08:00	08:39
	21:40			20:42	18 20:13 (WEA05)	19:28	10 19:00 (WEA09)	18:16	16:19	16:05
22	05:22			06:14	19:56 (WEA05)	07:08	18:50 (WEA09)	08:03	08:02	08:39
	21:38			20:40	15 20:11 (WEA05)	19:25	7 18:57 (WEA09)	18:14	16:18	16:06
23	05:23			06:16	19:56 (WEA05)	07:10	18:52 (WEA09)	08:05	08:03	08:40
	21:37			20:37	13 20:09 (WEA05)	19:23	2 18:54 (WEA09)	18:12	16:17	16:06
24	05:25			06:17	19:57 (WEA05)	07:12		08:07	08:05	08:40
	21:35			20:35	9 20:06 (WEA05)	19:20		18:10	16:16	16:07
25	05:26			06:19	19:58 (WEA05)	07:13		07:09	08:07	08:40
	21:34			20:33	6 20:04 (WEA05)	19:18		17:07	16:15	16:07
26	05:28			06:21	20:00 (WEA05)	07:15		07:10	08:08	08:41
	21:32			20:30	2 20:02 (WEA05)	19:15		17:05	16:14	16:08
27	05:29			06:23		07:17		07:12	08:10	08:41
	21:31			20:28		19:13		17:03	16:13	16:09
28	05:31			06:24		07:19		07:14	08:12	08:41
	21:29			20:26		19:10		17:01	16:12	16:10
29	05:33			06:26		07:21		07:16	08:13	08:41
	21:28			20:23		19:08		16:59	16:11	16:11
30	05:34			06:28		07:22		07:18	08:15	08:41
	21:26			20:21		19:05		16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459		382		329	260	234
astr.max.mögl.Beschattung		242		339		209				
Red.Sonnenscheinwahrsch.		0,38		0,42		0,35				
Reduktion Betriebsdauer		0,95		0,95		0,95				
Reduktion Windrichtung		0,61		0,62		0,65				
Gesamte Reduktion		0,22		0,25		0,22				
Met.wahrsch.Beschattung		53		84		45				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP23 - Auf der Stroth 20, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:52 (WEA05)	05:02		20:45 (WEA06)
	16:14	17:05	18:00	19:58			20:53	14	20:06 (WEA05)	21:43	23	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:46 (WEA06)
	16:15	17:07	18:02	20:00			20:55	9	20:03 (WEA05)	21:44	24	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:46 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	25	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:45 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	26	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:46 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	27	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:45 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	28	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:45 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	29	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:46 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	29	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:46 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	30	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:46 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	30	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:46 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	31	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:47 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	31	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:46 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	31	21:17 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:46 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	32	21:18 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:47 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	31	21:18 (WEA06)
16	08:33	07:43	06:39	06:24		19:53 (WEA05)	05:23			04:54		20:47 (WEA06)
	16:35	17:35	18:29	20:26	5	19:58 (WEA05)	21:19			21:56	31	21:18 (WEA06)
17	08:32	07:41	06:36	06:22		19:52 (WEA05)	05:21			04:54		20:47 (WEA06)
	16:37	17:37	18:30	20:27	8	20:00 (WEA05)	21:21			21:56	32	21:19 (WEA06)
18	08:31	07:39	06:34	06:19		19:51 (WEA05)	05:20			04:54		20:47 (WEA06)
	16:39	17:39	18:32	20:29	11	20:02 (WEA05)	21:22			21:57	32	21:19 (WEA06)
19	08:30	07:37	06:31	06:17		19:49 (WEA05)	05:18			04:54		20:47 (WEA06)
	16:40	17:41	18:34	20:31	14	20:03 (WEA05)	21:24			21:57	32	21:19 (WEA06)
20	08:29	07:34	06:29	06:15		19:48 (WEA05)	05:17			04:54		20:47 (WEA06)
	16:42	17:43	18:36	20:33	16	20:04 (WEA05)	21:26			21:58	32	21:19 (WEA06)
21	08:27	07:32	06:27	06:13		19:48 (WEA05)	05:15			04:54		20:48 (WEA06)
	16:44	17:44	18:38	20:35	18	20:06 (WEA05)	21:27			21:58	31	21:19 (WEA06)
22	08:26	07:30	06:24	06:10		19:47 (WEA05)	05:14		20:53 (WEA06)	04:54		20:49 (WEA06)
	16:46	17:46	18:40	20:37	21	20:08 (WEA05)	21:29	3	20:56 (WEA06)	21:58	31	21:20 (WEA06)
23	08:25	07:28	06:22	06:08		19:47 (WEA05)	05:12		20:50 (WEA06)	04:54		20:48 (WEA06)
	16:48	17:48	18:42	20:38	23	20:10 (WEA05)	21:30	7	20:57 (WEA06)	21:58	32	21:20 (WEA06)
24	08:24	07:26	06:19	06:06		19:47 (WEA05)	05:11		20:49 (WEA06)	04:54		20:48 (WEA06)
	16:49	17:50	18:43	20:40	25	20:12 (WEA05)	21:32	9	20:58 (WEA06)	21:58	32	21:20 (WEA06)
25	08:22	07:23	06:17	06:04		19:47 (WEA05)	05:10		20:49 (WEA06)	04:55		20:49 (WEA06)
	16:51	17:52	18:45	20:42	25	20:12 (WEA05)	21:33	11	21:00 (WEA06)	21:58	32	21:21 (WEA06)
26	08:21	07:21	06:14	06:02		19:47 (WEA05)	05:09		20:48 (WEA06)	04:55		20:49 (WEA06)
	16:53	17:54	18:47	20:44	23	20:10 (WEA05)	21:35	13	21:01 (WEA06)	21:58	31	21:20 (WEA06)
27	08:19	07:19	06:12	05:59		19:47 (WEA05)	05:07		20:47 (WEA06)	04:56		20:50 (WEA06)
	16:55	17:56	18:49	20:46	23	20:10 (WEA05)	21:36	16	21:03 (WEA06)	21:58	31	21:21 (WEA06)
28	08:18	07:17	06:09	05:57		19:48 (WEA05)	05:06		20:47 (WEA06)	04:56		20:49 (WEA06)
	16:57	17:58	18:51	20:48	21	20:09 (WEA05)	21:37	17	21:04 (WEA06)	21:58	32	21:21 (WEA06)
29	08:16		07:07	05:55		19:48 (WEA05)	05:05		20:46 (WEA06)	04:57		20:50 (WEA06)
	16:59		19:53	20:49	20	20:08 (WEA05)	21:39	19	21:05 (WEA06)	21:58	31	21:21 (WEA06)
30	08:15		07:05	05:53		19:49 (WEA05)	05:04		20:46 (WEA06)	04:57		20:50 (WEA06)
	17:01		19:54	20:51	17	20:06 (WEA05)	21:40	20	21:06 (WEA06)	21:58	31	21:21 (WEA06)
31	08:13		07:02				05:03		20:46 (WEA06)			
	17:03		19:56				21:41	21	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					270			159			900	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,61			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					59			40			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP23 - Auf der Stroth 20, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58		20:50 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	32	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:51 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	31	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:50 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	31	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:51 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	30	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:51 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	29	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:52 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	28	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:52 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	27	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		20:53 (WEA06)	05:49		06:44	07:37	07:35	08:26
	21:54	26	21:19 (WEA06)	21:09		19:59	18:46	16:40	16:05
9	05:05		20:53 (WEA06)	05:51		06:45	07:39	07:37	08:28
	21:53	25	21:18 (WEA06)	21:07		19:57	18:44	16:38	16:05
10	05:06		20:53 (WEA06)	05:53		06:47	07:40	07:39	08:29
	21:52	25	21:18 (WEA06)	21:05		19:55	18:41	16:36	16:04
11	05:07		20:54 (WEA06)	05:55	20:02 (WEA05)	06:49	07:42	07:41	08:30
	21:51	23	21:17 (WEA06)	21:03	10	20:12 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		20:54 (WEA06)	05:56		19:59 (WEA05)	06:51	07:44	07:43	08:31
	21:50	22	21:16 (WEA06)	21:01	15	20:14 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		20:54 (WEA06)	05:58		19:58 (WEA05)	06:52	07:46	07:45	08:32
	21:49	21	21:15 (WEA06)	20:59	17	20:15 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		20:55 (WEA06)	06:00		19:57 (WEA05)	06:54	07:48	07:47	08:33
	21:48	19	21:14 (WEA06)	20:57	20	20:17 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		20:55 (WEA06)	06:01		19:55 (WEA05)	06:56	07:50	07:49	08:34
	21:47	18	21:13 (WEA06)	20:55	22	20:17 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		20:56 (WEA06)	06:03		19:54 (WEA05)	06:58	07:52	07:51	08:35
	21:46	16	21:12 (WEA06)	20:53	23	20:17 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		20:57 (WEA06)	06:05		19:54 (WEA05)	06:59	07:53	07:52	08:36
	21:45	14	21:11 (WEA06)	20:51	24	20:18 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		20:58 (WEA06)	06:07		19:53 (WEA05)	07:01	07:55	07:54	08:37
	21:44	12	21:10 (WEA06)	20:48	25	20:18 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		20:58 (WEA06)	06:08		19:53 (WEA05)	07:03	07:57	07:56	08:37
	21:42	11	21:09 (WEA06)	20:46	24	20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		21:00 (WEA06)	06:10		19:53 (WEA05)	07:05	07:59	07:58	08:38
	21:41	8	21:08 (WEA06)	20:44	22	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		21:01 (WEA06)	06:12		19:52 (WEA05)	07:06	08:01	08:00	08:39
	21:40	6	21:07 (WEA06)	20:42	21	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		21:03 (WEA06)	06:14		19:52 (WEA05)	07:08	08:03	08:02	08:39
	21:38	2	21:05 (WEA06)	20:40	19	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23			06:16		19:53 (WEA05)	07:10	08:05	08:03	08:40
	21:37			20:37	16	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17		19:53 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	13	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19		19:53 (WEA05)	07:13	07:09	08:07	08:40
	21:34			20:33	11	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21		19:55 (WEA05)	07:15	07:10	08:08	08:41
	21:32			20:30	7	20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29			06:23		19:55 (WEA05)	07:17	07:12	08:10	08:41
	21:31			20:28	4	19:59 (WEA05)	19:13	17:03	16:13	16:09
28	05:31			06:24			07:19	07:14	08:12	08:41
	21:29			20:26			19:10	17:01	16:12	16:10
29	05:33			06:26			07:21	07:16	08:13	08:41
	21:28			20:23			19:08	16:59	16:11	16:11
30	05:34			06:28			07:22	07:18	08:15	08:41
	21:26			20:21			19:05	16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459			382	329	260	234
astr.max.mögl.Beschattung		456		293						
Red.Sonnenscheinwahrsch.		0,38		0,42						
Reduktion Betriebsdauer		0,95		0,95						
Reduktion Windrichtung		0,62		0,61						
Gesamte Reduktion		0,22		0,25						
Met.wahrsch.Beschattung		101		72						

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP24 - Auf der Stroth 23, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:53 (WEA05)	05:02		20:51 (WEA06)
	16:14	17:05	18:00	19:58			20:53	20	20:13 (WEA05)	21:43	17	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:51 (WEA06)
	16:15	17:07	18:02	20:00			20:55	17	20:11 (WEA05)	21:44	19	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47		19:56 (WEA05)	05:00		20:51 (WEA06)
	16:16	17:09	18:04	20:02			20:57	13	20:09 (WEA05)	21:45	20	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45		19:58 (WEA05)	04:59		20:50 (WEA06)
	16:17	17:11	18:06	20:04			20:58	9	20:07 (WEA05)	21:46	21	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:51 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	22	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:51 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	22	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:50 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	24	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:51 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	24	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:51 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	25	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:51 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	25	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:51 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	26	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:51 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	27	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:51 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	27	21:18 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:51 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	28	21:19 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:51 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	29	21:20 (WEA06)
16	08:33	07:43	06:39	06:24			05:23			04:54		20:52 (WEA06)
	16:35	17:35	18:29	20:26			21:19			21:56	28	21:20 (WEA06)
17	08:32	07:41	06:36	06:22			05:21			04:54		20:52 (WEA06)
	16:37	17:37	18:30	20:27			21:21			21:56	29	21:21 (WEA06)
18	08:31	07:39	06:34	06:19		19:58 (WEA05)	05:20			04:54		20:52 (WEA06)
	16:39	17:39	18:32	20:29	4	20:02 (WEA05)	21:22			21:57	29	21:21 (WEA06)
19	08:30	07:37	06:31	06:17		19:55 (WEA05)	05:18			04:54		20:52 (WEA06)
	16:40	17:41	18:34	20:31	8	20:03 (WEA05)	21:24			21:57	29	21:21 (WEA06)
20	08:29	07:34	06:29	06:15		19:54 (WEA05)	05:17			04:54		20:52 (WEA06)
	16:42	17:43	18:36	20:33	10	20:04 (WEA05)	21:26			21:58	30	21:22 (WEA06)
21	08:27	07:32	06:27	06:13		19:53 (WEA05)	05:15			04:54		20:52 (WEA06)
	16:44	17:44	18:38	20:35	13	20:06 (WEA05)	21:27			21:58	30	21:22 (WEA06)
22	08:26	07:30	06:24	06:10		19:53 (WEA05)	05:14			04:54		20:53 (WEA06)
	16:46	17:46	18:40	20:37	15	20:08 (WEA05)	21:29			21:58	30	21:23 (WEA06)
23	08:25	07:28	06:22	06:08		19:52 (WEA05)	05:12			04:54		20:53 (WEA06)
	16:48	17:48	18:42	20:38	18	20:10 (WEA05)	21:30			21:58	29	21:22 (WEA06)
24	08:24	07:26	06:19	06:06		19:52 (WEA05)	05:11		20:57 (WEA06)	04:54		20:53 (WEA06)
	16:49	17:50	18:43	20:40	20	20:12 (WEA05)	21:32	1	20:58 (WEA06)	21:58	29	21:22 (WEA06)
25	08:22	07:23	06:17	06:04		19:52 (WEA05)	05:10		20:56 (WEA06)	04:55		20:54 (WEA06)
	16:51	17:52	18:45	20:42	22	20:14 (WEA05)	21:33	4	21:00 (WEA06)	21:58	29	21:23 (WEA06)
26	08:21	07:21	06:14	06:02		19:51 (WEA05)	05:09		20:55 (WEA06)	04:55		20:54 (WEA06)
	16:53	17:54	18:47	20:44	23	20:14 (WEA05)	21:35	6	21:01 (WEA06)	21:58	28	21:22 (WEA06)
27	08:19	07:19	06:12	05:59		19:51 (WEA05)	05:07		20:54 (WEA06)	04:56		20:54 (WEA06)
	16:55	17:56	18:49	20:46	24	20:15 (WEA05)	21:36	8	21:02 (WEA06)	21:58	29	21:23 (WEA06)
28	08:18	07:17	06:09	05:57		19:51 (WEA05)	05:06		20:53 (WEA06)	04:56		20:54 (WEA06)
	16:57	17:58	18:51	20:48	23	20:14 (WEA05)	21:37	11	21:04 (WEA06)	21:58	28	21:22 (WEA06)
29	08:16		07:07	05:55		19:51 (WEA05)	05:05		20:52 (WEA06)	04:57		20:55 (WEA06)
	16:59		19:53	20:49	23	20:14 (WEA05)	21:39	13	21:05 (WEA06)	21:58	28	21:23 (WEA06)
30	08:15		07:05	05:53		19:52 (WEA05)	05:04		20:52 (WEA06)	04:57		20:54 (WEA06)
	17:01		19:54	20:51	21	20:13 (WEA05)	21:40	14	21:06 (WEA06)	21:58	28	21:22 (WEA06)
31	08:13		07:02				05:03		20:51 (WEA06)			
	17:03		19:56				21:41	16	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					224			132			789	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					49			33			178	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP24 - Auf der Stroth 23, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58		20:55 (WEA06)	05:38		06:31	07:24	07:22	08:16
	21:57	27	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:56 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	26	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:55 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	26	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:56 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	25	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:56 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	24	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:57 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	23	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:57 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	22	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		20:58 (WEA06)	05:49	20:11 (WEA05)	06:44	07:37	07:35	08:26
	21:54	21	21:19 (WEA06)	21:09	2 20:13 (WEA05)	19:59	18:46	16:40	16:05
9	05:05		20:58 (WEA06)	05:51	20:07 (WEA05)	06:45	07:39	07:37	08:28
	21:53	20	21:18 (WEA06)	21:07	10 20:17 (WEA05)	19:57	18:44	16:38	16:05
10	05:06		20:59 (WEA06)	05:53	20:04 (WEA05)	06:47	07:40	07:39	08:29
	21:52	19	21:18 (WEA06)	21:05	14 20:18 (WEA05)	19:55	18:41	16:36	16:04
11	05:07		20:59 (WEA06)	05:55	20:03 (WEA05)	06:49	07:42	07:41	08:30
	21:51	18	21:17 (WEA06)	21:03	17 20:20 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		21:00 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	16	21:16 (WEA06)	21:01	19 20:20 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		21:00 (WEA06)	05:58	20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	15	21:15 (WEA06)	20:59	21 20:21 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		21:01 (WEA06)	06:00	20:00 (WEA05)	06:54	07:48	07:47	08:33
	21:48	13	21:14 (WEA06)	20:57	22 20:22 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		21:01 (WEA06)	06:01	19:58 (WEA05)	06:56	07:50	07:49	08:34
	21:47	12	21:13 (WEA06)	20:55	24 20:22 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		21:02 (WEA06)	06:03	19:58 (WEA05)	06:58	07:52	07:51	08:35
	21:46	10	21:12 (WEA06)	20:53	24 20:22 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		21:04 (WEA06)	06:05	19:58 (WEA05)	06:59	07:53	07:52	08:36
	21:45	7	21:11 (WEA06)	20:51	24 20:22 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		21:05 (WEA06)	06:07	19:57 (WEA05)	07:01	07:55	07:54	08:37
	21:44	5	21:10 (WEA06)	20:48	22 20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		21:06 (WEA06)	06:08	19:57 (WEA05)	07:03	07:57	07:56	08:37
	21:42	3	21:09 (WEA06)	20:46	20 20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19			06:10	19:58 (WEA05)	07:05	07:59	07:58	08:38
	21:41			20:44	17 20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20			06:12	19:57 (WEA05)	07:06	08:01	08:00	08:39
	21:40			20:42	16 20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22			06:14	19:58 (WEA05)	07:08	08:03	08:02	08:39
	21:38			20:40	13 20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23			06:16	19:59 (WEA05)	07:10	08:05	08:03	08:40
	21:37			20:37	10 20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17	19:59 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	7 20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19	20:01 (WEA05)	07:13	07:08	08:07	08:40
	21:34			20:33	3 20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21		07:15	07:10	08:08	08:41
	21:32			20:30		19:15	17:05	16:14	16:08
27	05:29			06:23		07:17	07:12	08:10	08:41
	21:31			20:28		19:13	17:03	16:13	16:09
28	05:31			06:24		07:19	07:14	08:12	08:41
	21:29			20:26		19:10	17:01	16:12	16:10
29	05:33			06:26		07:21	07:16	08:13	08:41
	21:28			20:23		19:08	16:59	16:11	16:11
30	05:34			06:28		07:22	07:18	08:15	08:41
	21:26			20:21		19:05	16:57	16:10	16:12
31	05:36			06:30			07:20		08:41
	21:24			20:19			16:55		16:13
Sonnenscheinstunden	511			459		382	329	260	234
astr.max.mögl.Beschattung		332		285					
Red.Sonnenscheinwahrsch.		0,38		0,42					
Reduktion Betriebsdauer		0,95		0,95					
Reduktion Windrichtung		0,62		0,62					
Gesamte Reduktion		0,22		0,25					
Met.wahrsch.Beschattung		73		71					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP25 - Auf der Stroth 21, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April			Mai			Juni		
1	08:41		08:11		07:14		07:00			05:51		19:54 (WEA05)	05:02		20:45 (WEA06)
	16:14		17:05		18:00		19:58			20:53	14	20:08 (WEA05)	21:43	23	21:08 (WEA06)
2	08:41		08:10		07:12		06:57			05:49		19:56 (WEA05)	05:01		20:46 (WEA06)
	16:15		17:07		18:02		20:00			20:55	9	20:05 (WEA05)	21:44	24	21:10 (WEA06)
3	08:41		08:08		07:10		06:55			05:47			05:00		20:46 (WEA06)
	16:16		17:09		18:04		20:02			20:57			21:45	25	21:11 (WEA06)
4	08:41		08:06		07:07		06:52			05:45			04:59		20:45 (WEA06)
	16:17		17:11		18:06		20:04			20:58			21:46	26	21:11 (WEA06)
5	08:40		08:04		07:05		06:50			05:43			04:59		20:46 (WEA06)
	16:19		17:13		18:08		20:05			21:00			21:47	27	21:13 (WEA06)
6	08:40		08:03		07:03		06:48			05:41			04:58		20:46 (WEA06)
	16:20		17:15		18:10		20:07			21:02			21:48	27	21:13 (WEA06)
7	08:39		08:01		07:00		06:45			05:39			04:57		20:45 (WEA06)
	16:21		17:17		18:12		20:09			21:04			21:49	29	21:14 (WEA06)
8	08:39		07:59		06:58		06:43			05:37			04:57		20:46 (WEA06)
	16:23		17:19		18:13		20:11			21:05			21:50	29	21:15 (WEA06)
9	08:38		07:57		06:56		06:40			05:35			04:56		20:46 (WEA06)
	16:24		17:21		18:15		20:13			21:07			21:51	30	21:16 (WEA06)
10	08:38		07:55		06:53		06:38			05:33			04:55		20:46 (WEA06)
	16:26		17:23		18:17		20:15			21:09			21:52	30	21:16 (WEA06)
11	08:37		07:53		06:51		06:36			05:32			04:55		20:46 (WEA06)
	16:27		17:25		18:19		20:16			21:11			21:53	30	21:16 (WEA06)
12	08:36		07:51		06:48		06:33			05:30			04:55		20:47 (WEA06)
	16:29		17:27		18:21		20:18			21:12			21:53	30	21:17 (WEA06)
13	08:36		07:49		06:46		06:31			05:28			04:54		20:46 (WEA06)
	16:30		17:29		18:23		20:20			21:14			21:54	30	21:16 (WEA06)
14	08:35		07:47		06:44		06:29			05:26			04:54		20:47 (WEA06)
	16:32		17:31		18:25		20:22			21:16			21:55	30	21:17 (WEA06)
15	08:34		07:45		06:41		06:26			05:25			04:54		20:47 (WEA06)
	16:33		17:33		18:27		20:24			21:17			21:55	30	21:17 (WEA06)
16	08:33		07:43		06:39		06:24		19:57 (WEA05)	05:23			04:54		20:47 (WEA06)
	16:35		17:35		18:29		20:26	1	19:58 (WEA05)	21:19			21:56	30	21:17 (WEA06)
17	08:32		07:41		06:36		06:22		19:55 (WEA05)	05:21			04:54		20:47 (WEA06)
	16:37		17:37		18:30		20:27	5	20:00 (WEA05)	21:21			21:56	31	21:18 (WEA06)
18	08:31		07:39		06:34		06:19		19:54 (WEA05)	05:20			04:54		20:48 (WEA06)
	16:39		17:39		18:32		20:29	8	20:02 (WEA05)	21:22			21:57	30	21:18 (WEA06)
19	08:30		07:37		06:31		06:17		19:52 (WEA05)	05:18			04:54		20:48 (WEA06)
	16:40		17:41		18:34		20:31	11	20:03 (WEA05)	21:24			21:57	30	21:18 (WEA06)
20	08:29		07:34		06:29		06:15		19:51 (WEA05)	05:17			04:54		20:48 (WEA06)
	16:42		17:43		18:36		20:33	13	20:04 (WEA05)	21:26			21:58	30	21:18 (WEA06)
21	08:27		07:32		06:27		06:13		19:50 (WEA05)	05:15		20:52 (WEA06)	04:54		20:48 (WEA06)
	16:44		17:44		18:38		20:35	16	20:06 (WEA05)	21:27	3	20:55 (WEA06)	21:58	30	21:18 (WEA06)
22	08:26		07:30		06:24		06:10		19:50 (WEA05)	05:14		20:51 (WEA06)	04:54		20:49 (WEA06)
	16:46		17:46		18:40		20:37	18	20:08 (WEA05)	21:29	5	20:56 (WEA06)	21:58	30	21:19 (WEA06)
23	08:25		07:28		06:22		06:08		19:50 (WEA05)	05:12		20:49 (WEA06)	04:54		20:49 (WEA06)
	16:48		17:48		18:42		20:38	20	20:10 (WEA05)	21:30	8	20:57 (WEA06)	21:58	30	21:19 (WEA06)
24	08:24		07:26		06:19		06:06		19:50 (WEA05)	05:11		20:48 (WEA06)	04:54		20:49 (WEA06)
	16:49		17:50		18:43		20:40	22	20:12 (WEA05)	21:32	10	20:58 (WEA06)	21:58	30	21:19 (WEA06)
25	08:22		07:23		06:17		06:04		19:50 (WEA05)	05:10		20:48 (WEA06)	04:55		20:50 (WEA06)
	16:51		17:52		18:45		20:42	24	20:14 (WEA05)	21:33	12	21:00 (WEA06)	21:58	30	21:20 (WEA06)
26	08:21		07:21		06:14		06:02		19:49 (WEA05)	05:09		20:47 (WEA06)	04:55		20:49 (WEA06)
	16:53		17:54		18:47		20:44	23	20:12 (WEA05)	21:35	14	21:01 (WEA06)	21:58	30	21:19 (WEA06)
27	08:19		07:19		06:12		05:59		19:49 (WEA05)	05:07		20:47 (WEA06)	04:56		20:50 (WEA06)
	16:55		17:56		18:49		20:46	23	20:12 (WEA05)	21:36	16	21:03 (WEA06)	21:58	30	21:20 (WEA06)
28	08:18		07:17		06:09		05:57		19:50 (WEA05)	05:06		20:46 (WEA06)	04:56		20:50 (WEA06)
	16:57		17:58		18:51		20:48	21	20:11 (WEA05)	21:37	18	21:04 (WEA06)	21:58	30	21:20 (WEA06)
29	08:16				07:07		05:55		19:51 (WEA05)	05:05		20:46 (WEA06)	04:57		20:50 (WEA06)
	16:59				19:53		20:49	19	20:10 (WEA05)	21:39	19	21:05 (WEA06)	21:58	31	21:21 (WEA06)
30	08:15				07:05		05:53		19:52 (WEA05)	05:04		20:46 (WEA06)	04:57		20:50 (WEA06)
	17:01				19:54		20:51	16	20:08 (WEA05)	21:40	20	21:06 (WEA06)	21:58	30	21:20 (WEA06)
31	08:13				07:02					05:03		20:45 (WEA06)			
	17:03				19:56					21:41	22	21:07 (WEA06)			
Sonnenscheinstunden	251		274		367		420			493			509		
astr.max.mögl.Beschattung								240			170			872	
Red.Sonnenscheinwahrsch.								0,37			0,43			0,39	
Reduktion Betriebsdauer								0,95			0,95			0,95	
Reduktion Windrichtung								0,62			0,62			0,62	
Gesamte Reduktion								0,22			0,25			0,23	
Met.wahrsch.Beschattung								52			43			197	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP25 - Auf der Stroth 21, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58	20:51 (WEA06)	05:38		06:31	07:24	07:22	08:16
	21:57	30 21:21 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59	20:51 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	30 21:21 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00	20:51 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	30 21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00	20:51 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	30 21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01	20:51 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	29 21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02	20:52 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	28 21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03	20:52 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	27 21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04	20:53 (WEA06)	05:49		06:44	07:37	07:35	08:26
	21:54	26 21:19 (WEA06)	21:09		19:59	18:46	16:40	16:05
9	05:05	20:53 (WEA06)	05:51		06:45	07:39	07:37	08:28
	21:53	25 21:18 (WEA06)	21:07		19:57	18:44	16:38	16:05
10	05:06	20:53 (WEA06)	05:53	20:08 (WEA05)	06:47	07:40	07:39	08:29
	21:52	25 21:18 (WEA06)	21:05	2 20:10 (WEA05)	19:55	18:41	16:36	16:04
11	05:07	20:53 (WEA06)	05:55	20:04 (WEA05)	06:49	07:42	07:41	08:30
	21:51	24 21:17 (WEA06)	21:03	11 20:15 (WEA05)	19:52	18:39	16:34	16:04
12	05:08	20:54 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	22 21:16 (WEA06)	21:01	15 20:16 (WEA05)	19:50	18:37	16:33	16:04
13	05:10	20:54 (WEA06)	05:58	20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	21 21:15 (WEA06)	20:59	17 20:17 (WEA05)	19:47	18:34	16:31	16:04
14	05:11	20:54 (WEA06)	06:00	19:59 (WEA05)	06:54	07:48	07:47	08:33
	21:48	20 21:14 (WEA06)	20:57	20 20:19 (WEA05)	19:45	18:32	16:30	16:04
15	05:12	20:55 (WEA06)	06:01	19:57 (WEA05)	06:56	07:50	07:49	08:34
	21:47	18 21:13 (WEA06)	20:55	21 20:18 (WEA05)	19:42	18:30	16:28	16:04
16	05:13	20:55 (WEA06)	06:03	19:57 (WEA05)	06:58	07:52	07:51	08:35
	21:46	17 21:12 (WEA06)	20:53	22 20:19 (WEA05)	19:40	18:27	16:26	16:04
17	05:15	20:56 (WEA06)	06:05	19:57 (WEA05)	06:59	07:53	07:52	08:36
	21:45	15 21:11 (WEA06)	20:51	23 20:20 (WEA05)	19:37	18:25	16:25	16:04
18	05:16	20:57 (WEA06)	06:07	19:55 (WEA05)	07:01	07:55	07:54	08:37
	21:44	13 21:10 (WEA06)	20:48	24 20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18	20:57 (WEA06)	06:08	19:55 (WEA05)	07:03	07:57	07:56	08:37
	21:42	12 21:09 (WEA06)	20:46	22 20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19	20:59 (WEA06)	06:10	19:55 (WEA05)	07:05	07:59	07:58	08:38
	21:41	9 21:08 (WEA06)	20:44	20 20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20	21:00 (WEA06)	06:12	19:55 (WEA05)	07:06	08:01	08:00	08:39
	21:40	7 21:07 (WEA06)	20:42	18 20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22	21:01 (WEA06)	06:14	19:55 (WEA05)	07:08	08:03	08:02	08:39
	21:38	4 21:05 (WEA06)	20:40	16 20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23	21:03 (WEA06)	06:16	19:56 (WEA05)	07:10	08:05	08:03	08:40
	21:37	1 21:04 (WEA06)	20:37	13 20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25		06:17	19:56 (WEA05)	07:12	08:07	08:05	08:40
	21:35		20:35	10 20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26		06:19	19:57 (WEA05)	07:13	07:08	08:07	08:40
	21:34		20:33	7 20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28		06:21	19:58 (WEA05)	07:15	07:10	08:08	08:41
	21:32		20:30	4 20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29		06:23		07:17	07:12	08:10	08:41
	21:31		20:28		19:13	17:03	16:13	16:09
28	05:31		06:24		07:19	07:14	08:12	08:41
	21:29		20:26		19:10	17:01	16:12	16:10
29	05:33		06:26		07:21	07:16	08:13	08:41
	21:28		20:23		19:08	16:59	16:11	16:11
30	05:34		06:28		07:22	07:18	08:15	08:41
	21:26		20:21		19:05	16:57	16:10	16:12
31	05:36		06:30			07:20		08:41
	21:24		20:19			16:55		16:13
Sonnenscheinstunden	511		459		382	329	260	234
astr.max.mögl.Beschattung		463		265				
Red.Sonnenscheinwahrsch.		0,38		0,42				
Reduktion Betriebsdauer		0,95		0,95				
Reduktion Windrichtung		0,62		0,62				
Gesamte Reduktion		0,22		0,25				
Met.wahrsch.Beschattung		102		65				

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP26 - Auf der Stroth 25, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:53 (WEA05)	05:02		20:53 (WEA06)
	16:14	17:05	18:00	19:58			20:53	21	20:14 (WEA05)	21:43	15	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:54 (WEA06)
	16:15	17:07	18:02	20:00			20:55	19	20:13 (WEA05)	21:44	16	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47		19:55 (WEA05)	05:00		20:53 (WEA06)
	16:16	17:09	18:04	20:02			20:57	16	20:11 (WEA05)	21:45	18	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45		19:57 (WEA05)	04:59		20:53 (WEA06)
	16:17	17:11	18:06	20:04			20:58	12	20:09 (WEA05)	21:46	18	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43		19:59 (WEA05)	04:59		20:53 (WEA06)
	16:19	17:13	18:08	20:05			21:00	7	20:06 (WEA05)	21:47	20	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:53 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	20	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:52 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	22	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:53 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	22	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:53 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	23	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:52 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	24	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:53 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	24	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:53 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	25	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:53 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	25	21:18 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:53 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	26	21:19 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:53 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	27	21:20 (WEA06)
16	08:33	07:43	06:39	06:24			05:23			04:54		20:53 (WEA06)
	16:35	17:35	18:29	20:26			21:19			21:56	27	21:20 (WEA06)
17	08:32	07:41	06:36	06:22			05:21			04:54		20:54 (WEA06)
	16:37	17:37	18:30	20:27			21:21			21:56	27	21:21 (WEA06)
18	08:31	07:39	06:34	06:19		19:59 (WEA05)	05:20			04:54		20:54 (WEA06)
	16:39	17:39	18:32	20:29	3	20:02 (WEA05)	21:22			21:57	27	21:21 (WEA06)
19	08:30	07:37	06:31	06:17		19:56 (WEA05)	05:18			04:54		20:54 (WEA06)
	16:40	17:41	18:34	20:31	7	20:03 (WEA05)	21:24			21:57	27	21:21 (WEA06)
20	08:29	07:34	06:29	06:15		19:55 (WEA05)	05:17			04:54		20:54 (WEA06)
	16:42	17:43	18:36	20:33	9	20:04 (WEA05)	21:26			21:58	28	21:22 (WEA06)
21	08:27	07:32	06:27	06:13		19:54 (WEA05)	05:15			04:54		20:54 (WEA06)
	16:44	17:44	18:38	20:35	12	20:06 (WEA05)	21:27			21:58	28	21:22 (WEA06)
22	08:26	07:30	06:24	06:10		19:53 (WEA05)	05:14			04:54		20:55 (WEA06)
	16:46	17:46	18:40	20:37	15	20:08 (WEA05)	21:29			21:58	28	21:23 (WEA06)
23	08:25	07:28	06:22	06:08		19:53 (WEA05)	05:12			04:54		20:55 (WEA06)
	16:48	17:48	18:42	20:38	17	20:10 (WEA05)	21:30			21:58	27	21:22 (WEA06)
24	08:24	07:26	06:19	06:06		19:52 (WEA05)	05:11			04:54		20:55 (WEA06)
	16:49	17:50	18:43	20:40	20	20:12 (WEA05)	21:32			21:58	27	21:22 (WEA06)
25	08:22	07:23	06:17	06:04		19:52 (WEA05)	05:10			04:55		20:56 (WEA06)
	16:51	17:52	18:45	20:42	22	20:14 (WEA05)	21:33			21:58	27	21:23 (WEA06)
26	08:21	07:21	06:14	06:02		19:51 (WEA05)	05:09		20:58 (WEA06)	04:55		20:55 (WEA06)
	16:53	17:54	18:47	20:44	23	20:14 (WEA05)	21:35	3	21:01 (WEA06)	21:58	27	21:22 (WEA06)
27	08:19	07:19	06:12	05:59		19:51 (WEA05)	05:07		20:57 (WEA06)	04:56		20:56 (WEA06)
	16:55	17:56	18:49	20:46	25	20:16 (WEA05)	21:36	5	21:02 (WEA06)	21:58	27	21:23 (WEA06)
28	08:18	07:17	06:09	05:57		19:51 (WEA05)	05:06		20:56 (WEA06)	04:56		20:56 (WEA06)
	16:57	17:58	18:51	20:48	24	20:15 (WEA05)	21:37	8	21:04 (WEA06)	21:58	26	21:22 (WEA06)
29	08:16		07:07	05:55		19:51 (WEA05)	05:05		20:55 (WEA06)	04:57		20:57 (WEA06)
	16:59		19:53	20:49	24	20:15 (WEA05)	21:39	10	21:05 (WEA06)	21:58	26	21:23 (WEA06)
30	08:15		07:05	05:53		19:52 (WEA05)	05:04		20:55 (WEA06)	04:57		20:56 (WEA06)
	17:01		19:54	20:51	22	20:14 (WEA05)	21:40	11	21:06 (WEA06)	21:58	26	21:22 (WEA06)
31	08:13		07:02				05:03		20:54 (WEA06)			
	17:03		19:56				21:41	13	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					223			125			730	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,62			0,61	
Gesamte Reduktion					0,22			0,25			0,22	
Met.wahrsch.Beschattung					49			31			164	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP26 - Auf der Stroth 25, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58	20:57 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	25 21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59	20:58 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	24 21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00	20:57 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	24 21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00	20:58 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	23 21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01	20:58 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	22 21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02	20:59 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	21 21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03	20:59 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	20 21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04	21:00 (WEA06)	05:49	20:08 (WEA05)	06:44	07:37	07:35	08:26
	21:54	19 21:19 (WEA06)	21:09	9 20:17 (WEA05)	19:59	18:46	16:40	16:05
9	05:05	21:00 (WEA06)	05:51	20:06 (WEA05)	06:45	07:39	07:37	08:28
	21:53	18 21:18 (WEA06)	21:07	14 20:20 (WEA05)	19:57	18:44	16:38	16:05
10	05:06	21:01 (WEA06)	05:53	20:03 (WEA05)	06:47	07:40	07:39	08:29
	21:52	17 21:18 (WEA06)	21:05	17 20:20 (WEA05)	19:55	18:41	16:36	16:04
11	05:07	21:02 (WEA06)	05:55	20:02 (WEA05)	06:49	07:42	07:41	08:30
	21:51	15 21:17 (WEA06)	21:03	20 20:22 (WEA05)	19:52	18:39	16:34	16:04
12	05:08	21:02 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	14 21:16 (WEA06)	21:01	21 20:22 (WEA05)	19:50	18:37	16:33	16:04
13	05:10	21:03 (WEA06)	05:58	20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	12 21:15 (WEA06)	20:59	23 20:23 (WEA05)	19:47	18:34	16:31	16:04
14	05:11	21:03 (WEA06)	06:00	20:00 (WEA05)	06:54	07:48	07:47	08:33
	21:48	11 21:14 (WEA06)	20:57	23 20:23 (WEA05)	19:45	18:32	16:30	16:04
15	05:12	21:04 (WEA06)	06:01	19:59 (WEA05)	06:56	07:50	07:49	08:34
	21:47	9 21:13 (WEA06)	20:55	24 20:23 (WEA05)	19:42	18:30	16:28	16:04
16	05:13	21:05 (WEA06)	06:03	19:59 (WEA05)	06:58	07:52	07:51	08:35
	21:46	7 21:12 (WEA06)	20:53	24 20:23 (WEA05)	19:40	18:27	16:26	16:04
17	05:15	21:07 (WEA06)	06:05	19:59 (WEA05)	06:59	07:53	07:52	08:36
	21:45	4 21:11 (WEA06)	20:51	23 20:22 (WEA05)	19:37	18:25	16:25	16:04
18	05:16	21:09 (WEA06)	06:07	19:58 (WEA05)	07:01	07:55	07:54	08:37
	21:44	1 21:10 (WEA06)	20:48	21 20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		06:08	19:58 (WEA05)	07:03	07:57	07:56	08:37
	21:42		20:46	19 20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		06:10	19:59 (WEA05)	07:05	07:59	07:58	08:38
	21:41		20:44	16 20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		06:12	19:58 (WEA05)	07:06	08:01	08:00	08:39
	21:40		20:42	15 20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		06:14	19:59 (WEA05)	07:08	08:03	08:02	08:39
	21:38		20:40	12 20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23		06:16	20:00 (WEA05)	07:10	08:05	08:03	08:40
	21:37		20:37	9 20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25		06:17	20:00 (WEA05)	07:12	08:07	08:05	08:40
	21:35		20:35	6 20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26		06:19	20:02 (WEA05)	07:13	07:09	08:07	08:40
	21:34		20:33	2 20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28		06:21		07:15	07:10	08:08	08:41
	21:32		20:30		19:15	17:05	16:14	16:08
27	05:29		06:23		07:17	07:12	08:10	08:41
	21:31		20:28		19:13	17:03	16:13	16:09
28	05:31		06:24		07:19	07:14	08:12	08:41
	21:29		20:26		19:10	17:01	16:12	16:10
29	05:33		06:26		07:21	07:16	08:13	08:41
	21:28		20:23		19:08	16:59	16:11	16:11
30	05:34		06:28		07:22	07:18	08:15	08:41
	21:26		20:21		19:05	16:57	16:10	16:12
31	05:36		06:30			07:20		08:41
	21:24		20:19			16:55		16:13
Sonnenscheinstunden	511		459		382	329	260	234
astr.max.mögl.Beschattung		286		298				
Red.Sonnenscheinwahrsch.		0,38		0,42				
Reduktion Betriebsdauer		0,95		0,95				
Reduktion Windrichtung		0,61		0,62				
Gesamte Reduktion		0,22		0,25				
Met.wahrsch.Beschattung		63		74				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP27 - Strother Heuweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März			April			Mai			Juni		
1	08:41		08:11		07:14			07:00		19:03 (WEA09)	05:51		19:52 (WEA05)	05:02		
	16:14		17:05		18:00			19:58	19	19:22 (WEA09)	20:53	26	20:18 (WEA05)	21:43		
2	08:41		08:10		07:12			06:57		19:04 (WEA09)	05:49		19:52 (WEA05)	05:01		
	16:15		17:07		18:02			20:00	16	19:20 (WEA09)	20:55	26	20:18 (WEA05)	21:44		
3	08:41		08:08		07:10			06:55		19:06 (WEA09)	05:47		19:53 (WEA05)	05:00		
	16:16		17:09		18:04			20:02	11	19:17 (WEA09)	20:57	24	20:17 (WEA05)	21:45		
4	08:41		08:06		07:07			06:52			05:45		19:53 (WEA05)	04:59		
	16:17		17:11		18:06			20:04			20:58	23	20:16 (WEA05)	21:46		
5	08:40		08:04		07:05			06:50			05:43		19:54 (WEA05)	04:59		21:10 (WEA06)
	16:19		17:13		18:08			20:05			21:00	21	20:15 (WEA05)	21:47	3	21:13 (WEA06)
6	08:40		08:03		07:03			06:48			05:41		19:55 (WEA05)	04:58		21:09 (WEA06)
	16:20		17:15		18:10			20:07			21:02	18	20:13 (WEA05)	21:48	4	21:13 (WEA06)
7	08:39		08:01		07:00			06:45			05:39		19:56 (WEA05)	04:57		21:07 (WEA06)
	16:21		17:17		18:12			20:09			21:04	16	20:12 (WEA05)	21:49	7	21:14 (WEA06)
8	08:39		07:59		06:58			06:43			05:37		19:59 (WEA05)	04:57		21:07 (WEA06)
	16:23		17:19		18:14			20:11			21:05	11	20:10 (WEA05)	21:50	8	21:15 (WEA06)
9	08:38		07:57		06:56			06:40			05:35		20:02 (WEA05)	04:56		21:07 (WEA06)
	16:24		17:21		18:15			20:13			21:07	5	20:07 (WEA05)	21:51	9	21:16 (WEA06)
10	08:38		07:55		06:53			06:38			05:33			04:56		21:06 (WEA06)
	16:26		17:23		18:17			20:15			21:09			21:52	10	21:16 (WEA06)
11	08:37		07:53		06:51			06:36			05:32			04:55		21:06 (WEA06)
	16:27		17:25		18:19			20:16			21:11			21:53	11	21:17 (WEA06)
12	08:36		07:51		06:48			06:33			05:30			04:55		21:06 (WEA06)
	16:29		17:27		18:21			20:18			21:12			21:53	12	21:18 (WEA06)
13	08:36		07:49		06:46			06:31			05:28			04:54		21:05 (WEA06)
	16:30		17:29		18:23			20:20			21:14			21:54	13	21:18 (WEA06)
14	08:35		07:47		06:44			06:29			05:26			04:54		21:06 (WEA06)
	16:32		17:31		18:25			20:22			21:16			21:55	13	21:19 (WEA06)
15	08:34		07:45		06:41			06:26			05:25			04:54		21:06 (WEA06)
	16:33		17:33		18:27			20:24			21:18			21:55	14	21:20 (WEA06)
16	08:33		07:43		06:39			06:24			05:23			04:54		21:06 (WEA06)
	16:35		17:35		18:29			20:26			21:19			21:56	14	21:20 (WEA06)
17	08:32		07:41		06:36			06:22			05:21			04:54		21:06 (WEA06)
	16:37		17:37		18:30			20:27			21:21			21:56	15	21:21 (WEA06)
18	08:31		07:39		06:34			06:19			05:20			04:54		21:06 (WEA06)
	16:39		17:39		18:32			20:29			21:22			21:57	15	21:21 (WEA06)
19	08:30		07:37		06:31			06:17		20:00 (WEA05)	05:18			04:54		21:06 (WEA06)
	16:40		17:41		18:34			20:31	3	20:03 (WEA05)	21:24			21:57	15	21:21 (WEA06)
20	08:29		07:34		06:29			06:15		19:58 (WEA05)	05:17			04:54		21:06 (WEA06)
	16:42		17:43		18:36			20:33	6	20:04 (WEA05)	21:26			21:58	16	21:22 (WEA06)
21	08:27		07:32		06:27		18:09 (WEA09)	06:13		19:56 (WEA05)	05:15			04:54		21:06 (WEA06)
	16:44		17:44		18:38	2	18:11 (WEA09)	20:35	10	20:06 (WEA05)	21:27			21:58	16	21:22 (WEA06)
22	08:26		07:30		06:24		18:07 (WEA09)	06:10		19:55 (WEA05)	05:14			04:54		21:07 (WEA06)
	16:46		17:46		18:40	7	18:14 (WEA09)	20:37	13	20:08 (WEA05)	21:29			21:58	16	21:23 (WEA06)
23	08:25		07:28		06:22		18:05 (WEA09)	06:08		19:54 (WEA05)	05:12			04:54		21:07 (WEA06)
	16:48		17:48		18:42	10	18:15 (WEA09)	20:38	16	20:10 (WEA05)	21:30			21:58	15	21:22 (WEA06)
24	08:24		07:26		06:19		18:04 (WEA09)	06:06		19:54 (WEA05)	05:11			04:54		21:07 (WEA06)
	16:49		17:50		18:43	13	18:17 (WEA09)	20:40	18	20:12 (WEA05)	21:32			21:58	15	21:22 (WEA06)
25	08:22		07:23		06:17		18:03 (WEA09)	06:04		19:53 (WEA05)	05:10			04:55		21:08 (WEA06)
	16:51		17:52		18:45	16	18:19 (WEA09)	20:42	21	20:14 (WEA05)	21:33			21:58	15	21:23 (WEA06)
26	08:21		07:21		06:14		18:03 (WEA09)	06:02		19:53 (WEA05)	05:09			04:55		21:08 (WEA06)
	16:53		17:54		18:47	18	18:21 (WEA09)	20:44	22	20:15 (WEA05)	21:35			21:58	14	21:22 (WEA06)
27	08:19		07:19		06:12		18:02 (WEA09)	05:59		19:51 (WEA05)	05:07			04:56		21:09 (WEA06)
	16:55		17:56		18:49	20	18:22 (WEA09)	20:46	25	20:16 (WEA05)	21:36			21:58	14	21:23 (WEA06)
28	08:18		07:17		06:09		18:02 (WEA09)	05:57		19:51 (WEA05)	05:06			04:56		21:09 (WEA06)
	16:57		17:58		18:51	22	18:24 (WEA09)	20:48	27	20:18 (WEA05)	21:37			21:58	13	21:22 (WEA06)
29	08:16				07:07		19:01 (WEA09)	05:55		19:51 (WEA05)	05:05			04:57		21:10 (WEA06)
	16:59				19:53	24	19:25 (WEA09)	20:49	27	20:18 (WEA05)	21:39			21:58	13	21:23 (WEA06)
30	08:15				07:05		19:02 (WEA09)	05:53		19:51 (WEA05)	05:04			04:57		21:09 (WEA06)
	17:01				19:54	22	19:24 (WEA09)	20:51	27	20:18 (WEA05)	21:40			21:58	13	21:22 (WEA06)
31	08:13				07:02		19:03 (WEA09)				05:03					
	17:03				19:56	21	19:24 (WEA09)				21:41					
Sonnenscheinstunden	251		274		367			420			493			509		
astr.max.mögl.Beschattung						175			261			170			323	
Red.Sonnenscheinwahrsch.						0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,65			0,62			0,62			0,61	
Gesamte Reduktion						0,17			0,22			0,25			0,22	
Met.wahrsch.Beschattung						30			58			43			72	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP27 - Strother Heuweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober	November	Dezember
1	04:58		21:10 (WEA06)	05:38			06:31			07:24	07:22	08:17
	21:57	12	21:22 (WEA06)	21:22			20:16			19:03	16:53	16:09
2	04:59		21:11 (WEA06)	05:39			06:33			07:26	07:24	08:18
	21:57	11	21:22 (WEA06)	21:21			20:14			19:01	16:51	16:08
3	05:00		21:11 (WEA06)	05:41			06:35			07:28	07:26	08:20
	21:56	10	21:21 (WEA06)	21:19			20:12			18:58	16:49	16:08
4	05:00		21:12 (WEA06)	05:43		20:10 (WEA05)	06:37			07:30	07:28	08:21
	21:56	9	21:21 (WEA06)	21:17	9	20:19 (WEA05)	20:09			18:56	16:47	16:07
5	05:01		21:13 (WEA06)	05:44		20:07 (WEA05)	06:38			07:31	07:30	08:22
	21:55	7	21:20 (WEA06)	21:15	14	20:21 (WEA05)	20:07			18:53	16:45	16:06
6	05:02		21:15 (WEA06)	05:46		20:06 (WEA05)	06:40			07:33	07:32	08:24
	21:55	5	21:20 (WEA06)	21:13	17	20:23 (WEA05)	20:04			18:51	16:43	16:06
7	05:03		21:16 (WEA06)	05:48		20:04 (WEA05)	06:42			07:35	07:34	08:25
	21:54	3	21:19 (WEA06)	21:11	19	20:23 (WEA05)	20:02			18:49	16:41	16:05
8	05:04		21:18 (WEA06)	05:49		20:03 (WEA05)	06:44			07:37	07:35	08:26
	21:54	1	21:19 (WEA06)	21:09	21	20:24 (WEA05)	19:59			18:46	16:40	16:05
9	05:05			05:51		20:02 (WEA05)	06:45		19:00 (WEA09)	07:39	07:37	08:28
	21:53			21:07	24	20:26 (WEA05)	19:57	11	19:11 (WEA09)	18:44	16:38	16:05
10	05:06			05:53		20:01 (WEA05)	06:47		18:58 (WEA09)	07:40	07:39	08:29
	21:52			21:05	24	20:25 (WEA05)	19:55	15	19:13 (WEA09)	18:41	16:36	16:04
11	05:07			05:55		20:01 (WEA05)	06:49		18:55 (WEA09)	07:42	07:41	08:30
	21:51			21:03	25	20:26 (WEA05)	19:52	19	19:14 (WEA09)	18:39	16:34	16:04
12	05:08			05:56		20:00 (WEA05)	06:51		18:54 (WEA09)	07:44	07:43	08:31
	21:50			21:01	26	20:26 (WEA05)	19:50	21	19:15 (WEA09)	18:37	16:33	16:04
13	05:10			05:58		19:59 (WEA05)	06:52		18:53 (WEA09)	07:46	07:45	08:32
	21:49			20:59	27	20:26 (WEA05)	19:47	22	19:15 (WEA09)	18:34	16:31	16:04
14	05:11			06:00		19:59 (WEA05)	06:54		18:53 (WEA09)	07:48	07:47	08:33
	21:48			20:57	28	20:27 (WEA05)	19:45	23	19:16 (WEA09)	18:32	16:30	16:04
15	05:12			06:01		19:59 (WEA05)	06:56		18:51 (WEA09)	07:50	07:49	08:34
	21:47			20:55	26	20:25 (WEA05)	19:42	23	19:14 (WEA09)	18:30	16:28	16:04
16	05:13			06:03		19:59 (WEA05)	06:58		18:51 (WEA09)	07:52	07:51	08:35
	21:46			20:53	24	20:23 (WEA05)	19:40	21	19:12 (WEA09)	18:27	16:26	16:04
17	05:15			06:05		19:59 (WEA05)	06:59		18:51 (WEA09)	07:53	07:52	08:36
	21:45			20:51	23	20:22 (WEA05)	19:37	19	19:10 (WEA09)	18:25	16:25	16:04
18	05:16			06:07		19:59 (WEA05)	07:01		18:50 (WEA09)	07:55	07:54	08:37
	21:44			20:48	20	20:19 (WEA05)	19:35	17	19:07 (WEA09)	18:23	16:24	16:04
19	05:18			06:08		19:59 (WEA05)	07:03		18:51 (WEA09)	07:57	07:56	08:37
	21:42			20:46	18	20:17 (WEA05)	19:32	13	19:04 (WEA09)	18:21	16:22	16:04
20	05:19			06:10		20:00 (WEA05)	07:05		18:51 (WEA09)	07:59	07:58	08:38
	21:41			20:44	15	20:15 (WEA05)	19:30	11	19:02 (WEA09)	18:18	16:21	16:05
21	05:20			06:12		20:00 (WEA05)	07:06		18:52 (WEA09)	08:01	08:00	08:39
	21:40			20:42	13	20:13 (WEA05)	19:28	8	19:00 (WEA09)	18:16	16:19	16:05
22	05:22			06:14		20:01 (WEA05)	07:08		18:53 (WEA09)	08:03	08:02	08:39
	21:38			20:40	10	20:11 (WEA05)	19:25	4	18:57 (WEA09)	18:14	16:18	16:06
23	05:23			06:16		20:03 (WEA05)	07:10			08:05	08:03	08:40
	21:37			20:37	6	20:09 (WEA05)	19:23			18:12	16:17	16:06
24	05:25			06:17		20:04 (WEA05)	07:12			08:07	08:05	08:40
	21:35			20:35	2	20:06 (WEA05)	19:20			18:10	16:16	16:07
25	05:26			06:19			07:13			07:09	08:07	08:40
	21:34			20:33			19:18			17:07	16:15	16:07
26	05:28			06:21			07:15			07:10	08:08	08:41
	21:32			20:30			19:15			17:05	16:14	16:08
27	05:29			06:23			07:17			07:12	08:10	08:41
	21:31			20:28			19:13			17:03	16:13	16:09
28	05:31			06:24			07:19			07:14	08:12	08:41
	21:29			20:26			19:10			17:01	16:12	16:10
29	05:33			06:26			07:21			07:16	08:13	08:41
	21:28			20:23			19:08			16:59	16:11	16:11
30	05:34			06:28			07:22			07:18	08:15	08:41
	21:26			20:21			19:05			16:57	16:10	16:12
31	05:36			06:30						07:20		08:41
	21:24			20:19						16:55		16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		58			391			227				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,61			0,62			0,65				
Gesamte Reduktion		0,22			0,25			0,22				
Met.wahrsch.Beschattung		13			97			49				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP28 - Strother Heuweg 9, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		07:00		18:59 (WEA09)		05:51	
	16:14		17:05		18:00		19:58	18	19:17 (WEA09)	29	20:53	
2	08:41		08:10		07:12		06:57		19:01 (WEA09)		05:49	
	16:15		17:07		18:02		20:00	14	19:15 (WEA09)	29	20:55	
3	08:41		08:08		07:10		06:55		19:04 (WEA09)		05:47	
	16:16		17:09		18:04		20:02	7	19:11 (WEA09)	28	20:57	
4	08:41		08:06		07:07		06:52				05:45	
	16:17		17:11		18:06		20:04			26	20:58	
5	08:40		08:04		07:05		06:50				05:43	
	16:19		17:13		18:08		20:05			25	21:00	
6	08:40		08:03		07:03		06:48				05:41	
	16:20		17:15		18:10		20:07			23	21:02	
7	08:40		08:01		07:00		06:45				05:39	
	16:21		17:17		18:12		20:09			22	21:04	
8	08:39		07:59		06:58		06:43				05:37	
	16:23		17:19		18:14		20:11			20	21:05	
9	08:38		07:57		06:56		06:40				05:35	
	16:24		17:21		18:15		20:13			17	21:07	
10	08:38		07:55		06:53		06:38				05:33	
	16:26		17:23		18:17		20:15			13	21:09	
11	08:37		07:53		06:51		06:36				05:32	
	16:27		17:25		18:19		20:16			8	21:11	
12	08:36		07:51		06:48		06:33				05:30	
	16:29		17:27		18:21		20:18				21:12	
13	08:36		07:49		06:46		06:31				05:28	
	16:30		17:29		18:23		20:20				21:14	
14	08:35		07:47		06:44		06:29				05:26	
	16:32		17:31		18:25		20:22				21:16	
15	08:34		07:45		06:41		06:26				05:25	
	16:33		17:33		18:27		20:24				21:18	
16	08:33		07:43		06:39		06:24				05:23	
	16:35		17:35		18:29		20:26				21:19	
17	08:32		07:41		06:36		06:22				05:21	
	16:37		17:37		18:30		20:27				21:21	
18	08:31		07:39		06:34		06:19				05:20	
	16:39		17:39		18:32		20:29				21:22	
19	08:30		07:37		06:31		06:17		20:01 (WEA05)		05:18	
	16:40		17:41		18:34	2	20:31	2	20:03 (WEA05)		21:24	
20	08:29		07:34		06:29		06:15		19:58 (WEA05)		05:17	
	16:42		17:43		18:36	6	20:33	6	20:04 (WEA05)		21:26	
21	08:27		07:32		06:27		06:13		19:56 (WEA05)		05:15	
	16:44		17:45		18:38	9	20:35	10	20:06 (WEA05)		21:27	
22	08:26		07:30		06:24		06:10		19:55 (WEA05)		05:14	
	16:46		17:46		18:40	13	20:37	13	20:08 (WEA05)		21:29	
23	08:25		07:28		06:22		06:08		19:54 (WEA05)		05:12	
	16:48		17:48		18:42	16	20:38	16	20:10 (WEA05)		21:30	
24	08:24		07:26		06:19		06:06		19:53 (WEA05)		05:11	
	16:49		17:50		18:43	18	20:40	19	20:12 (WEA05)		21:32	
25	08:22		07:23		06:17		06:04		19:52 (WEA05)		05:10	
	16:51		17:52		18:45	22	20:42	22	20:14 (WEA05)		21:33	
26	08:21		07:21		06:14		06:02		19:51 (WEA05)		05:09	
	16:53		17:54		18:47	24	20:44	24	20:15 (WEA05)		21:35	
27	08:19		07:19		06:12		05:59		19:50 (WEA05)		05:07	
	16:55		17:56		18:49	25	20:46	26	20:16 (WEA05)		21:36	
28	08:18		07:17		06:09		05:57		19:50 (WEA05)		05:06	
	16:57		17:58		18:51	25	20:48	28	20:18 (WEA05)		21:37	
29	08:16				07:07		05:55		19:49 (WEA05)		05:05	
	16:59				19:53	24	20:49	30	20:19 (WEA05)		21:39	
30	08:15				07:05		05:53		19:49 (WEA05)		05:04	
	17:01				19:54	22	20:51	29	20:18 (WEA05)		21:40	
31	08:13				07:02						05:03	
	17:03				19:56	20					21:41	
Sonnenscheinstunden	251		274		367		420		493		509	
astr.max.mögl.Beschattung						226		264		240		3
Red.Sonnenscheinwahrsch.						0,28		0,37		0,43		0,39
Reduktion Betriebsdauer						0,95		0,95		0,95		0,95
Reduktion Windrichtung						0,65		0,62		0,62		0,60
Gesamte Reduktion						0,17		0,22		0,25		0,22
Met.wahrsch.Beschattung						39		58		60		1

	Juni		
1	19:50 (WEA05)	05:02	
	20:19 (WEA05)	21:43	
2	19:50 (WEA05)	05:01	
	20:19 (WEA05)	21:44	
3	19:50 (WEA05)	05:00	
	20:18 (WEA05)	21:45	
4	19:51 (WEA05)	04:59	
	20:17 (WEA05)	21:46	
5	19:51 (WEA05)	04:59	
	20:16 (WEA05)	21:47	
6	19:52 (WEA05)	04:58	
	20:15 (WEA05)	21:48	
7	19:52 (WEA05)	04:57	
	20:14 (WEA05)	21:49	
8	19:54 (WEA05)	04:57	
	20:14 (WEA05)	21:50	
9	19:55 (WEA05)	04:56	
	20:12 (WEA05)	21:51	
10	19:57 (WEA05)	04:56	
	20:10 (WEA05)	21:52	
11	20:00 (WEA05)	04:55	
	20:08 (WEA05)	21:53	
12		04:55	
		21:53	
13		04:54	
		21:54	
14		04:54	
		21:55	
15		04:54	
		21:55	
16		04:54	
		21:56	
17		04:54	
		21:56	
18		04:54	
		21:57	
19		04:54	
		21:57	
20		04:54	21:21 (WEA06)
		21:58	1 21:22 (WEA06)
21		04:54	21:21 (WEA06)
		21:58	1 21:22 (WEA06)
22		04:54	21:22 (WEA06)
		21:58	1 21:23 (WEA06)
23		04:54	
		21:58	
24		04:54	
		21:58	
25		04:55	
		21:58	
26		04:55	
		21:58	
27		04:56	
		21:58	
28		04:56	
		21:58	
29		04:57	
		21:58	
30		04:57	
		21:58	
31			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP28 - Strother Heuweg 9, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September			Oktober		November	Dezember
1	04:58		05:38			06:31			07:24		07:22	08:17
	21:57		21:22			20:16			19:03		16:53	16:09
2	04:59		05:39		20:08 (WEA05)	06:33			07:26		07:24	08:18
	21:57		21:21	10	20:18 (WEA05)	20:14			19:01		16:51	16:08
3	05:00		05:41		20:06 (WEA05)	06:35			07:28		07:26	08:20
	21:56		21:19	15	20:21 (WEA05)	20:12			18:58		16:49	16:08
4	05:00		05:43		20:05 (WEA05)	06:37			07:30		07:28	08:21
	21:56		21:17	18	20:23 (WEA05)	20:09			18:56		16:47	16:07
5	05:01		05:44		20:03 (WEA05)	06:38			07:31		07:30	08:22
	21:55		21:15	21	20:24 (WEA05)	20:07			18:53		16:45	16:06
6	05:02		05:46		20:02 (WEA05)	06:40			07:33		07:32	08:24
	21:55		21:13	23	20:25 (WEA05)	20:04			18:51		16:43	16:06
7	05:03		05:48		20:01 (WEA05)	06:42			07:35		07:34	08:25
	21:54		21:11	24	20:25 (WEA05)	20:02			18:49		16:41	16:05
8	05:04		05:49		20:00 (WEA05)	06:44			07:37		07:35	08:26
	21:54		21:09	26	20:26 (WEA05)	19:59			18:46		16:40	16:05
9	05:05		05:51		20:00 (WEA05)	06:45		18:58 (WEA09)	07:39		07:37	08:28
	21:53		21:07	27	20:27 (WEA05)	19:57	7	19:05 (WEA09)	18:44		16:38	16:05
10	05:06		05:53		19:59 (WEA05)	06:47		18:55 (WEA09)	07:40		07:39	08:29
	21:52		21:05	28	20:27 (WEA05)	19:55	13	19:08 (WEA09)	18:41		16:36	16:04
11	05:07		05:55		19:59 (WEA05)	06:49		18:52 (WEA09)	07:42		07:41	08:30
	21:51		21:03	28	20:27 (WEA05)	19:52	17	19:09 (WEA09)	18:39		16:34	16:04
12	05:08		05:56		19:58 (WEA05)	06:51		18:50 (WEA09)	07:44		07:43	08:31
	21:50		21:01	29	20:27 (WEA05)	19:50	20	19:10 (WEA09)	18:37		16:33	16:04
13	05:10		05:58		19:58 (WEA05)	06:52		18:49 (WEA09)	07:46		07:45	08:32
	21:49		20:59	29	20:27 (WEA05)	19:47	22	19:11 (WEA09)	18:34		16:31	16:04
14	05:11		06:00		19:58 (WEA05)	06:54		18:48 (WEA09)	07:48		07:47	08:33
	21:48		20:57	29	20:27 (WEA05)	19:45	24	19:12 (WEA09)	18:32		16:30	16:04
15	05:12		06:02		19:57 (WEA05)	06:56		18:47 (WEA09)	07:50		07:49	08:34
	21:47		20:55	28	20:25 (WEA05)	19:42	24	19:11 (WEA09)	18:30		16:28	16:04
16	05:13		06:03		19:58 (WEA05)	06:58		18:46 (WEA09)	07:52		07:51	08:35
	21:46		20:53	25	20:23 (WEA05)	19:40	26	19:12 (WEA09)	18:27		16:26	16:04
17	05:15		06:05		19:58 (WEA05)	06:59		18:46 (WEA09)	07:53		07:52	08:36
	21:45		20:51	24	20:22 (WEA05)	19:37	24	19:10 (WEA09)	18:25		16:25	16:04
18	05:16		06:07		19:58 (WEA05)	07:01		18:45 (WEA09)	07:55		07:54	08:37
	21:44		20:48	21	20:19 (WEA05)	19:35	22	19:07 (WEA09)	18:23		16:24	16:04
19	05:18		06:09		19:58 (WEA05)	07:03		18:45 (WEA09)	07:57		07:56	08:37
	21:42		20:46	19	20:17 (WEA05)	19:33	19	19:04 (WEA09)	18:21		16:22	16:04
20	05:19		06:10		19:59 (WEA05)	07:05		18:45 (WEA09)	07:59		07:58	08:38
	21:41		20:44	16	20:15 (WEA05)	19:30	17	19:02 (WEA09)	18:18		16:21	16:05
21	05:20		06:12		19:59 (WEA05)	07:06		18:46 (WEA09)	08:01		08:00	08:39
	21:40		20:42	14	20:13 (WEA05)	19:28	14	19:00 (WEA09)	18:16		16:19	16:05
22	05:22		06:14		20:01 (WEA05)	07:08		18:46 (WEA09)	08:03		08:02	08:39
	21:38		20:40	10	20:11 (WEA05)	19:25	11	18:57 (WEA09)	18:14		16:18	16:06
23	05:23		06:16		20:03 (WEA05)	07:10		18:47 (WEA09)	08:05		08:03	08:40
	21:37		20:37	6	20:09 (WEA05)	19:23	7	18:54 (WEA09)	18:12		16:17	16:06
24	05:25		06:17		20:05 (WEA05)	07:12		18:49 (WEA09)	08:07		08:05	08:40
	21:35		20:35	1	20:06 (WEA05)	19:20	3	18:52 (WEA09)	18:10		16:16	16:07
25	05:26		06:19			07:13			07:09		08:07	08:40
	21:34		20:33			19:18			17:07		16:15	16:07
26	05:28		06:21			07:15			07:10		08:08	08:41
	21:32		20:30			19:15			17:05		16:14	16:08
27	05:29		06:23			07:17			07:12		08:10	08:41
	21:31		20:28			19:13			17:03		16:13	16:09
28	05:31		06:24			07:19			07:14		08:12	08:41
	21:29		20:26			19:10			17:01		16:12	16:10
29	05:33		06:26			07:21			07:16		08:13	08:41
	21:28		20:23			19:08			16:59		16:11	16:11
30	05:34		06:28			07:22			07:18		08:15	08:41
	21:26		20:21			19:05			16:57		16:10	16:12
31	05:36		06:30						07:20			08:41
	21:24		20:19						16:55			16:13
Sonnenscheinstunden	511		459			382			329		260	234
astr.max.mögl.Beschattung				471			270					
Red.Sonnenscheinwahrsch.				0,42			0,35					
Reduktion Betriebsdauer				0,95			0,95					
Reduktion Windrichtung				0,62			0,65					
Gesamte Reduktion				0,25			0,22					
Met.wahrsch.Beschattung				117			58					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP29 - Birkenweg 11, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP30 - Pappelweg 7, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni		Juli		August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02		04:58		05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43		21:57	10	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01		04:59		05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44		21:57	9	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00		05:00		05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45		21:56	9	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	21:09 (WEA06)	05:00		05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	2 21:11 (WEA06)	21:56	8	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	21:09 (WEA06)	05:01		05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	4 21:13 (WEA06)	21:55	6	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	21:08 (WEA06)	05:02		05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	5 21:13 (WEA06)	21:55	5	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	21:08 (WEA06)	05:03		05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	6 21:14 (WEA06)	21:54	4	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	21:08 (WEA06)	05:04		05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	7 21:15 (WEA06)	21:53	3	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	21:08 (WEA06)	05:05		05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	8 21:16 (WEA06)	21:53	1	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	21:08 (WEA06)	05:06		05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	8 21:16 (WEA06)	21:52		21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	21:08 (WEA06)	05:07		05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	9 21:17 (WEA06)	21:51		21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	21:08 (WEA06)	05:08		05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	10 21:18 (WEA06)	21:50		21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	21:07 (WEA06)	05:10		05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	11 21:18 (WEA06)	21:49		20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	21:08 (WEA06)	05:11		06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	11 21:19 (WEA06)	21:48		20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	21:08 (WEA06)	05:12		06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	12 21:20 (WEA06)	21:47		20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	21:08 (WEA06)	05:13		06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	12 21:20 (WEA06)	21:46		20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	21:08 (WEA06)	05:15		06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	13 21:21 (WEA06)	21:45		20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	21:08 (WEA06)	05:16		06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	13 21:21 (WEA06)	21:44		20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	21:08 (WEA06)	05:18		06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	13 21:21 (WEA06)	21:42		20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	21:08 (WEA06)	05:19		06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	13 21:21 (WEA06)	21:41		20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	21:08 (WEA06)	05:20		06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	14 21:22 (WEA06)	21:40		20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	21:09 (WEA06)	05:22		06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	14 21:23 (WEA06)	21:38		20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	21:09 (WEA06)	05:23		06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	13 21:22 (WEA06)	21:37		20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	21:09 (WEA06)	05:25		06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	13 21:22 (WEA06)	21:35		20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	21:10 (WEA06)	05:26		06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	13 21:23 (WEA06)	21:34		20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	21:10 (WEA06)	05:28		06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	12 21:22 (WEA06)	21:32		20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	21:11 (WEA06)	05:29		06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	12 21:23 (WEA06)	21:31		20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	21:11 (WEA06)	05:31		06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	11 21:22 (WEA06)	21:29		20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	21:11 (WEA06)	05:33		06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	12 21:23 (WEA06)	21:28		20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	21:11 (WEA06)	05:34		06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	11 21:22 (WEA06)	21:26		20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03			05:36		06:30		07:20		08:41
	17:03		19:56		21:41			21:24		20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509		511		459	382	329	260	234
astr.max.mogl.Beschattung						282		55						
Red.Sonnenscheinwahrsch.						0,39		0,38						
Reduktion Betriebsdauer						0,95		0,95						
Reduktion Windrichtung						0,61		0,61						
Gesamte Reduktion						0,22		0,22						
Met.wahrsch.Beschattung						63		12						

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP31 - Jochensweg 8, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai			Juni			Juli			August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51			05:02			20:43 (WEA06)	04:58		20:50 (WEA06)	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53			21:43	25		21:08 (WEA06)	21:57	24	21:14 (WEA06)	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49			05:01			20:44 (WEA06)	04:59		20:50 (WEA06)	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55			21:44	26		21:10 (WEA06)	21:57	25	21:15 (WEA06)	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47			05:00			20:43 (WEA06)	05:00		20:50 (WEA06)	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57			21:45	26		21:09 (WEA06)	21:56	24	21:14 (WEA06)	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45			04:59			20:43 (WEA06)	05:00		20:50 (WEA06)	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58			21:46	26		21:09 (WEA06)	21:56	25	21:15 (WEA06)	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43			04:59			20:44 (WEA06)	05:01		20:50 (WEA06)	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00			21:47	26		21:10 (WEA06)	21:55	25	21:15 (WEA06)	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41			04:58			20:44 (WEA06)	05:02		20:50 (WEA06)	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02			21:48	25		21:09 (WEA06)	21:55	26	21:16 (WEA06)	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39			04:57			20:44 (WEA06)	05:03		20:51 (WEA06)	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04			21:49	25		21:09 (WEA06)	21:54	25	21:16 (WEA06)	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37			04:57			20:45 (WEA06)	05:04		20:51 (WEA06)	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05			21:50	25		21:10 (WEA06)	21:53	25	21:16 (WEA06)	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35			04:56			20:45 (WEA06)	05:05		20:51 (WEA06)	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07			21:51	25		21:10 (WEA06)	21:53	26	21:17 (WEA06)	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33			04:55			20:45 (WEA06)	05:06		20:51 (WEA06)	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09			21:52	25		21:10 (WEA06)	21:52	26	21:17 (WEA06)	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32			04:55			20:46 (WEA06)	05:07		20:51 (WEA06)	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11			21:53	24		21:10 (WEA06)	21:51	26	21:17 (WEA06)	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30			04:55			20:46 (WEA06)	05:08		20:51 (WEA06)	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12			21:53	24		21:10 (WEA06)	21:50	25	21:16 (WEA06)	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28			04:54			20:46 (WEA06)	05:10		20:51 (WEA06)	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14			21:54	24		21:10 (WEA06)	21:49	24	21:15 (WEA06)	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26			04:54			20:46 (WEA06)	05:11		20:51 (WEA06)	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16			21:55	24		21:10 (WEA06)	21:48	23	21:14 (WEA06)	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25			04:54			20:47 (WEA06)	05:12		20:51 (WEA06)	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17			21:55	23		21:10 (WEA06)	21:47	22	21:13 (WEA06)	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23			04:54			20:47 (WEA06)	05:13		20:51 (WEA06)	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19			21:56	23		21:10 (WEA06)	21:46	21	21:12 (WEA06)	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21			04:54			20:48 (WEA06)	05:15		20:52 (WEA06)	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21			21:56	23		21:11 (WEA06)	21:45	19	21:11 (WEA06)	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20		20:47 (WEA06)	04:54			20:48 (WEA06)	05:16		20:52 (WEA06)	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	3	20:50 (WEA06)	21:57	23		21:11 (WEA06)	21:44	18	21:10 (WEA06)	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18		20:45 (WEA06)	04:54			20:48 (WEA06)	05:18		20:52 (WEA06)	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	6	20:51 (WEA06)	21:57	23		21:11 (WEA06)	21:42	17	21:09 (WEA06)	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17		20:45 (WEA06)	04:54			20:48 (WEA06)	05:19		20:53 (WEA06)	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	8	20:53 (WEA06)	21:57	23		21:11 (WEA06)	21:41	15	21:08 (WEA06)	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15		20:44 (WEA06)	04:54			20:48 (WEA06)	05:20		20:54 (WEA06)	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	11	20:55 (WEA06)	21:58	23		21:11 (WEA06)	21:40	13	21:07 (WEA06)	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14		20:44 (WEA06)	04:54			20:49 (WEA06)	05:22		20:54 (WEA06)	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	12	20:56 (WEA06)	21:58	23		21:12 (WEA06)	21:38	11	21:05 (WEA06)	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12		20:43 (WEA06)	04:54			20:49 (WEA06)	05:23		20:55 (WEA06)	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	14	20:57 (WEA06)	21:58	23		21:12 (WEA06)	21:37	9	21:04 (WEA06)	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11		20:43 (WEA06)	04:54			20:49 (WEA06)	05:25		20:56 (WEA06)	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	15	20:58 (WEA06)	21:58	23		21:12 (WEA06)	21:35	7	21:03 (WEA06)	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10		20:43 (WEA06)	04:55			20:50 (WEA06)	05:26		20:56 (WEA06)	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	17	21:00 (WEA06)	21:58	23		21:13 (WEA06)	21:34	5	21:01 (WEA06)	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09		20:43 (WEA06)	04:55			20:49 (WEA06)	05:28		20:58 (WEA06)	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	18	21:01 (WEA06)	21:58	23		21:12 (WEA06)	21:32	2	21:00 (WEA06)	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07		20:43 (WEA06)	04:56			20:50 (WEA06)	05:29			06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	19	21:02 (WEA06)	21:58	23		21:13 (WEA06)	21:31			20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06		20:43 (WEA06)	04:56			20:50 (WEA06)	05:31			06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21	21:04 (WEA06)	21:58	23		21:13 (WEA06)	21:29			20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05		20:43 (WEA06)	04:57			20:50 (WEA06)	05:33			06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	22	21:05 (WEA06)	21:58	24		21:14 (WEA06)	21:28			20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04		20:43 (WEA06)	04:57			20:50 (WEA06)	05:34			06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	23	21:06 (WEA06)	21:58	23		21:13 (WEA06)	21:26			20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		20:43 (WEA06)					05:36			06:30		07:20		08:41
	17:03		19:56		21:41	24	21:07 (WEA06)					21:24			20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493			509				511			459	382	329	260	234
astr.max.mögl.Beschattung						213			719				508						
Red.Sonnenscheinwahrsch.						0,43			0,39				0,38						
Reduktion Betriebsdauer						0,95			0,95				0,95						
Reduktion Windrichtung						0,62			0,62				0,62						
Gesamte Reduktion						0,25			0,23				0,22						
Met.wahrsch.Beschattung						54			163				113						

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP32 - Driftweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		17:30 (WEA08)		07:00		19:03 (WEA02)	
	16:14		17:05		18:00	3	17:33 (WEA08)		19:58	16	19:19 (WEA02)	
2	08:41		08:10		07:12		17:26 (WEA08)		06:57		19:05 (WEA02)	
	16:15		17:07		18:02	9	17:35 (WEA08)		20:00	12	19:17 (WEA02)	
3	08:41		08:08		07:10		17:24 (WEA08)		06:55		19:08 (WEA02)	
	16:16		17:09		18:04	13	17:37 (WEA08)		20:02	4	19:12 (WEA02)	
4	08:41		08:06		07:07		17:22 (WEA08)		06:53			
	16:17		17:11		18:06	17	17:39 (WEA08)		20:04			
5	08:40		08:05		07:05		17:20 (WEA08)		06:50			
	16:19		17:13		18:08	21	17:41 (WEA08)		20:06			
6	08:40		08:03		07:03		17:20 (WEA08)		06:48			
	16:20		17:15		18:10	23	17:43 (WEA08)		20:07			
7	08:40		08:01		07:00		17:18 (WEA08)		06:45			
	16:21		17:17		18:12	26	17:44 (WEA08)		20:09			
8	08:39		07:59		06:58		17:18 (WEA08)		06:43			
	16:23		17:19		18:14	29	17:47 (WEA08)		20:11			
9	08:38		07:57		06:56		17:18 (WEA08)		06:41			
	16:24		17:21		18:15	31	17:49 (WEA08)		20:13			
10	08:38		07:55		06:53		17:17 (WEA08)		06:38			
	16:26		17:23		18:17	31	17:48 (WEA08)		20:15			
11	08:37		07:53		06:51		17:17 (WEA08)		06:36		19:45 (WEA03)	
	16:27		17:25		18:19	32	17:49 (WEA08)		20:17	5	19:50 (WEA03)	
12	08:36		07:51		06:48		17:16 (WEA08)		06:33		19:41 (WEA03)	
	16:29		17:27		18:21	32	17:48 (WEA08)		20:18	10	19:51 (WEA03)	
13	08:36		07:49		06:46		17:16 (WEA08)		06:31		19:24 (WEA09)	
	16:30		17:29		18:23	32	17:48 (WEA08)		20:20	25	19:53 (WEA03)	
14	08:35		07:47		06:44		17:16 (WEA08)		06:29		19:18 (WEA09)	
	16:32		17:31		18:25	30	17:46 (WEA08)		20:22	37	19:55 (WEA03)	
15	08:34		07:45		06:41		17:17 (WEA08)		06:26		19:13 (WEA09)	
	16:34		17:33		18:27	29	17:46 (WEA08)		20:24	43	19:56 (WEA03)	
16	08:33		07:43		06:39		17:17 (WEA08)		06:24		19:11 (WEA09)	
	16:35		17:35		18:29	27	17:44 (WEA08)		20:26	47	19:58 (WEA03)	
17	08:32		07:41		06:36		17:18 (WEA08)		06:22		19:08 (WEA09)	
	16:37		17:37		18:30	25	17:43 (WEA08)		20:28	52	20:00 (WEA03)	
18	08:31		07:39		06:34		17:20 (WEA08)		06:19		19:06 (WEA09)	
	16:39		17:39		18:32	22	17:42 (WEA08)		20:29	56	20:02 (WEA03)	
19	08:30		07:37		06:32		17:21 (WEA08)		06:17		19:03 (WEA09)	
	16:40		17:41		18:34	18	17:39 (WEA08)		20:31	60	20:03 (WEA03)	
20	08:29		07:35		06:29		17:24 (WEA08)		06:15		19:02 (WEA09)	
	16:42		17:43		18:36	13	17:37 (WEA08)		20:33	61	20:03 (WEA03)	
21	08:27		07:32		06:27		18:07 (WEA02)		06:13		19:00 (WEA09)	
	16:44		17:45		18:38	4	18:11 (WEA02)		20:35	63	20:03 (WEA03)	
22	08:26		07:30		06:24		18:05 (WEA02)		06:10		18:59 (WEA09)	
	16:46		17:47		18:40	9	18:14 (WEA02)		20:37	64	20:03 (WEA03)	
23	08:25		07:28		06:22		18:04 (WEA02)		06:08		18:58 (WEA09)	
	16:48		17:48		18:42	11	18:15 (WEA02)		20:39	64	20:02 (WEA03)	
24	08:24		07:26		06:19		18:03 (WEA02)		06:06		18:57 (WEA09)	
	16:49		17:50		18:43	14	18:17 (WEA02)		20:40	65	20:02 (WEA03)	
25	08:22		07:24		06:17		18:02 (WEA02)		06:04		18:56 (WEA09)	
	16:51		17:52		18:45	17	18:19 (WEA02)		20:42	65	20:01 (WEA03)	
26	08:21		07:21		06:14		18:02 (WEA02)		06:02		18:55 (WEA09)	
	16:53		17:54		18:47	19	18:21 (WEA02)		20:44	65	20:00 (WEA09)	
27	08:19		07:19		06:12		18:01 (WEA02)		05:59		18:54 (WEA09)	
	16:55		17:56		18:49	21	18:22 (WEA02)		20:46	66	20:00 (WEA09)	
28	08:18		07:17		06:10		18:01 (WEA02)		05:57		18:53 (WEA09)	
	16:57		17:58		18:51	23	18:24 (WEA02)		20:48	68	20:01 (WEA09)	
29	08:16				07:07		19:02 (WEA02)		05:55		18:53 (WEA09)	
	16:59				19:53	22	19:24 (WEA02)		20:49	68	20:01 (WEA09)	
30	08:15				07:05		19:01 (WEA02)		05:53		18:52 (WEA09)	
	17:01				19:54	21	19:22 (WEA02)		20:51	70	20:02 (WEA09)	
31	08:13				07:02		19:02 (WEA02)					
	17:03				19:56	19	19:21 (WEA02)					
Sonnenscheinstunden	251		274		367				420		493	
astr.max.mögl.Beschattung						643			1086		3256	
Red.Sonnenscheinwahrsch.						0,28			0,37		0,43	
Reduktion Betriebsdauer						0,95			0,95		0,95	
Reduktion Windrichtung						0,65			0,63		0,63	
Gesamte Reduktion						0,17			0,22		0,25	
Met.wahrsch.Beschattung						110			240		828	

	Juni		
1	18:51 (WEA09)		18:55 (WEA09)
	20:02 (WEA09)	109	20:46 (WEA04)
2	18:51 (WEA09)		18:57 (WEA09)
	20:02 (WEA09)	107	20:47 (WEA04)
3	18:50 (WEA09)		18:57 (WEA09)
	20:02 (WEA09)	107	20:47 (WEA04)
4	18:50 (WEA09)		18:57 (WEA09)
	20:28 (WEA04)	105	20:46 (WEA04)
5	18:49 (WEA09)		18:58 (WEA09)
	20:30 (WEA04)	105	20:47 (WEA04)
6	18:49 (WEA09)		18:58 (WEA09)
	20:31 (WEA04)	104	20:47 (WEA04)
7	18:48 (WEA09)		18:59 (WEA09)
	20:33 (WEA04)	103	20:47 (WEA04)
8	18:49 (WEA09)		18:59 (WEA09)
	20:35 (WEA04)	102	20:47 (WEA04)
9	18:49 (WEA09)		19:00 (WEA09)
	20:36 (WEA04)	102	20:47 (WEA04)
10	18:48 (WEA09)		19:00 (WEA09)
	20:38 (WEA04)	101	20:47 (WEA04)
11	18:49 (WEA09)		19:01 (WEA09)
	20:40 (WEA04)	99	20:47 (WEA04)
12	18:49 (WEA09)		19:02 (WEA09)
	20:41 (WEA04)	99	20:47 (WEA04)
13	18:48 (WEA09)		19:01 (WEA09)
	20:42 (WEA04)	99	20:47 (WEA04)
14	18:49 (WEA09)		19:02 (WEA09)
	20:43 (WEA04)	97	20:47 (WEA04)
15	18:49 (WEA09)		19:02 (WEA09)
	20:43 (WEA04)	97	20:47 (WEA04)
16	18:49 (WEA09)		19:03 (WEA09)
	20:44 (WEA04)	96	20:47 (WEA04)
17	18:49 (WEA09)		19:03 (WEA09)
	20:44 (WEA04)	97	20:48 (WEA04)
18	18:50 (WEA09)		19:03 (WEA09)
	20:45 (WEA04)	97	20:48 (WEA04)
19	18:50 (WEA09)		19:04 (WEA09)
	20:45 (WEA04)	96	20:48 (WEA04)
20	18:50 (WEA09)		19:04 (WEA09)
	20:45 (WEA04)	96	20:48 (WEA04)
21	18:51 (WEA09)		19:04 (WEA09)
	20:45 (WEA04)	96	20:48 (WEA04)
22	18:51 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	96	20:49 (WEA04)
23	18:51 (WEA09)		19:05 (WEA09)
	20:45 (WEA04)	96	20:49 (WEA04)
24	18:52 (WEA09)		19:04 (WEA09)
	20:46 (WEA04)	97	20:49 (WEA04)
25	18:52 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	97	20:50 (WEA04)
26	18:53 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	97	20:50 (WEA04)
27	18:53 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	97	20:50 (WEA04)
28	18:54 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	97	20:50 (WEA04)
29	18:54 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	99	20:51 (WEA04)
30	18:55 (WEA09)		19:05 (WEA09)
	20:46 (WEA04)	99	20:51 (WEA04)
	18:55 (WEA09)		
	20:46 (WEA04)		
	509		
	2989		
	0,39		
	0,95		
	0,62		
	0,23		
	683		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP32 - Driftweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

Juli		August		September		Oktober		November	Dezember
1 | 04:58		19:05 (WEA09) | 05:38		18:59 (WEA09) | 06:31		19:44 (WEA03) | 07:24		17:55 (WEA08) | 07:22	| 08:17
| 21:57	99	20:51 (WEA04) | 21:22	110	20:51 (WEA04) | 20:16	4	19:48 (WEA03) | 19:03	31	18:26 (WEA08) | 16:53	| 16:09
2 | 04:59		19:05 (WEA09) | 05:39		18:59 (WEA09) | 06:33			| 07:26		17:55 (WEA08) | 07:24	| 08:18
| 21:57	100	20:52 (WEA04) | 21:21	109	20:50 (WEA04) | 20:14			| 19:01	32	18:27 (WEA08) | 16:51	| 16:08
3 | 05:00		19:05 (WEA09) | 05:41		18:59 (WEA09) | 06:35			| 07:28		17:54 (WEA08) | 07:26	| 08:20
| 21:57	100	20:51 (WEA04) | 21:19	105	20:48 (WEA04) | 20:12			| 18:58	32	18:26 (WEA08) | 16:49	| 16:08
4 | 05:00		19:05 (WEA09) | 05:43		18:59 (WEA09) | 06:37			| 07:30		17:54 (WEA08) | 07:28	| 08:21
| 21:56	102	20:52 (WEA04) | 21:17	102	20:46 (WEA04) | 20:09			| 18:56	32	18:26 (WEA08) | 16:47	| 16:07
5 | 05:01		19:05 (WEA09) | 05:44		18:58 (WEA09) | 06:38			| 07:31		17:54 (WEA08) | 07:30	| 08:22
| 21:56	102	20:52 (WEA04) | 21:15	99	20:44 (WEA04) | 20:07			| 18:53	31	18:25 (WEA08) | 16:45	| 16:06
6 | 05:02		19:05 (WEA09) | 05:46		18:59 (WEA09) | 06:40			| 07:33		17:55 (WEA08) | 07:32	| 08:24
| 21:55	104	20:53 (WEA04) | 21:13	96	20:43 (WEA04) | 20:04			| 18:51	28	18:23 (WEA08) | 16:43	| 16:06
7 | 05:03		19:05 (WEA09) | 05:48		18:58 (WEA09) | 06:42			| 07:35		17:55 (WEA08) | 07:34	| 08:25
| 21:54	103	20:53 (WEA04) | 21:11	92	20:40 (WEA04) | 20:02			| 18:49	25	18:20 (WEA08) | 16:42	| 16:05
8 | 05:04		19:04 (WEA09) | 05:49		18:59 (WEA09) | 06:44			| 07:37		17:55 (WEA08) | 07:36	| 08:26
| 21:54	106	20:54 (WEA04) | 21:09	88	20:39 (WEA04) | 20:00			| 18:46	22	18:17 (WEA08) | 16:40	| 16:05
9 | 05:05		19:04 (WEA09) | 05:51		18:59 (WEA09) | 06:45		19:03 (WEA02) | 07:39		17:56 (WEA08) | 07:37	| 08:28
| 21:53	106	20:54 (WEA04) | 21:07	81	20:37 (WEA04) | 19:57	3	19:06 (WEA02) | 18:44	19	18:15 (WEA08) | 16:38	| 16:05
10 | 05:06		19:04 (WEA09) | 05:53		18:59 (WEA09) | 06:47		18:58 (WEA02) | 07:41		17:57 (WEA08) | 07:39	| 08:29
| 21:52	107	20:54 (WEA04) | 21:05	72	20:11 (WEA09) | 19:55	12	19:10 (WEA02) | 18:41	15	18:12 (WEA08) | 16:36	| 16:04
11 | 05:07		19:04 (WEA09) | 05:55		18:59 (WEA09) | 06:49		18:56 (WEA02) | 07:42		17:58 (WEA08) | 07:41	| 08:30
| 21:51	107	20:54 (WEA04) | 21:03	72	20:11 (WEA09) | 19:52	16	19:12 (WEA02) | 18:39	12	18:10 (WEA08) | 16:35	| 16:04
12 | 05:09		19:04 (WEA09) | 05:56		19:00 (WEA09) | 06:51		18:54 (WEA02) | 07:44		18:01 (WEA08) | 07:43	| 08:31
| 21:50	108	20:55 (WEA04) | 21:01	70	20:10 (WEA09) | 19:50	19	19:13 (WEA02) | 18:37	7	18:08 (WEA08) | 16:33	| 16:04
13 | 05:10		19:03 (WEA09) | 05:58		19:00 (WEA09) | 06:52		18:53 (WEA02) | 07:46			| 07:45	| 08:32
| 21:49	111	20:55 (WEA04) | 20:59	69	20:09 (WEA09) | 19:47	20	19:13 (WEA02) | 18:34			| 16:31	| 16:04
14 | 05:11		19:03 (WEA09) | 06:00		19:00 (WEA09) | 06:54		18:52 (WEA02) | 07:48			| 07:47	| 08:33
| 21:48	111	20:55 (WEA04) | 20:57	69	20:09 (WEA09) | 19:45	22	19:14 (WEA02) | 18:32			| 16:30	| 16:04
15 | 05:12		19:02 (WEA09) | 06:02		19:00 (WEA09) | 06:56		18:50 (WEA02) | 07:50			| 07:49	| 08:34
| 21:47	112	20:55 (WEA04) | 20:55	67	20:07 (WEA09) | 19:42	23	19:13 (WEA02) | 18:30			| 16:28	| 16:04
16 | 05:14		19:03 (WEA09) | 06:03		19:01 (WEA09) | 06:58		18:50 (WEA02) | 07:52			| 07:51	| 08:35
| 21:46	112	20:56 (WEA04) | 20:53	66	20:07 (WEA09) | 19:40	22	19:12 (WEA02) | 18:27			| 16:27	| 16:04
17 | 05:15		19:02 (WEA09) | 06:05		19:02 (WEA09) | 06:59		18:50 (WEA02) | 07:53			| 07:53	| 08:36
| 21:45	114	20:56 (WEA04) | 20:51	65	20:07 (WEA03) | 19:37	20	19:10 (WEA02) | 18:25			| 16:25	| 16:04
18 | 05:16		19:02 (WEA09) | 06:07		19:02 (WEA09) | 07:01		18:50 (WEA02) | 07:55			| 07:54	| 08:37
| 21:44	114	20:56 (WEA04) | 20:48	65	20:07 (WEA03) | 19:35	18	19:08 (WEA02) | 18:23			| 16:24	| 16:04
19 | 05:18		19:01 (WEA09) | 06:09		19:03 (WEA09) | 07:03		18:49 (WEA02) | 07:57			| 07:56	| 08:37
| 21:42	114	20:55 (WEA04) | 20:46	65	20:08 (WEA03) | 19:33	15	19:04 (WEA02) | 18:21			| 16:22	| 16:05
20 | 05:19		19:02 (WEA09) | 06:10		19:04 (WEA09) | 07:05		18:50 (WEA02) | 07:59			| 07:58	| 08:38
| 21:41	114	20:56 (WEA04) | 20:44	64	20:08 (WEA03) | 19:30	12	19:02 (WEA02) | 18:18			| 16:21	| 16:05
21 | 05:20		19:01 (WEA09) | 06:12		19:04 (WEA09) | 07:06		18:51 (WEA02) | 08:01			| 08:00	| 08:39
| 21:40	115	20:56 (WEA04) | 20:42	64	20:08 (WEA03) | 19:28	9	19:00 (WEA02) | 18:16			| 16:20	| 16:05
22 | 05:22		19:01 (WEA09) | 06:14		19:05 (WEA09) | 07:08		18:51 (WEA02) | 08:03			| 08:02	| 08:39
| 21:38	114	20:55 (WEA04) | 20:40	63	20:08 (WEA03) | 19:25	6	18:57 (WEA02) | 18:14			| 16:18	| 16:06
23 | 05:23		19:01 (WEA09) | 06:16		19:07 (WEA09) | 07:10		18:09 (WEA08) | 08:05			| 08:03	| 08:40
| 21:37	115	20:56 (WEA04) | 20:37	61	20:08 (WEA03) | 19:23	11	18:54 (WEA02) | 18:12			| 16:17	| 16:06
24 | 05:25		19:00 (WEA09) | 06:17		19:07 (WEA09) | 07:12		18:05 (WEA08) | 08:07			| 08:05	| 08:40
| 21:36	115	20:55 (WEA04) | 20:35	59	20:06 (WEA03) | 19:20	17	18:22 (WEA08) | 18:10			| 16:16	| 16:07
25 | 05:26		19:01 (WEA09) | 06:19		19:09 (WEA09) | 07:14		18:03 (WEA08) | 07:09			| 08:07	| 08:40
| 21:34	115	20:56 (WEA04) | 20:33	55	20:04 (WEA03) | 19:18	21	18:24 (WEA08) | 17:07			| 16:15	| 16:08
26 | 05:28		19:00 (WEA09) | 06:21		19:11 (WEA09) | 07:15		18:02 (WEA08) | 07:10			| 08:08	| 08:41
| 21:32	115	20:55 (WEA04) | 20:30	51	20:02 (WEA03) | 19:15	24	18:26 (WEA08) | 17:05			| 16:14	| 16:08
27 | 05:30		18:59 (WEA09) | 06:23		19:13 (WEA09) | 07:17		17:59 (WEA08) | 07:12			| 08:10	| 08:41
| 21:31	115	20:54 (WEA04) | 20:28	46	19:59 (WEA03) | 19:13	27	18:26 (WEA08) | 17:03			| 16:13	| 16:09
28 | 05:31		19:00 (WEA09) | 06:24		19:16 (WEA09) | 07:19		17:58 (WEA08) | 07:14			| 08:12	| 08:41
| 21:29	114	20:54 (WEA04) | 20:26	41	19:57 (WEA03) | 19:10	28	18:26 (WEA08) | 17:01			| 16:12	| 16:10
29 | 05:33		18:59 (WEA09) | 06:26		19:19 (WEA09) | 07:21		17:57 (WEA08) | 07:16			| 08:13	| 08:41
| 21:28	114	20:53 (WEA04) | 20:23	36	19:55 (WEA03) | 19:08	30	18:27 (WEA08) | 16:59			| 16:11	| 16:11
30 | 05:34		18:59 (WEA09) | 06:28		19:25 (WEA09) | 07:22		17:57 (WEA08) | 07:18			| 08:15	| 08:41
| 21:26	113	20:53 (WEA04) | 20:21	22	19:52 (WEA03) | 19:06	30	18:27 (WEA08) | 16:57			| 16:10	| 16:12
31 | 05:36		18:59 (WEA09) | 06:30		19:41 (WEA03) |			| 07:20			|	| 08:41
| 21:24	112	20:52 (WEA04) | 20:19	9	19:50 (WEA03) |			| 16:55			|	| 16:13
Sonnenscheinstunden | 511		| 459		| 382			| 329			| 260	| 234
astr.max.mögl.Beschattung |	3403	|	2133	|	409		|	286		|	|
Red.Sonnenscheinwahrsch. |	0,38	|	0,42	|	0,35		|	0,29		|	|
Reduktion Betriebsdauer |	0,95	|	0,95	|	0,95		|	0,95		|	|
Reduktion Windrichtung |	0,62	|	0,63	|	0,65		|	0,65		|	|
Gesamte Reduktion |	0,22	|	0,25	|	0,21		|	0,18		|	|
Met.wahrsch.Beschattung |	761	|	536	|	88		|	51		|	|

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP33 - Horn 23, 21769 Armstorf

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:40	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:09
3	08:41	08:08	07:10	06:55	05:47	05:01	05:00	05:41	06:35	07:28	07:26	08:20
	16:17	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:02	05:45	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:46	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:03	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:08	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:46	05:39	04:58	05:03	05:48	06:42	07:35	07:34	08:25
	16:22	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:38	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:36	04:56	05:06	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:07	05:53	06:47	07:41	07:40	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:37	16:05
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:04	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:57	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:19	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:31	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:48	18:35	16:32	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:13	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:04	06:58	07:52	07:51	08:35
	16:36	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:17	06:07	07:01	07:56	07:55	08:37
	16:39	17:39	18:33	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:05
19	08:30	07:37	06:32	06:17	05:19	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:23	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:11	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:16	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:06
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:19	16:06
23	08:25	07:28	06:22	06:08	05:13	04:55	05:24	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:38	19:23	18:12	16:17	16:07
24	08:24	07:26	06:20	06:06	05:11	04:55	05:25	06:18	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:41	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:46	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:56	05:28	06:21	07:16	07:11	08:09	08:41
	16:54	17:55	18:47	20:44	21:35	21:58	21:33	20:31	19:16	17:06	16:14	16:09
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:57	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:58	05:07	04:57	05:31	06:25	07:19	07:15	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:56	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:35	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:57		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP34 - Sticht 3, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:42	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:07	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:08	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:55	21:12	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:08	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:40	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:04	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:19	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:50	20:59	19:48	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:56	07:55	08:37
	16:39	17:39	18:33	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38
	16:41	17:41	18:34	20:31	21:24	21:58	21:43	20:47	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:31	21:58	21:37	20:38	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:18	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:41	21:32	21:59	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	08:09	08:07	08:41
	16:52	17:53	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:16	07:11	08:09	08:41
	16:53	17:55	18:47	20:44	21:35	21:59	21:33	20:31	19:16	17:06	16:14	16:08
27	08:20	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:58	05:06	04:56	05:31	06:25	07:19	07:15	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:30	20:26	19:11	17:01	16:12	16:10
29	08:17		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:57		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP35 - Neues Moor 19, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember		
1	08:42		09:44 (WEA04)	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17		
	16:14	17	10:01 (WEA04)	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09		
2	08:41		09:45 (WEA04)	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18		
	16:15	16	10:01 (WEA04)	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08		
3	08:41		09:47 (WEA04)	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20		
	16:16	15	10:02 (WEA04)	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08		
4	08:41		09:47 (WEA04)	08:06	07:08	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21		
	16:17	14	10:01 (WEA04)	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07		
5	08:41		09:49 (WEA04)	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23		09:38 (WEA04)
	16:19	12	10:01 (WEA04)	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:06	6	09:44 (WEA04)
6	08:40		09:50 (WEA04)	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24		09:36 (WEA04)
	16:20	10	10:00 (WEA04)	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:43	16:06	10	09:46 (WEA04)
7	08:40		09:52 (WEA04)	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25		09:35 (WEA04)
	16:21	6	09:58 (WEA04)	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05	12	09:47 (WEA04)
8	08:39			07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:27		09:35 (WEA04)
	16:23			17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05	14	09:49 (WEA04)
9	08:39			07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28		09:35 (WEA04)
	16:24			17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05	15	09:50 (WEA04)
10	08:38			07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29		09:34 (WEA04)
	16:26			17:23	18:17	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04	16	09:50 (WEA04)
11	08:37			07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30		09:35 (WEA04)
	16:27			17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04	17	09:52 (WEA04)
12	08:37			07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31		09:35 (WEA04)
	16:29			17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04	18	09:53 (WEA04)
13	08:36			07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:53	07:46	07:45	08:32		09:35 (WEA04)
	16:30			17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04	18	09:53 (WEA04)
14	08:35			07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33		09:35 (WEA04)
	16:32			17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04	19	09:54 (WEA04)
15	08:34			07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34		09:36 (WEA04)
	16:34			17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04	19	09:55 (WEA04)
16	08:33			07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35		09:36 (WEA04)
	16:35			17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04	20	09:56 (WEA04)
17	08:32			07:41	06:36	06:22	05:21	04:54	05:15	06:05	07:00	07:54	07:53	08:36		09:35 (WEA04)
	16:37			17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04	20	09:55 (WEA04)
18	08:31			07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:55	08:37		09:36 (WEA04)
	16:39			17:39	18:32	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04	20	09:56 (WEA04)
19	08:30			07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38		09:37 (WEA04)
	16:40			17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05	20	09:57 (WEA04)
20	08:29			07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38		09:37 (WEA04)
	16:42			17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05	21	09:58 (WEA04)
21	08:28			07:33	06:27	06:13	05:15	04:54	05:20	06:12	07:07	08:01	08:00	08:39		09:37 (WEA04)
	16:44			17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05	21	09:58 (WEA04)
22	08:26			07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39		09:38 (WEA04)
	16:46			17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06	21	09:59 (WEA04)
23	08:25			07:28	06:22	06:08	05:13	04:54	05:23	06:16	07:10	08:05	08:04	08:40		09:38 (WEA04)
	16:48			17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06	21	09:59 (WEA04)
24	08:24			07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40		09:39 (WEA04)
	16:50			17:51	18:44	20:40	21:32	21:59	21:36	20:35	19:20	18:10	16:16	16:07	20	09:59 (WEA04)
25	08:22			07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41		09:40 (WEA04)
	16:51			17:52	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08	20	10:00 (WEA04)
26	08:21			07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41		09:40 (WEA04)
	16:53			17:54	18:47	20:44	21:35	21:59	21:33	20:31	19:15	17:05	16:14	16:08	20	10:00 (WEA04)
27	08:19			07:19	06:12	06:00	05:07	04:56	05:30	06:23	07:17	07:13	08:10	08:41		09:41 (WEA04)
	16:55			17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09	19	10:00 (WEA04)
28	08:18			07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41		09:41 (WEA04)
	16:57			17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10	20	10:01 (WEA04)
29	08:16				07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42		09:42 (WEA04)
	16:59				19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11	19	10:01 (WEA04)
30	08:15				07:05	05:53	05:04	04:57	05:34	06:28	07:23	07:18	08:15	08:42		09:43 (WEA04)
	17:01				19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12	18	10:01 (WEA04)
31	08:13				07:02		05:03		05:36	06:30		07:20		08:42		09:44 (WEA04)
	17:03				19:56		21:42		21:24	20:19		16:55		16:13	18	10:02 (WEA04)
Sonnenscheinstunden	251			274	367	420	493	509	511	459	382	329	260	234		
astr.max.mögl.Beschattung		90													482	
Red.Sonnenscheinwahrsch.		0,17													0,14	
Reduktion Betriebsdauer		0,95													0,95	
Reduktion Windrichtung		0,61													0,61	
Gesamte Reduktion		0,10													0,08	
Met.wahrsch.Beschattung		9													39	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April	Mai	Juni
1	08:41		09:23 (WEA05)	08:12	09:32 (WEA05)	07:14	07:39 (WEA06)	07:00	05:51	05:02
	16:14	120	15:05 (WEA02)	17:05	45	10:17 (WEA05)	18:00	33	08:12 (WEA06)	19:58	20:53	21:43
2	08:41		09:23 (WEA05)	08:10	09:33 (WEA05)	07:12	07:38 (WEA06)	06:57	05:49	05:01
	16:15	119	15:06 (WEA02)	17:07	43	10:16 (WEA05)	18:02	35	08:13 (WEA06)	20:00	20:55	21:44
3	08:41		09:24 (WEA05)	08:08	09:34 (WEA05)	07:10	07:36 (WEA06)	06:55	05:47	05:00
	16:16	116	15:06 (WEA02)	17:09	41	10:15 (WEA05)	18:04	37	08:13 (WEA06)	20:02	20:57	21:45
4	08:41		09:24 (WEA05)	08:06	09:36 (WEA05)	07:08	07:36 (WEA06)	06:53	05:45	04:59
	16:17	110	15:05 (WEA02)	17:11	39	10:15 (WEA05)	18:06	38	08:14 (WEA06)	20:04	20:59	21:46
5	08:41		09:24 (WEA05)	08:05	09:37 (WEA05)	07:05	07:34 (WEA06)	06:50	05:43	04:59
	16:19	107	15:05 (WEA02)	17:13	37	10:14 (WEA05)	18:08	39	08:13 (WEA06)	20:06	21:00	21:47
6	08:40		09:24 (WEA05)	08:03	09:38 (WEA05)	07:03	07:34 (WEA06)	06:48	05:41	04:58
	16:20	101	15:04 (WEA02)	17:15	35	10:13 (WEA05)	18:10	40	08:14 (WEA06)	20:07	21:02	21:48
7	08:40		09:24 (WEA05)	08:01	09:40 (WEA05)	07:00	07:34 (WEA06)	06:45	05:39	04:57
	16:21	93	15:03 (WEA02)	17:17	31	10:11 (WEA05)	18:12	40	08:14 (WEA06)	20:09	21:04	21:49
8	08:39		09:25 (WEA05)	07:59	09:42 (WEA05)	06:58	07:33 (WEA06)	06:43	05:37	04:57
	16:23	80	15:02 (WEA02)	17:19	28	10:10 (WEA05)	18:14	41	08:14 (WEA06)	20:11	21:06	21:50
9	08:39		09:25 (WEA05)	07:57	09:44 (WEA05)	06:56	07:34 (WEA06)	06:41	05:35	04:56
	16:24	74	14:47 (WEA03)	17:21	23	10:07 (WEA05)	18:16	40	08:14 (WEA06)	20:13	21:07	21:51
10	08:38		09:25 (WEA05)	07:55	09:47 (WEA05)	06:53	07:33 (WEA06)	06:38	05:34	04:56
	16:26	73	14:47 (WEA03)	17:23	17	10:04 (WEA05)	18:17	40	08:13 (WEA06)	20:15	21:09	21:52
11	08:37		09:25 (WEA05)	07:53	09:52 (WEA05)	06:51	07:33 (WEA06)	06:36	05:32	04:55
	16:27	72	14:46 (WEA03)	17:25	5	09:57 (WEA05)	18:19	40	08:13 (WEA06)	20:17	21:11	21:53
12	08:37		09:25 (WEA05)	07:51			06:49		07:33 (WEA06)	06:33	05:30	04:55
	16:29	71	14:46 (WEA03)	17:27			18:21	38	08:11 (WEA06)	20:18	21:13	21:54
13	08:36		09:25 (WEA05)	07:49			06:46		07:34 (WEA06)	06:31	05:28	04:54
	16:30	69	14:45 (WEA03)	17:29			18:23	37	08:11 (WEA06)	20:20	21:14	21:54
14	08:35		09:25 (WEA05)	07:47			06:44		07:34 (WEA06)	06:29	05:26	04:54
	16:32	67	14:44 (WEA03)	17:31			18:25	35	08:09 (WEA06)	20:22	21:16	21:55
15	08:34		09:26 (WEA05)	07:45			06:41		07:35 (WEA06)	06:26	05:25	04:54
	16:34	62	14:42 (WEA03)	17:33			18:27	33	08:08 (WEA06)	20:24	21:18	21:56
16	08:33		09:26 (WEA05)	07:43			06:39		07:36 (WEA06)	06:24	05:23	04:54
	16:35	57	14:40 (WEA03)	17:35			18:29	31	08:07 (WEA06)	20:26	21:19	21:56
17	08:32		09:26 (WEA05)	07:41			06:36		07:36 (WEA06)	06:22	05:21	04:54
	16:37	51	10:17 (WEA05)	17:37			18:31	29	08:05 (WEA06)	20:28	21:21	21:57
18	08:31		09:26 (WEA05)	07:39			06:34		07:38 (WEA06)	06:20	05:20	04:54
	16:39	50	10:16 (WEA05)	17:39			18:32	25	08:03 (WEA06)	20:29	21:23	21:57
19	08:30		09:26 (WEA05)	07:37			06:32		07:40 (WEA06)	06:17	05:18	04:54
	16:40	51	10:17 (WEA05)	17:41			18:34	20	08:00 (WEA06)	20:31	21:24	21:57
20	08:29		09:27 (WEA05)	07:35			06:29		07:43 (WEA06)	06:15	05:17	04:54
	16:42	51	10:18 (WEA05)	17:43			18:36	14	07:57 (WEA06)	20:33	21:26	21:58
21	08:28		09:27 (WEA05)	07:32			06:27			06:13	05:15	04:54
	16:44	50	10:17 (WEA05)	17:45			18:38			20:35	21:27	21:58
22	08:26		09:27 (WEA05)	07:30			06:24			06:10	05:14	04:54
	16:46	51	10:18 (WEA05)	17:47			18:40			20:37	21:29	21:58
23	08:25		09:27 (WEA05)	07:28		07:55 (WEA06)	06:22			06:08	05:13	04:54
	16:48	51	10:18 (WEA05)	17:49	1	07:56 (WEA06)	18:42			20:39	21:30	21:58
24	08:24		09:28 (WEA05)	07:26		07:51 (WEA06)	06:19			06:06	05:11	04:55
	16:49	50	10:18 (WEA05)	17:50	13	08:04 (WEA06)	18:44			20:40	21:32	21:58
25	08:22		09:28 (WEA05)	07:24		07:48 (WEA06)	06:17			06:04	05:10	04:55
	16:51	50	10:18 (WEA05)	17:52	18	08:06 (WEA06)	18:45			20:42	21:33	21:58
26	08:21		09:29 (WEA05)	07:21		07:46 (WEA06)	06:14			06:02	05:09	04:55
	16:53	50	10:19 (WEA05)	17:54	22	08:08 (WEA06)	18:47			20:44	21:35	21:58
27	08:19		09:29 (WEA05)	07:19		07:44 (WEA06)	06:12			06:00	05:07	04:56
	16:55	49	10:18 (WEA05)	17:56	26	08:10 (WEA06)	18:49			20:46	21:36	21:58
28	08:18		09:30 (WEA05)	07:17		07:41 (WEA06)	06:10			05:57	05:06	04:56
	16:57	48	10:18 (WEA05)	17:58	30	08:11 (WEA06)	18:51			20:48	21:38	21:58
29	08:16		09:31 (WEA05)	|			07:07			05:55	05:05	04:57
	16:59	47	10:18 (WEA05)	|			19:53			20:50	21:39	21:58
30	08:15		09:31 (WEA05)	|			07:05			05:53	05:04	04:57
	17:01	47	10:18 (WEA05)	|			19:55			20:51	21:40	21:58
31	08:13		09:32 (WEA05)	|			07:02			|	05:03	|
	17:03	45	10:17 (WEA05)	|			19:56			|	21:41	|
Sonnenscheinstunden	251			274			367			420	493	509
astr.max.mögl.Beschattung		2132			454			685				
Red.Sonnenscheinwahrsch.		0,17			0,24			0,28				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,62			0,61			0,62				
Gesamte Reduktion		0,10			0,14			0,16				
Met.wahrsch.Beschattung		214			62			112				

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September			Oktober			November			Dezember		
1	04:58		05:38		06:31			07:24		08:13 (WEA06)	07:22		09:15 (WEA05)	08:17		09:07 (WEA05)
	21:57		21:23		20:16			19:03	38	08:51 (WEA06)	16:53	19	09:34 (WEA05)	16:09	72	14:28 (WEA03)
2	04:59		05:39		06:33			07:26		08:11 (WEA06)	07:24		09:12 (WEA05)	08:18		09:08 (WEA05)
	21:57		21:21		20:14			19:01	39	08:50 (WEA06)	16:51	24	09:36 (WEA05)	16:08	73	14:30 (WEA03)
3	05:00		05:41		06:35			07:28		08:11 (WEA06)	07:26		09:11 (WEA05)	08:20		09:08 (WEA05)
	21:57		21:19		20:12			18:58	39	08:50 (WEA06)	16:49	29	09:40 (WEA05)	16:08	74	14:30 (WEA03)
4	05:00		05:43		06:37			07:30		08:11 (WEA06)	07:28		09:09 (WEA05)	08:21		09:09 (WEA05)
	21:56		21:17		20:09			18:56	40	08:51 (WEA06)	16:47	32	09:41 (WEA05)	16:07	79	14:46 (WEA02)
5	05:01		05:44		06:38			07:31		08:10 (WEA06)	07:30		09:08 (WEA05)	08:23		09:09 (WEA[illegible]
	21:56		21:15		20:07			18:53	41	08:51 (WEA06)	16:45	35	09:43 (WEA05)	16:06	92	14:48 (WE[illegible]
6	05:02		05:46		06:40			07:33		08:10 (WEA06)	07:32		09:06 (WEA05)	08:24		09:10 (WE[illegible]
	21:55		21:13		20:04			18:51	40	08:50 (WEA06)	16:43	38	09:44 (WEA05)	16:06	101	14:50 (WEA02)
7	05:03		05:48		06:42			07:35		08:10 (WEA06)	07:34		09:05 (WEA05)	08:25		09:10 (WEA05)
	21:54		21:11		20:02			18:49	40	08:50 (WEA06)	16:42	40	09:45 (WEA05)	16:05	107	14:51 (WEA02)
8	05:04		05:49		06:44			07:37		08:09 (WEA06)	07:36		09:04 (WEA05)	08:27		09:12 (WEA05)
	21:54		21:09		20:00			18:46	40	08:49 (WEA06)	16:40	42	09:46 (WEA05)	16:05	110	14:53 (WEA02)
9	05:05		05:51		06:45			07:39		08:09 (WEA06)	07:38		09:04 (WEA05)	08:28		09:12 (WEA05)
	21:53		21:07		19:57			18:44	39	08:48 (WEA06)	16:38	43	09:47 (WEA05)	16:05	116	14:54 (WEA02)
10	05:06		05:53		06:47			07:41		08:10 (WEA06)	07:39		09:03 (WEA05)	08:29		09:12 (WEA05)
	21:52		21:05		19:55			18:42	38	08:48 (WEA06)	16:36	45	09:48 (WEA05)	16:04	119	14:55 (WEA02)
11	05:07		05:55		06:49			07:42		08:10 (WEA06)	07:41		09:02 (WEA05)	08:30		09:13 (WEA05)
	21:51		21:03		19:52			18:39	37	08:47 (WEA06)	16:35	46	09:48 (WEA05)	16:04	120	14:55 (WEA02)
12	05:09		05:56		06:51			07:44		08:11 (WEA06)	07:43		09:02 (WEA05)	08:31		09:14 (WEA05)
	21:50		21:01		19:50			18:37	35	08:46 (WEA06)	16:33	47	09:49 (WEA05)	16:04	122	14:57 (WEA02)
13	05:10		05:58		06:52			07:46		08:13 (WEA06)	07:45		09:03 (WEA05)	08:32		09:15 (WEA05)
	21:49		20:59		19:47			18:34	32	08:45 (WEA06)	16:31	47	09:50 (WEA05)	16:04	124	14:58 (WEA02)
14	05:11		06:00		06:54			07:48		08:15 (WEA06)	07:47		09:02 (WEA05)	08:33		09:16 (WEA05)
	21:48		20:57		19:45			18:32	28	08:43 (WEA06)	16:30	49	09:51 (WEA05)	16:04	124	14:58 (WEA02)
15	05:12		06:02		06:56			07:50		08:17 (WEA06)	07:49		09:02 (WEA05)	08:34		09:16 (WEA05)
	21:47		20:55		19:42			18:30	25	08:42 (WEA06)	16:28	49	09:51 (WEA05)	16:04	125	14:59 (WEA02)
16	05:14		06:03		06:58			07:52		08:19 (WEA06)	07:51		09:02 (WEA05)	08:35		09:17 (WEA05)
	21:46		20:53		19:40			18:28	21	08:40 (WEA06)	16:27	50	09:52 (WEA05)	16:04	125	15:00 (WEA02)
17	05:15		06:05		06:59			07:54		08:21 (WEA06)	07:53		09:02 (WEA05)	08:36		09:17 (WEA05)
	21:45		20:51		19:38			18:25	16	08:37 (WEA06)	16:25	50	09:52 (WEA05)	16:04	126	15:00 (WEA02)
18	05:16		06:07		07:01			07:55		08:23 (WEA06)	07:54		09:02 (WEA05)	08:37		09:17 (WEA05)
	21:44		20:49		19:35			18:23	10	08:33 (WEA06)	16:24	50	09:52 (WEA05)	16:04	126	15:00 (WEA02)
19	05:18		06:09		07:03			07:57			07:56		09:02 (WEA05)	08:37		09:18 (WEA05)
	21:43		20:46		19:33			18:21			16:22	51	09:53 (WEA05)	16:05	127	15:01 (WEA02)
20	05:19		06:10		07:05			07:59			07:58		09:02 (WEA05)	08:38		09:18 (WEA05)
	21:41		20:44		19:30			18:18			16:21	51	09:53 (WEA05)	16:05	127	15:01 (WEA02)
21	05:20		06:12		07:07			08:01			08:00		09:03 (WEA05)	08:39		09:19 (WE[illegible]
	21:40		20:42		19:28			18:16			16:20	50	09:53 (WEA05)	16:05	127	15:02 (WE[illegible]
22	05:22		06:14		07:08			08:03			08:02		09:03 (WEA05)	08:39		09:19 (WEA05)
	21:39		20:40		19:25			18:14			16:18	51	09:54 (WEA05)	16:06	127	15:02 (WEA02)
23	05:23		06:16		07:10		08:28 (WEA06)	08:05			08:03		09:03 (WEA05)	08:40		09:20 (WEA05)
	21:37		20:37		19:23	11	08:39 (WEA06)	18:12			16:17	51	09:54 (WEA05)	16:06	127	15:03 (WEA02)
24	05:25		06:17		07:12		08:24 (WEA06)	08:07			08:05		09:04 (WEA05)	08:40		09:20 (WEA05)
	21:36		20:35		19:20	19	08:43 (WEA06)	18:10			16:16	50	09:54 (WEA05)	16:07	127	15:03 (WEA02)
25	05:26		06:19		07:14		08:22 (WEA06)	07:09			08:07		09:03 (WEA05)	08:41		09:20 (WEA05)
	21:34		20:33		19:18	23	08:45 (WEA06)	17:07			16:15	51	09:54 (WEA05)	16:08	127	15:03 (WEA02)
26	05:28		06:21		07:15		08:20 (WEA06)	07:11			08:09		09:04 (WEA05)	08:41		09:22 (WEA05)
	21:33		20:31		19:15	27	08:47 (WEA06)	17:05			16:14	57	14:18 (WEA03)	16:08	127	15:05 (WEA02)
27	05:30		06:23		07:17		08:17 (WEA06)	07:12			08:10		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:31		20:28		19:13	31	08:48 (WEA06)	17:03			16:13	62	14:21 (WEA03)	16:09	126	15:05 (WEA02)
28	05:31		06:24		07:19		08:16 (WEA06)	07:14			08:12		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:29		20:26		19:10	33	08:49 (WEA06)	17:01			16:12	67	14:24 (WEA03)	16:10	126	15:05 (WEA02)
29	05:33		06:26		07:21		08:15 (WEA06)	07:16			08:14		09:06 (WEA05)	08:41		09:22 (WEA05)
	21:28		20:24		19:08	35	08:50 (WEA06)	16:59			16:11	69	14:26 (WEA03)	16:11	124	15:05 (WEA02)
30	05:34		06:28		07:23		08:14 (WEA06)	07:18			08:15		09:06 (WEA05)	08:41		09:23 (WEA05)
	21:26		20:21		19:06	36	08:50 (WEA06)	16:57			16:10	71	14:27 (WEA03)	16:12	124	15:06 (WEA02)
31	05:36		06:30					07:20		09:20 (WEA05)				08:41		09:23 (WEA05)
	21:24		20:19					16:55	9	09:29 (WEA05)				16:13	123	15:06 (WEA02)
Sonnenscheinstunden	511		459		382			329			260			234		
astr.max.mögl.Beschattung						215			607			1416			3574	
Red.Sonnenscheinwahrsch.						0,35			0,29			0,19			0,14	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,62			0,62			0,61			0,64	
Gesamte Reduktion						0,21			0,17			0,11			0,08	
Met.wahrsch.Beschattung						44			104			158			303	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung **Schattenrezeptor:** IP37 - Mittelstenaher Str. 32, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November			Dezember		
1	08:41		12:55 (WEA06)	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22			08:17		12:43 (WEA06)
	16:14	108	15:36 (WEA04)	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53			16:09	110	15:33 (WEA04)
2	08:41		12:56 (WEA06)	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24			08:18		12:44 (WEA06)
	16:15	110	15:38 (WEA04)	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51			16:08	111	15:33 (WEA04)
3	08:41		12:57 (WEA06)	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26			08:20		12:43 (WEA06)
	16:16	109	15:39 (WEA04)	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49			16:08	112	15:31 (WEA04)
4	08:41		12:57 (WEA06)	08:06	07:07	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28			08:21		12:44 (WEA06)
	16:17	110	15:40 (WEA04)	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47			16:07	111	15:31 (WEA04)
5	08:40		12:58 (WEA06)	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30			08:22		12:43 (WEA06)
	16:19	111	15:42 (WEA04)	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45			16:06	111	15:29 (WEA04)
6	08:40		12:58 (WEA06)	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32			08:24		12:44 (WEA06)
	16:20	111	15:43 (WEA04)	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43			16:06	111	15:29 (WEA04)
7	08:40		12:58 (WEA06)	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34			08:25		12:44 (WEA06)
	16:21	111	15:44 (WEA04)	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41			16:05	111	15:28 (WEA04)
8	08:39		13:00 (WEA06)	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36			08:26		12:45 (WEA06)
	16:23	111	15:47 (WEA04)	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40			16:05	110	15:28 (WEA04)
9	08:39		13:00 (WEA06)	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:45	07:39	07:37			08:28		12:45 (WEA06)
	16:24	112	15:48 (WEA04)	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38			16:05	111	15:28 (WEA04)
10	08:38		13:00 (WEA06)	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:41	07:39			08:29		12:45 (WEA06)
	16:26	111	15:49 (WEA04)	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36			16:04	110	15:27 (WEA04)
11	08:37		13:01 (WEA06)	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41			08:30		12:45 (WEA06)
	16:27	111	15:51 (WEA04)	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:34			16:04	108	15:26 (WEA04)
12	08:37		13:02 (WEA06)	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43		12:59 (WEA06)	08:31		12:46 (WEA06)
	16:29	110	15:53 (WEA04)	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	18	13:17 (WEA06)	16:04	110	15:27 (WEA04)
13	08:36		13:02 (WEA06)	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45		12:57 (WEA06)	08:32		12:47 (WEA06)
	16:30	108	15:53 (WEA04)	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	24	13:21 (WEA06)	16:04	108	15:27 (WEA04)
14	08:35		13:03 (WEA06)	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47		12:54 (WEA06)	08:33		12:47 (WEA06)
	16:32	105	15:54 (WEA04)	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	30	13:24 (WEA06)	16:04	109	15:27 (WEA04)
15	08:34		13:04 (WEA06)	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49		12:52 (WEA06)	08:34		12:47 (WEA06)
	16:33	102	15:54 (WEA04)	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	34	13:26 (WEA06)	16:04	108	15:27 (WEA04)
16	08:33		13:05 (WEA06)	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51		12:51 (WEA06)	08:35		12:48 (WEA06)
	16:35	97	15:54 (WEA04)	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	45	15:22 (WEA04)	16:04	108	15:27 (WEA04)
17	08:32		13:06 (WEA06)	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53		12:49 (WEA06)	08:36		12:47 (WEA06)
	16:37	92	15:55 (WEA04)	17:37	18:30	20:28	21:21	21:57	21:45	20:51	19:37	18:25	16:25	52	15:24 (WEA04)	16:04	108	15:26 (WEA04)
18	08:31		13:06 (WEA06)	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54		12:48 (WEA06)	08:37		12:48 (WEA06)
	16:39	83	15:54 (WEA04)	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	59	15:26 (WEA04)	16:04	107	15:26 (WEA04)
19	08:30		13:08 (WEA06)	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56		12:47 (WEA06)	08:37		12:49 (WEA06)
	16:40	74	15:54 (WEA04)	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	64	15:28 (WEA04)	16:04	107	15:27 (WEA04)
20	08:29		13:09 (WEA06)	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58		12:46 (WEA06)	08:38		12:49 (WEA06)
	16:42	73	15:55 (WEA04)	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	67	15:29 (WEA04)	16:05	107	15:27 (WEA04)
21	08:28		13:10 (WEA06)	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00		12:46 (WEA06)	08:39		12:50 (WEA06)
	16:44	70	15:54 (WEA04)	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	70	15:30 (WEA04)	16:05	106	15:27 (WEA04)
22	08:26		13:11 (WEA06)	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02		12:45 (WEA06)	08:39		12:50 (WEA06)
	16:46	67	15:54 (WEA04)	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	73	15:31 (WEA04)	16:06	106	15:27 (WEA04)
23	08:25		13:12 (WEA06)	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03		12:45 (WEA06)	08:40		12:51 (WEA06)
	16:48	64	15:53 (WEA04)	17:48	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	74	15:31 (WEA04)	16:06	107	15:29 (WEA04)
24	08:24		13:14 (WEA06)	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05		12:44 (WEA06)	08:40		12:51 (WEA06)
	16:49	59	15:52 (WEA04)	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	81	15:32 (WEA04)	16:07	107	15:29 (WEA04)
25	08:22		13:15 (WEA06)	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07		12:43 (WEA06)	08:41		12:51 (WEA06)
	16:51	52	15:50 (WEA04)	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	91	15:32 (WEA04)	16:07	106	15:29 (WEA04)
26	08:21		13:18 (WEA06)	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09		12:43 (WEA06)	08:41		12:52 (WEA06)
	16:53	45	15:49 (WEA04)	17:54	18:47	20:44	21:35	21:58	21:33	20:30	19:15	17:05	16:14	96	15:32 (WEA04)	16:08	108	15:31 (WEA04)
27	08:19		13:19 (WEA06)	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10		12:43 (WEA06)	08:41		12:53 (WEA06)
	16:55	34	13:53 (WEA06)	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	101	15:33 (WEA04)	16:09	108	15:31 (WEA04)
28	08:18		13:21 (WEA06)	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12		12:43 (WEA06)	08:41		12:53 (WEA06)
	16:57	30	13:51 (WEA06)	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:10	17:01	16:12	105	15:34 (WEA04)	16:10	107	15:32 (WEA04)
29	08:16		13:25 (WEA06)		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13		12:43 (WEA06)	08:41		12:54 (WEA06)
	16:59	24	13:49 (WEA06)		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	108	15:34 (WEA04)	16:11	108	15:33 (WEA04)
30	08:15		13:29 (WEA06)		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15		12:43 (WEA06)	08:41		12:54 (WEA06)
	17:01	16	13:45 (WEA06)		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	110	15:34 (WEA04)	16:12	109	15:34 (WEA04)
31	08:13				07:02		05:03		05:36	06:30		07:20				08:41		12:55 (WEA06)
	17:03				19:56		21:41		21:24	20:19		16:55				16:13	109	15:36 (WEA04)
Sonnenscheinstunden	251			274	367	420	493	509	511	459	382	329	260			234		
astr.max.mögl.Beschattung		2520												1302			3369	
Red.Sonnenscheinwahrsch.		0,17												0,19			0,14	
Reduktion Betriebsdauer		0,95												0,95			0,95	
Reduktion Windrichtung		0,65												0,65			0,65	
Gesamte Reduktion		0,10												0,12			0,09	
Met.wahrsch.Beschattung		264												155			291	

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)

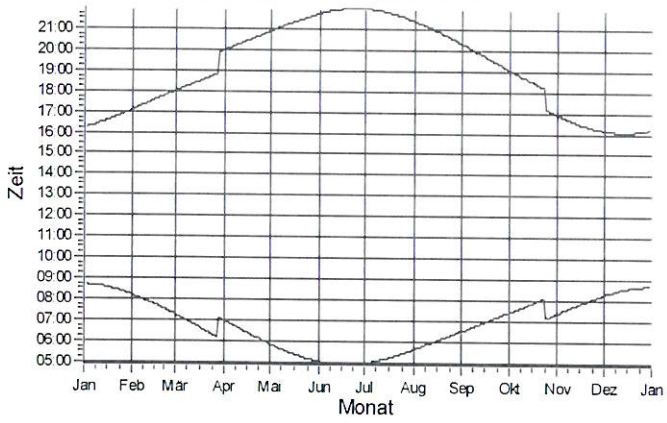
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

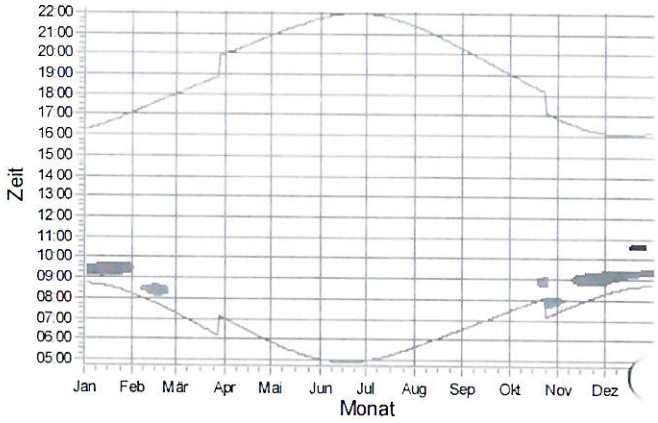
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

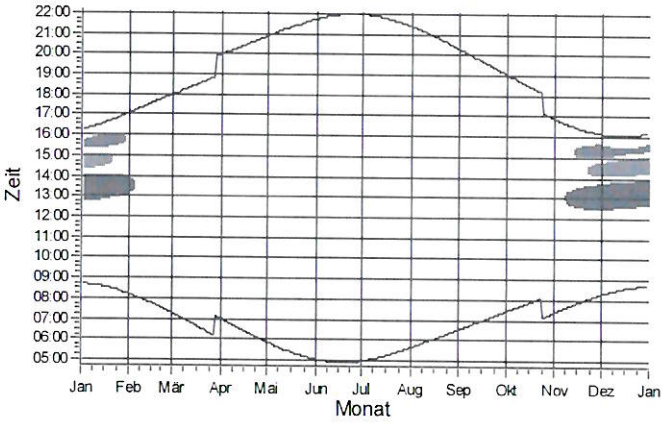
IP01: Sticht 1, 21770 Mittelstenahe



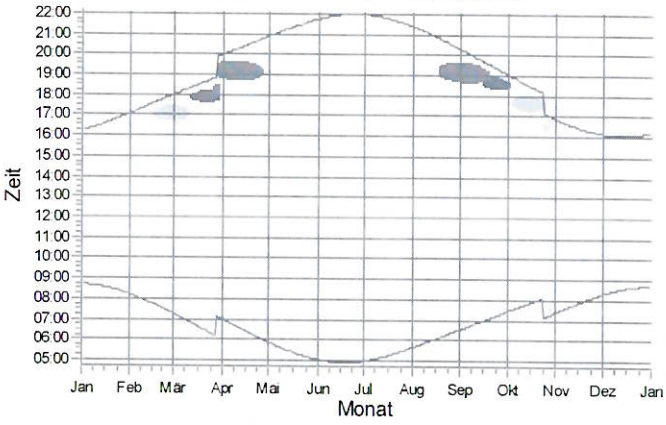
IP02: Neues Moor 21, 21770 Mittelstenahe



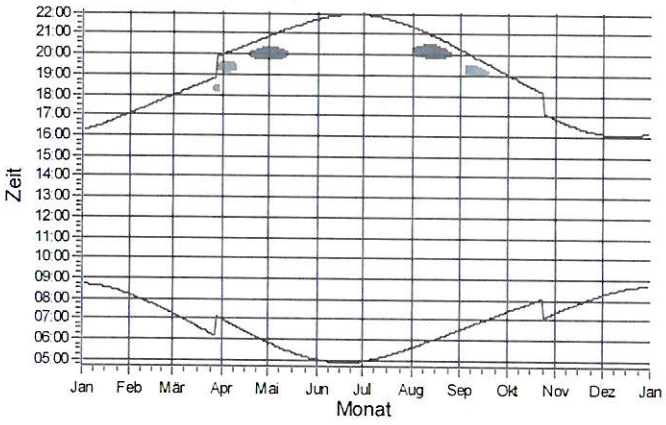
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



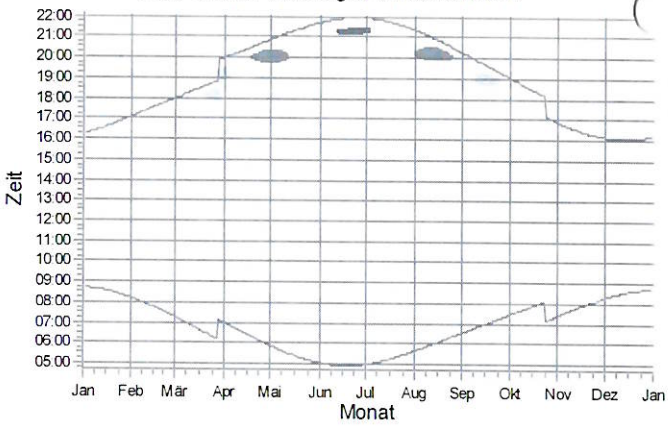
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuweg 5, 21769 Lamstedt



WEA

WEA03: E-175 EP5
WEA04: E-175 EP5
WEA05: E-175 EP5
WEA06: E-175 EP5
WEA09: E-175 EP5

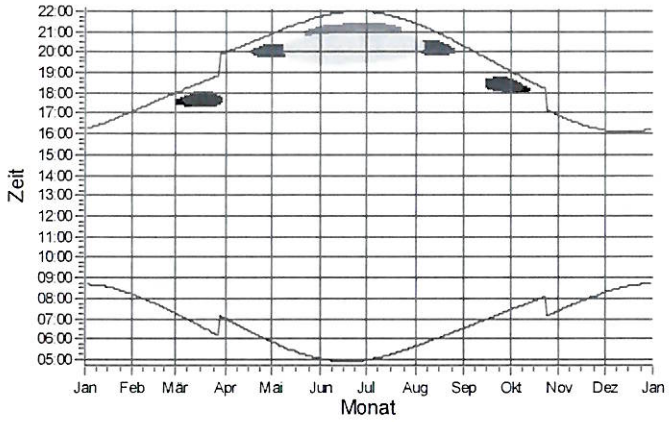
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

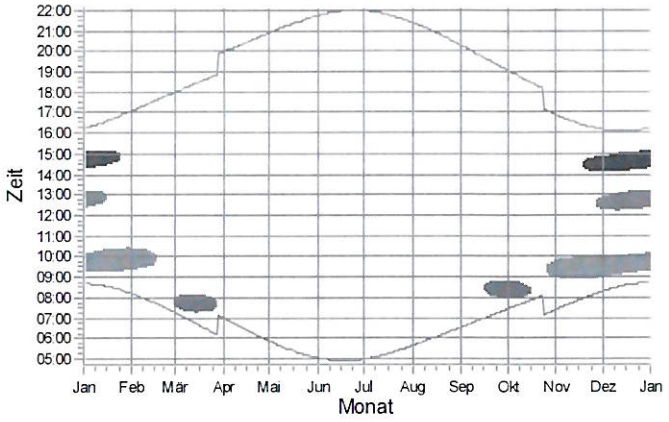
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

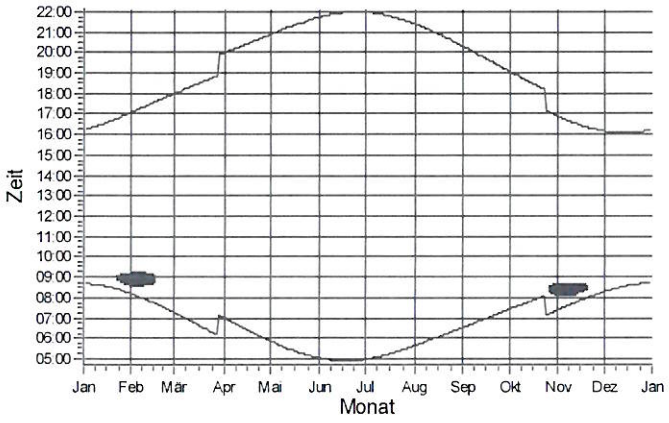
IP07: Driftweg 2, 21769 Lamstedt



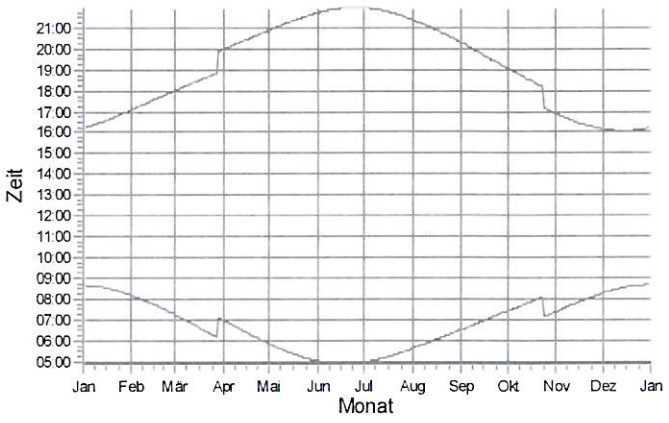
IP08: Haneworth 1, 21770 Lamstedt



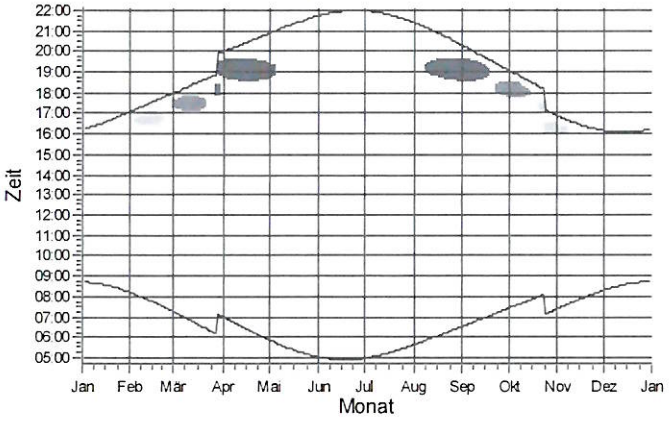
IP09: Sticht 5, 21770 Mittelstenahe



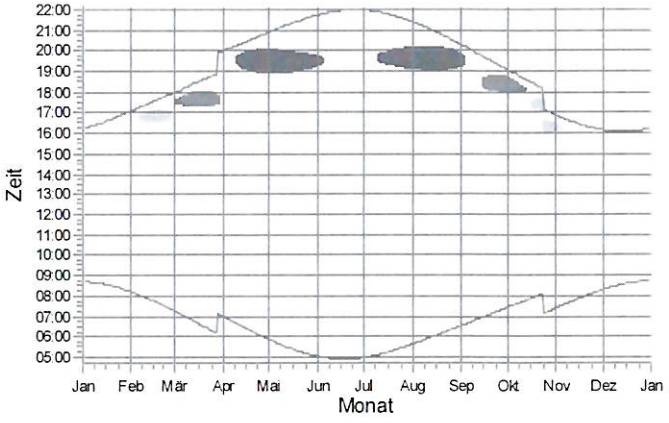
IP10: Falkenhorst 1, 21769 Lamstedt



IP11: Auf dem Kampen 2, 21769 Lamstedt



IP12: Auf dem Kampen 6, 21769 Lamstedt



WEA

WEA02: E-175 EP5
WEA03: E-175 EP5
WEA04: E-175 EP5
WEA05: E-175 EP5
WEA06: E-175 EP5
WEA07: E-175 EP5
WEA08: E-175 EP5
WEA09: E-175 EP5

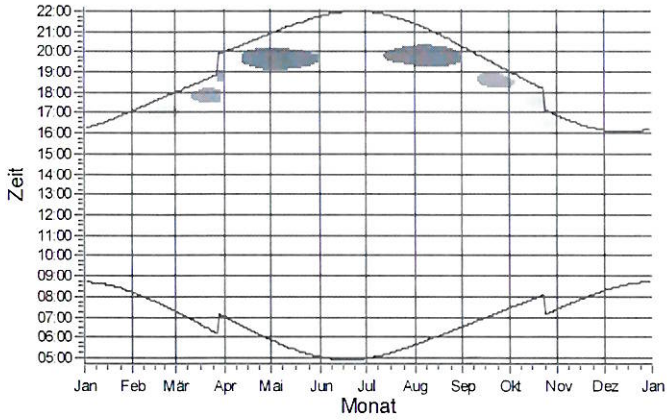
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

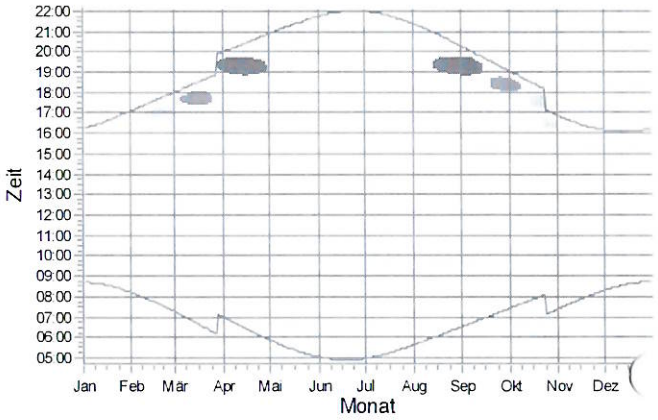
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

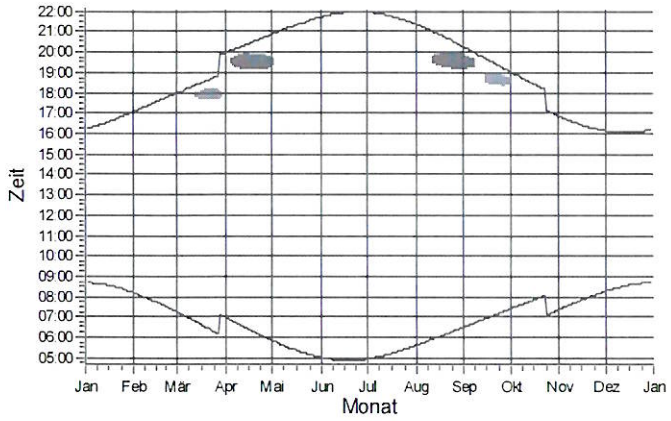
IP13: Auf dem Kampen 5, 21769 Lamstedt



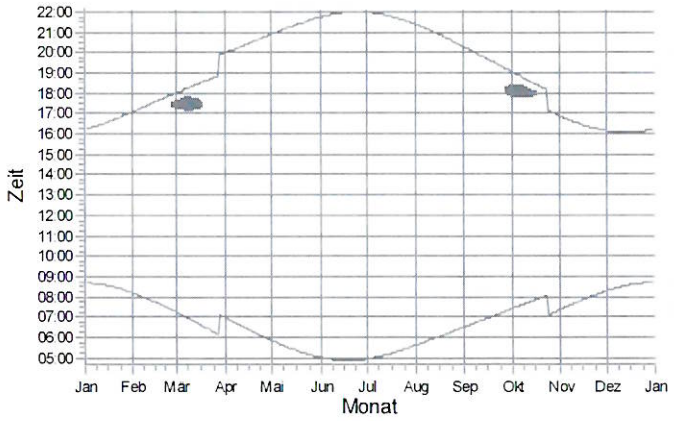
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



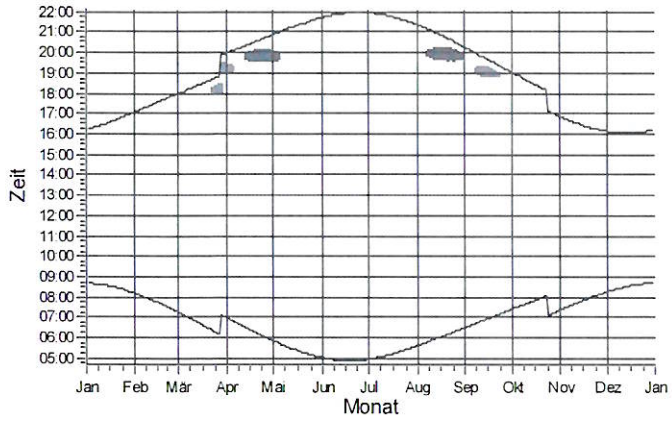
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



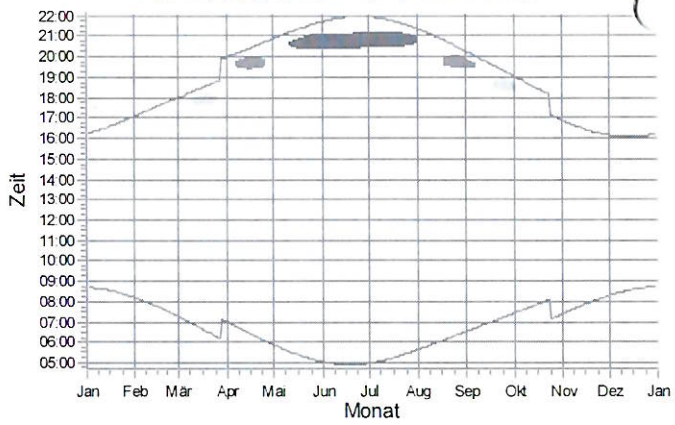
IP16: Kleiner Köven 15A, 21769 Lamstedt



IP17: An der Gösche 10, 21769 Lamstedt



IP18: Wischhofstraße 17a, 21769 Lamstedt



WEA

WEA05: E-175 EP5 WEA06: E-175 EP5 WEA09: E-175 EP5

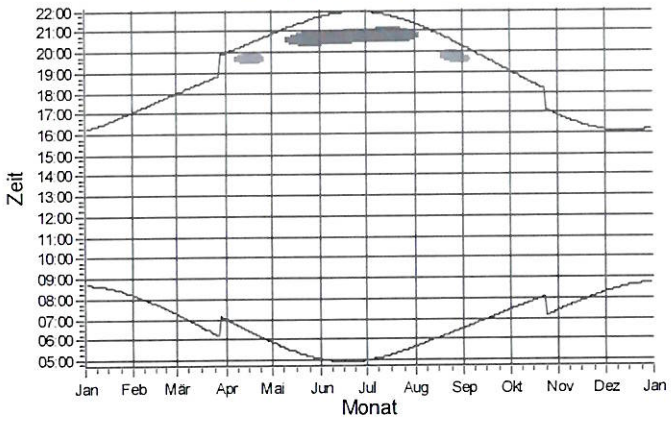
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

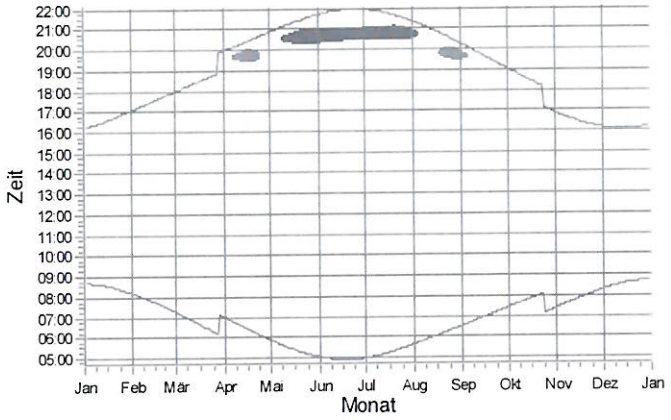
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

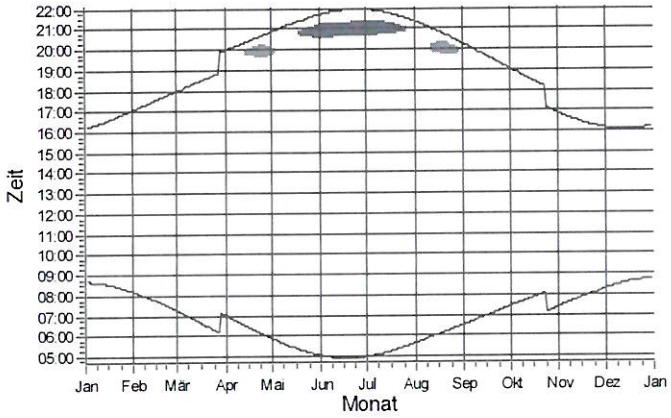
IP19: Wischhofstraße 15, 21769 Lamstedt



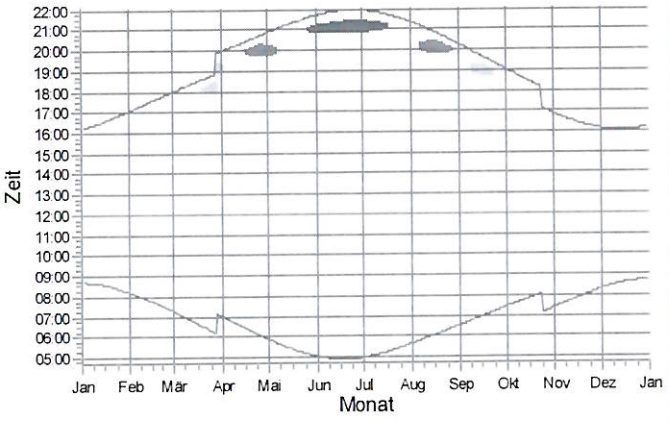
IP20: Wischhofstraße 13, 21769 Lamstedt



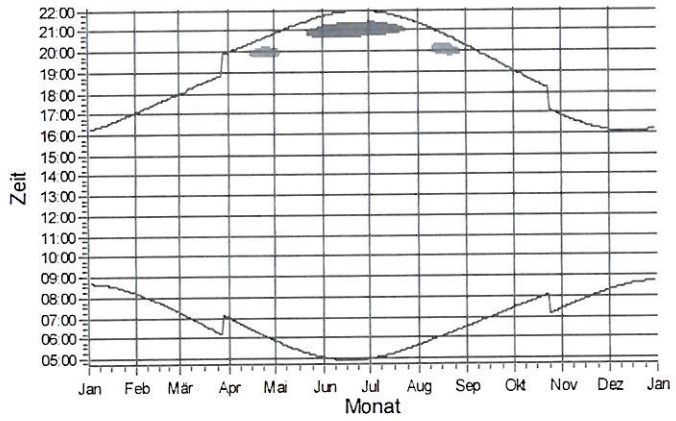
IP21: Auf der Stroth 18, 21769 Lamstedt



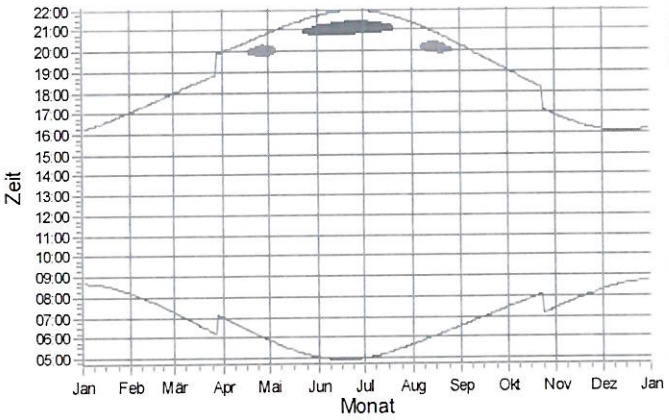
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt



WEA

WEA05: E-175 EP5

WEA06: E-175 EP5

WEA09: E-175 EP5

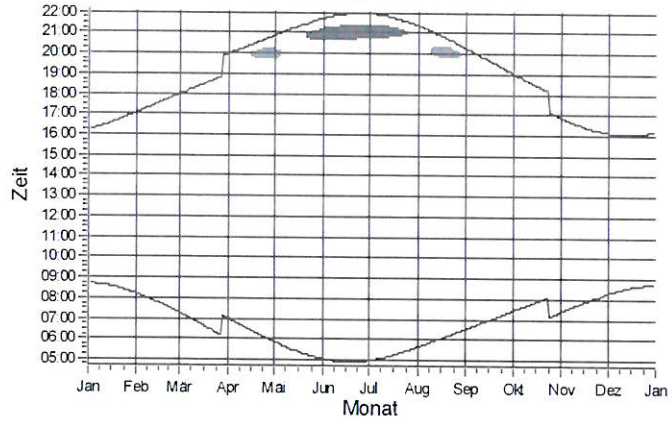
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

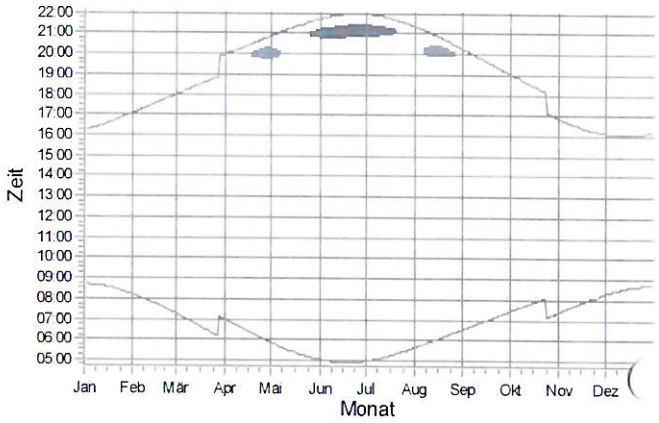
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

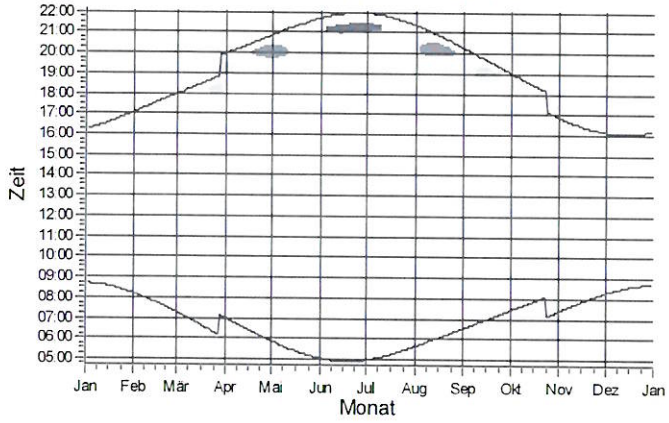
IP25: Auf der Stroth 21, 21769 Lamstedt



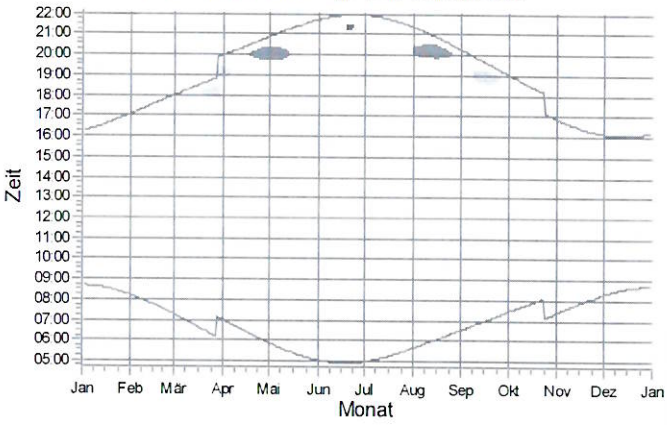
IP26: Auf der Stroth 25, 21769 Lamstedt



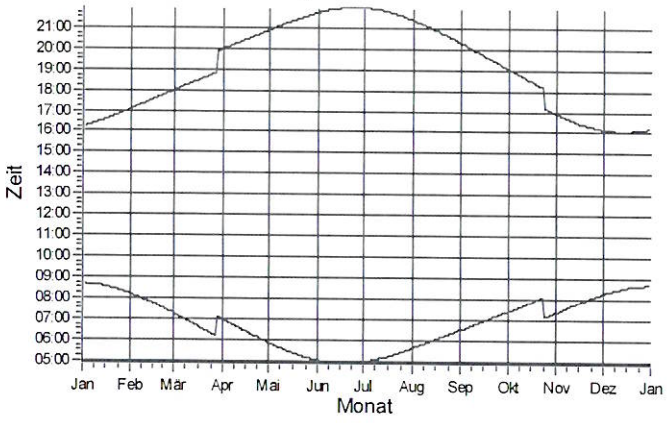
IP27: Strother Heuweg 1, 21769 Lamstedt



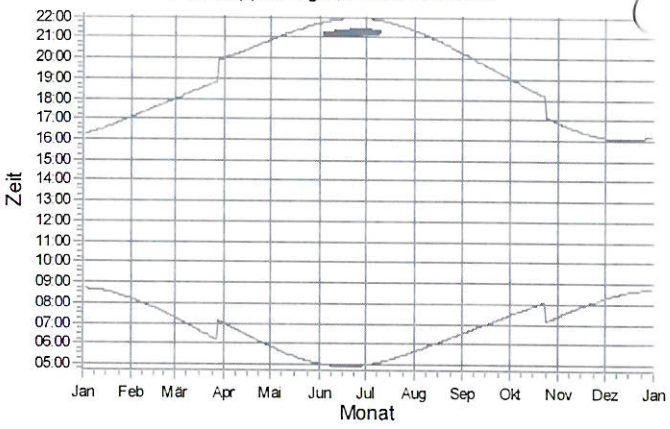
IP28: Strother Heuweg 9, 21769 Lamstedt



IP29: Birkenweg 11, 21769 Lamstedt



IP30: Pappelweg 7, 21769 Lamstedt



WEA

WEA05: E-175 EP5

WEA06: E-175 EP5

WEA09: E-175 EP5

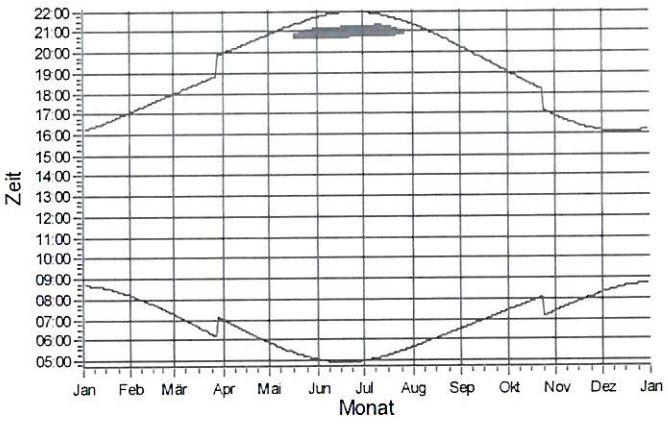
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

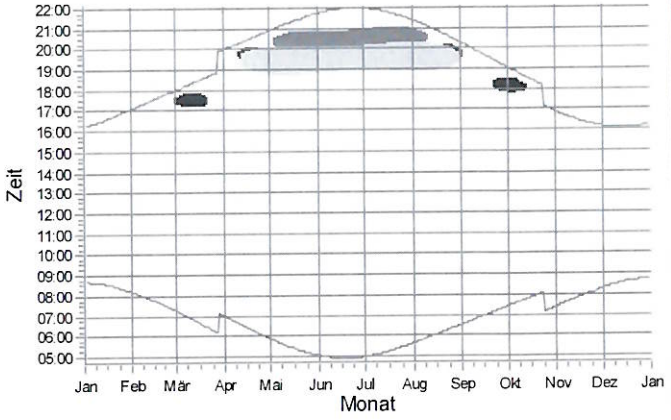
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

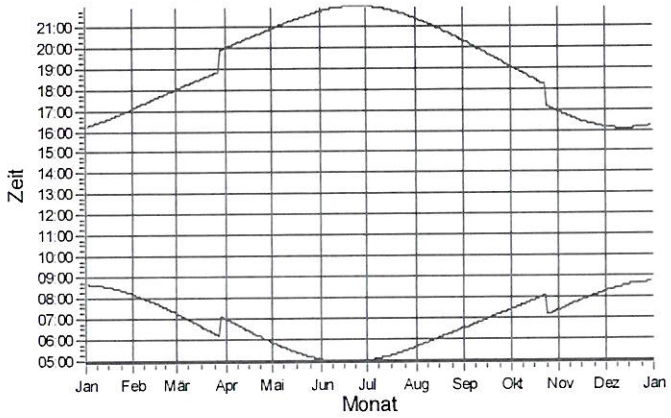
IP31: Jochensweg 8, 21769 Lamstedt



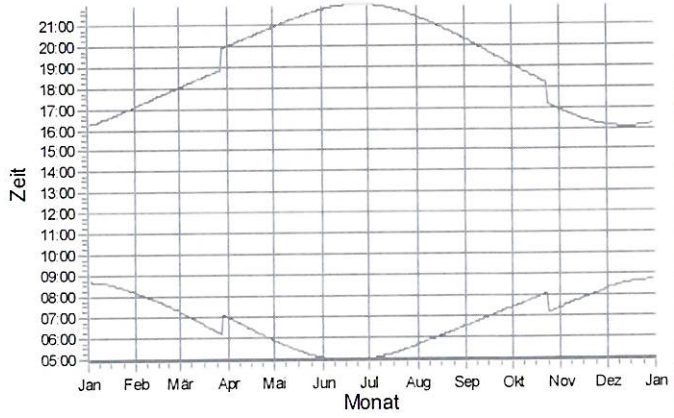
IP32: Driftweg 1, 21769 Lamstedt



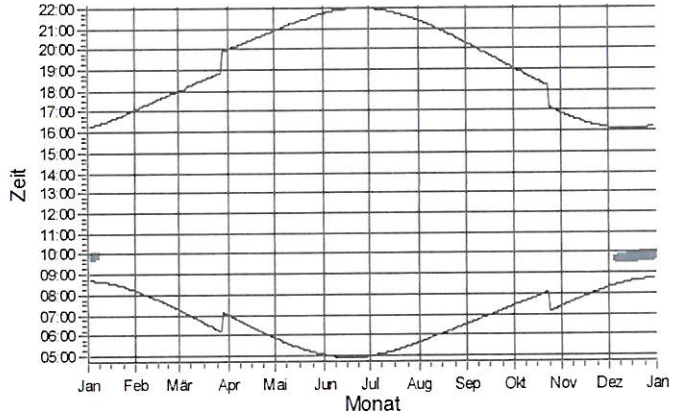
IP33: Horn 23, 21769 Armstorf



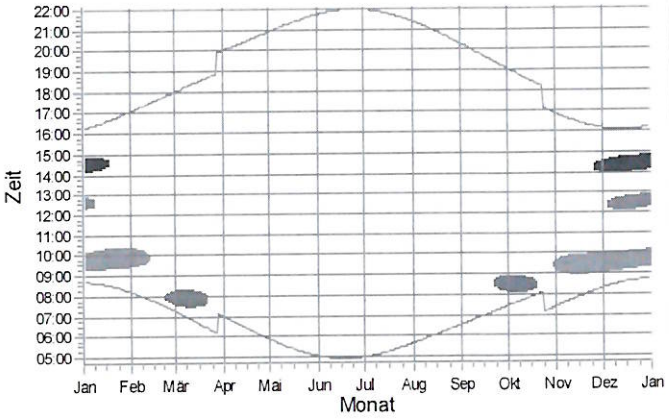
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Haneworth 2, 21770 Lamstedt



WEA

WEA02: E-175 EP5
WEA03: E-175 EP5
WEA04: E-175 EP5
WEA05: E-175 EP5
WEA06: E-175 EP5
WEA08: E-175 EP5
WEA09: E-175 EP5

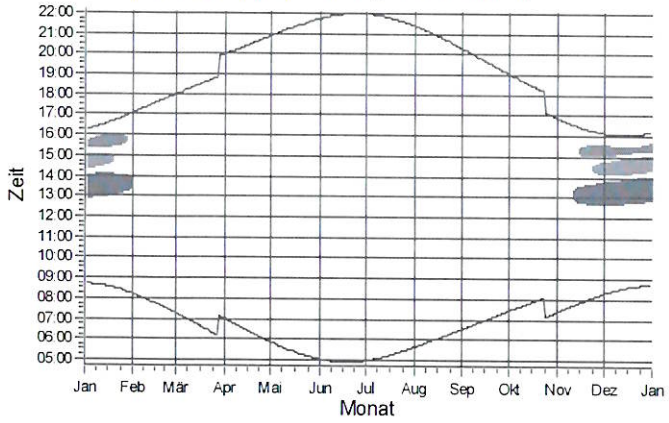
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

IP37: Mittelstenaher Str. 32, 21769 Lamstedt



WEA

WEA04: E-175 EP5

WEA05: E-175 EP5

WEA06: E-175 EP5

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA01 - E-138 EP3 E3

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:22	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:41
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA02 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar	März		April		Mai	Juni
1	08:41	14:47-15:19/32	08:12	07:15		07:00	19:03-19:31/28	05:51	05:02
	16:14	09:50-10:16/26	17:05	18:00		19:58		20:53	21:43
2	08:41	14:48-15:19/31	08:10	07:12		06:57	19:05-19:33/28	05:49	05:01
	16:15	09:51-10:16/25	17:07	18:02		20:00		20:55	21:44
3	08:41	14:49-15:20/31	08:08	07:10		06:55	19:08-19:32/24	05:47	05:00
	16:16	09:52-10:17/25	17:09	18:04		20:02		20:57	21:45
4	08:41	14:50-15:20/30	08:06	07:08		06:53	19:09-19:32/23	05:45	05:00
	16:18	09:52-10:17/25	17:11	18:06		20:04		20:59	21:46
5	08:40	14:52-15:20/28	08:05	07:05		06:50	19:09-19:31/22	05:43	04:59
	16:19	09:53-10:17/24	17:13	18:08		20:06		21:00	21:47
6	08:40	14:53-15:20/27	08:03	07:03		06:48	19:09-19:30/21	05:41	04:58
	16:20	09:54-10:17/23	17:15	18:10		20:07		21:02	21:48
7	08:40	14:54-15:20/26	08:01	07:00		06:45	19:11-19:28/17	05:39	04:57
	16:21	09:54-10:16/22	17:17	18:12		20:09		21:04	21:49
8	08:39	14:57-15:20/23	07:59	06:58		06:43	19:13-19:26/13	05:37	04:57
	16:23	09:56-10:17/21	17:19	18:14		20:11		21:06	21:50
9	08:39	09:57-10:16/19	07:57	06:56		06:41	19:15-19:22/7	05:35	04:56
	16:24	15:00-15:20/20	17:21	18:16		20:13		21:07	21:51
10	08:38	09:58-10:15/17	07:55	06:53		06:38		05:34	04:56
	16:26	15:01-15:20/19	17:23	18:17		20:15		21:09	21:52
11	08:37	10:00-10:15/15	07:53	06:51		06:36		05:32	04:55
	16:27	15:02-15:19/17	17:25	18:19		20:17		21:11	21:53
12	08:37	10:01-10:13/12	07:51	06:49		06:34		05:30	04:55
	16:29	15:03-15:18/15	17:27	18:21		20:18		21:13	21:54
13	08:36	10:04-10:12/8	07:49	06:46		06:31		05:28	04:55
	16:30	15:05-15:17/12	17:29	18:23		20:20		21:14	21:54
14	08:35	15:07-15:16/9	07:47	06:44		06:29		05:27	04:54
	16:32		17:31	18:25		20:22		21:16	21:55
15	08:34		07:45	06:41		06:27		05:25	04:54
	16:34		17:33	18:27		20:24		21:18	21:56
16	08:33		07:43	06:39		06:24		05:23	04:54
	16:35		17:35	18:29		20:26		21:19	21:56
17	08:32		07:41	06:36		06:22		05:22	04:54
	16:37		17:37	18:31		20:28		21:21	21:57
18	08:31		07:39	06:34		06:20		05:20	04:54
	16:39		17:39	18:32		20:29		21:23	21:57
19	08:30		07:37	06:32		06:17		05:18	04:54
	16:40		17:41	18:34		20:31		21:24	21:57
20	08:29		07:35	06:29		06:15		05:17	04:54
	16:42		17:43	18:36		20:33		21:26	21:58
21	08:28		07:32	06:27	18:07-18:11/4	06:13		05:15	04:54
	16:44		17:45	18:38		20:35		21:27	21:58
22	08:26		07:30	06:24	18:05-18:14/9	06:11		05:14	04:54
	16:46		17:47	18:40		20:37		21:29	21:58
23	08:25		07:28	06:22	18:04-18:15/11	06:08		05:13	04:54
	16:48		17:49	18:42		20:39		21:30	21:58
24	08:24		07:26	06:19	18:03-18:17/14	06:06		05:11	04:55
	16:50		17:51	18:44		20:40		21:32	21:58
25	08:22		07:24	06:17	18:02-18:19/17	06:04		05:10	04:55
	16:51		17:53	18:45		20:42		21:33	21:58
26	08:21		07:21	06:15	18:02-18:21/19	06:02		05:09	04:55
	16:53		17:54	18:47		20:44		21:35	21:58
27	08:19		07:19	06:12	18:01-18:22/21	06:00		05:08	04:56
	16:55		17:56	18:49		20:46		21:36	21:58
28	08:18		07:17	06:10	18:01-18:24/23	05:57		05:06	04:56
	16:57		17:58	18:51		20:48		21:38	21:58
29	08:16			07:07	19:02-19:27/25	05:55		05:05	04:57
	16:59			19:53		20:50		21:39	21:58
30	08:15			07:05	19:01-19:28/27	05:53		05:04	04:58
	17:01			19:55		20:51		21:40	21:58
31	08:13			07:02	19:02-19:30/28			05:03	
	17:03			19:56				21:41	
Sonnenscheinstunden	251		274	367		420		493	509
Anzahl Minuten mit Schatten	582		0	198		183		0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA02 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22	08:17 09:42-09:57/15
	21:57	21:23	20:16	19:03	16:53	16:09 14:44-15:01/17
2	04:59	05:39	06:33	07:26	07:24	08:18 09:41-09:58/17
	21:57	21:21	20:14	19:01	16:51	16:08 14:44-15:03/19
3	05:00	05:41	06:35 19:13-19:20/7	07:28	07:26	08:20 09:40-09:59/19
	21:57	21:19	20:12	18:58	16:49	16:08 14:43-15:03/20
4	05:01	05:43	06:37 19:10-19:23/13	07:30	07:28	08:21 14:42-15:04/22
	21:56	21:17	20:09	18:56	16:47	16:07 09:40-10:01/21
5	05:01	05:44	06:39 19:07-19:24/17	07:32	07:30	08:23 14:39-15:05/26
	21:56	21:15	20:07	18:54	16:45	16:06 09:40-10:02/22
6	05:02	05:46	06:40 19:06-19:26/20	07:33	07:32	08:24 14:39-15:06/27
	21:55	21:13	20:04	18:51	16:44	16:06 09:40-10:03/23
7	05:03	05:48	06:42 19:05-19:26/21	07:35	07:34	08:25 14:38-15:06/28
	21:54	21:11	20:02	18:49	16:42	16:05 09:39-10:03/24
8	05:04	05:50	06:44 19:03-19:26/23	07:37	07:36	08:27 14:38-15:08/30
	21:54	21:09	20:00	18:46	16:40	16:05 09:40-10:05/25
9	05:05	05:51	06:46 19:02-19:27/25	07:39	07:38	08:28 14:37-15:08/31
	21:53	21:07	19:57	18:44	16:38	16:05 09:40-10:05/25
10	05:06	05:53	06:47 18:58-19:27/29	07:41	07:39	08:29 14:37-15:09/32
	21:52	21:05	19:55	18:42	16:36	16:04 09:40-10:06/26
11	05:08	05:55	06:49 18:56-19:25/29	07:42	07:41	08:30 14:37-15:09/32
	21:51	21:03	19:52	18:39	16:35	16:04 09:41-10:07/26
12	05:09	05:56	06:51 18:54-19:22/28	07:44	07:43	08:31 14:38-15:10/32
	21:50	21:01	19:50	18:37	16:33	16:04 09:41-10:08/27
13	05:10	05:58	06:53 18:53-19:19/26	07:46	07:45	08:32 14:38-15:11/33
	21:49	20:59	19:47	18:35	16:31	16:04 09:41-10:08/27
14	05:11	06:00	06:54 18:52-19:17/25	07:48	07:47	08:33 14:38-15:11/33
	21:48	20:57	19:45	18:32	16:30	16:04 09:41-10:09/28
15	05:12	06:02	06:56 18:50-19:14/24	07:50	07:49	08:34 14:38-15:12/34
	21:47	20:55	19:43	18:30	16:28	16:04 09:42-10:09/27
16	05:14	06:03	06:58 18:50-19:12/22	07:52	07:51	08:35 14:39-15:13/34
	21:46	20:53	19:40	18:28	16:27	16:04 09:42-10:10/28
17	05:15	06:05	07:00 18:50-19:10/20	07:54	07:53	08:36 14:38-15:12/34
	21:45	20:51	19:38	18:25	16:25	16:04 09:42-10:10/28
18	05:16	06:07	07:01 18:50-19:08/18	07:55	07:54	08:37 14:39-15:13/34
	21:44	20:49	19:35	18:23	16:24	16:04 09:42-10:11/29
19	05:18	06:09	07:03 18:49-19:04/15	07:57	07:56	08:37 14:39-15:14/35
	21:43	20:46	19:33	18:21	16:22	16:05 09:43-10:11/28
20	05:19	06:10	07:05 18:50-19:02/12	07:59	07:58	08:38 14:39-15:14/35
	21:41	20:44	19:30	18:19	16:21	16:05 09:44-10:12/28
21	05:21	06:12	07:07 18:51-19:00/9	08:01	08:00	08:39 14:40-15:15/35
	21:40	20:42	19:28	18:16	16:20	16:05 09:44-10:12/28
22	05:22	06:14	07:08 18:51-18:57/6	08:03	08:02	08:39 14:40-15:15/35
	21:39	20:40	19:25	18:14	16:18	16:06 09:45-10:13/28
23	05:23	06:16	07:10 18:53-18:54/1	08:05	08:03	08:40 14:41-15:16/35
	21:37	20:37	19:23	18:12	16:17	16:06 09:45-10:13/28
24	05:25	06:17	07:12	08:07	08:05	08:40 14:41-15:16/35
	21:36	20:35	19:20	18:10	16:16	16:07 09:45-10:13/28
25	05:27	06:19	07:14	07:09	08:07	08:41 14:42-15:16/34
	21:34	20:33	19:18	17:08	16:15	16:08 09:46-10:14/28
26	05:28	06:21	07:15	07:11	08:09	08:41 14:43-15:17/34
	21:33	20:31	19:15	17:05	16:14	16:08 09:46-10:15/29
27	05:30	06:23	07:17	07:13	08:10	08:41 14:43-15:18/35
	21:31	20:28	19:13	17:03	16:13	16:09 09:47-10:15/28
28	05:31	06:24	07:19	07:14	08:12 14:47-14:56/9	08:41 14:44-15:18/34
	21:29	20:26	19:11	17:01	16:12	16:10 09:47-10:15/28
29	05:33	06:26	07:21	07:16	08:14 09:45-09:52/7	08:41 14:45-15:18/33
	21:28	20:24	19:08	16:59	16:11 14:46-14:58/12	16:11 09:48-10:16/28
30	05:34	06:28	07:23	07:18	08:15 09:44-09:55/11	08:41 14:45-15:19/34
	21:26	20:21	19:06	16:57	16:10 14:44-14:59/15	16:12 09:49-10:16/27
31	05:36	06:30		07:20		08:41 14:46-15:19/33
	21:24	20:19		16:55		16:13 09:49-10:16/27
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	390	0	54	1765

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA03 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April		Mai		Juni
1	08:41	14:13-15:04/51	08:12	08:39-09:08/29	07:14	07:00		05:51	19:44-20:19/35	05:02
	16:14		17:05		18:00	19:58		20:53		21:43
2	08:41	14:14-15:04/50	08:10	08:39-09:09/30	07:12	06:57		05:49	19:47-20:18/31	05:01
	16:15		17:07		18:02	20:00		20:55		21:44
3	08:41	14:15-15:05/50	08:08	08:40-09:10/30	07:10	06:55		05:47	19:47-20:18/31	05:00
	16:16		17:09		18:04	20:02		20:57		21:45
4	08:41	14:15-15:05/50	08:06	08:40-09:10/30	07:08	06:53		05:45	19:47-20:17/30	04:59
	16:18		17:11		18:06	20:04		20:59		21:46
5	08:40	14:16-15:06/50	08:05	08:40-09:10/30	07:05	06:50		05:43	19:48-20:17/29	04:59
	16:19		17:13		18:08	20:06		21:00		21:47
6	08:40	14:17-15:05/48	08:03	08:40-09:10/30	07:03	06:48		05:41	19:48-20:16/28	04:58
	16:20		17:15		18:10	20:07		21:02		21:48
7	08:40	14:17-15:05/48	08:01	08:40-09:10/30	07:00	06:45		05:39	19:48-20:15/27	04:57
	16:21		17:17		18:12	20:09		21:04		21:49
8	08:39	14:19-15:06/47	07:59	08:41-09:09/28	06:58	06:43		05:37	19:50-20:15/25	04:57
	16:23		17:19		18:14	20:11		21:06		21:50
9	08:39	14:20-15:06/46	07:57	08:41-09:09/28	06:56	06:41		05:35	19:50-20:14/24	04:56
	16:24		17:21		18:16	20:13		21:07		21:51
10	08:38	14:21-15:06/45	07:55	08:42-09:08/26	06:53	06:38		05:34	19:51-20:12/21	04:56
	16:26		17:23		18:17	20:15		21:09		21:52
11	08:37	14:22-15:06/44	07:53	08:43-09:08/25	06:51	06:36	19:45-19:50/5	05:32	19:53-20:11/18	04:55
	16:27		17:25		18:19	20:17		21:11		21:53
12	08:37	14:23-15:06/43	07:51	08:44-09:06/22	06:49	06:34	19:41-19:51/10	05:30	19:55-20:09/14	04:55
	16:29		17:27		18:21	20:18		21:13		21:54
13	08:36	14:25-15:06/41	07:49	08:45-09:04/19	06:46	06:31	19:40-19:53/13	05:28	19:57-20:06/9	04:54
	16:30		17:29		18:23	20:20		21:14		21:54
14	08:35	14:27-15:06/39	07:47	08:47-09:02/15	06:44	06:29	19:39-19:55/16	05:26		04:54
	16:32		17:31		18:25	20:22		21:16		21:55
15	08:34	14:29-15:06/37	07:45	08:51-08:59/8	06:41	06:26	19:37-19:56/19	05:25		04:54
	16:34		17:33		18:27	20:24		21:18		21:56
16	08:33	14:33-15:05/32	07:43		06:39	06:24	19:36-19:58/22	05:23		04:54
	16:35		17:35		18:29	20:26		21:19		21:56
17	08:32	14:37-15:05/28	07:41		06:36	06:22	19:35-20:00/25	05:22		04:54
	16:37		17:37		18:31	20:28		21:21		21:57
18	08:31	14:37-15:04/27	07:39		06:34	06:20	19:35-20:02/27	05:20		04:54
	16:39		17:39		18:32	20:29		21:23		21:57
19	08:30	14:39-15:03/24	07:37		06:32	06:17	19:34-20:03/29	05:18		04:54
	16:40		17:41		18:34	20:31		21:24		21:57
20	08:29	14:41-15:03/22	07:35		06:29	06:15	19:34-20:04/30	05:17		04:54
	16:42		17:43		18:36	20:33		21:26		21:58
21	08:28	14:43-15:01/18	07:32		06:27	06:13	19:34-20:06/32	05:15		04:54
	16:44		17:45		18:38	20:35		21:27		21:58
22	08:26	14:46-14:59/13	07:30		06:24	06:11	19:34-20:08/34	05:14		04:54
	16:46		17:47		18:40	20:37		21:29		21:58
23	08:25	08:54-08:58/4	07:28		06:22	06:08	19:34-20:10/36	05:13		04:54
	16:48	14:50-14:54/4	17:49		18:42	20:39		21:30		21:58
24	08:24	08:53-09:00/7	07:26		06:19	06:06	19:34-20:12/38	05:11		04:55
	16:50		17:51		18:44	20:40		21:32		21:58
25	08:22	08:51-09:02/11	07:24		06:17	06:04	19:35-20:14/39	05:10		04:55
	16:51		17:52		18:45	20:42		21:33		21:58
26	08:21	08:50-09:04/14	07:21		06:15	06:02	19:35-20:15/40	05:09		04:55
	16:53		17:54		18:47	20:44		21:35		21:58
27	08:19	08:48-09:05/17	07:19		06:12	06:00	19:36-20:17/41	05:07		04:56
	16:55		17:56		18:49	20:46		21:36		21:58
28	08:18	08:46-09:05/19	07:17		06:10	05:57	19:37-20:19/42	05:06		04:56
	16:57		17:58		18:51	20:48		21:38		21:58
29	08:16	08:45-09:07/22			07:07	05:55	19:39-20:19/40	05:05		04:57
	16:59				19:53	20:50		21:39		21:58
30	08:15	08:43-09:07/24			07:05	05:53	19:41-20:19/38	05:04		04:58
	17:01				19:55	20:51		21:40		21:58
31	08:13	08:41-09:08/27			07:02			05:03		
	17:03				19:56			21:41		
Sonnenscheinstunden	251		274		367	420		493		509
Anzahl Minuten mit Schatten		1002		380	0		576		322	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA03 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November		Dezember	
1	04:58		05:38	20:04-20:20/16	06:31	19:44-19:48/4	07:24		07:22	08:11-08:37/26	08:17	14:04-14:48/44
	21:57		21:23		20:16		19:03		16:53		16:09	
2	04:59		05:39	20:03-20:22/19	06:33		07:26		07:24	08:11-08:39/28	08:18	14:04-14:49/45
	21:57		21:21		20:14		19:01		16:51		16:08	
3	05:00		05:41	20:01-20:23/22	06:35		07:28		07:26	08:10-08:39/29	08:20	14:03-14:49/46
	21:57		21:19		20:12		18:58		16:49		16:08	
4	05:01		05:43	20:00-20:24/24	06:37		07:30		07:28	08:10-08:39/29	08:21	14:03-14:50/47
	21:56		21:17		20:09		18:56		16:47		16:07	
5	05:01		05:44	19:59-20:24/25	06:39		07:32		07:30	08:10-08:40/30	08:23	14:02-14:50/48
	21:56		21:15		20:07		18:53		16:45		16:06	
6	05:02		05:46	19:58-20:26/28	06:40		07:33		07:32	08:10-08:40/30	08:24	14:03-14:52/49
	21:55		21:13		20:04		18:51		16:43		16:06	
7	05:03		05:48	19:57-20:25/28	06:42		07:35		07:34	08:10-08:40/30	08:25	14:02-14:52/50
	21:54		21:11		20:02		18:49		16:42		16:05	
8	05:04		05:50	19:57-20:26/29	06:44		07:37		07:36	08:10-08:40/30	08:27	14:03-14:53/50
	21:54		21:09		20:00		18:46		16:40		16:05	
9	05:05		05:51	19:57-20:27/30	06:46		07:39		07:38	08:10-08:39/29	08:28	14:03-14:53/50
	21:53		21:07		19:57		18:44		16:38		16:05	
10	05:06		05:53	19:56-20:27/31	06:47		07:41		07:39	08:10-08:39/29	08:29	14:03-14:53/50
	21:52		21:05		19:55		18:42		16:36		16:04	
11	05:07		05:55	19:56-20:27/31	06:49		07:42		07:41	08:12-08:39/27	08:30	14:03-14:54/51
	21:51		21:03		19:52		18:39		16:35		16:04	
12	05:09		05:56	19:51-20:27/36	06:51		07:44		07:43	08:15-08:39/24	08:31	14:04-14:55/51
	21:50		21:01		19:50		18:37		16:33		16:04	
13	05:10		05:58	19:48-20:27/39	06:53		07:46		07:45	08:17-08:39/22	08:32	14:04-14:56/52
	21:49		20:59		19:47		18:35		16:31		16:04	
14	05:11		06:00	19:46-20:27/41	06:54		07:48		07:47	08:19-08:38/19	08:33	14:04-14:56/52
	21:48		20:57		19:45		18:32		16:30		16:04	
15	05:12		06:02	19:44-20:25/41	06:56		07:50		07:49	08:21-08:37/16	08:34	14:05-14:57/52
	21:47		20:55		19:42		18:30		16:28		16:04	
16	05:14		06:03	19:43-20:23/40	06:58		07:52		07:51	08:23-08:37/14	08:35	14:05-14:57/52
	21:46		20:53		19:40		18:28		16:27		16:04	
17	05:15		06:05	19:42-20:22/40	07:00		07:54		07:53	08:25-08:36/11	08:36	14:05-14:57/52
	21:45		20:51		19:38		18:25		16:25		16:04	10:33-10:36/3
18	05:16		06:07	19:40-20:19/39	07:01		07:55		07:54	08:27-08:34/7	08:37	14:05-14:58/53
	21:44		20:49		19:35		18:23		16:24		16:04	10:33-10:38/5
19	05:18		06:09	19:40-20:17/37	07:03		07:57		07:56	08:29-08:33/4	08:37	14:06-14:58/52
	21:43		20:46		19:33		18:21		16:22	14:25-14:29/4	16:05	10:33-10:40/7
20	05:19		06:10	19:40-20:15/35	07:05		07:59		07:58	14:21-14:34/13	08:38	14:06-14:58/52
	21:41		20:44		19:30		18:19		16:21		16:05	10:33-10:41/8
21	05:21		06:12	19:38-20:13/35	07:07		08:01		08:00	14:19-14:37/18	08:39	14:07-14:59/52
	21:40		20:42		19:28		18:16		16:20		16:05	10:33-10:41/8
22	05:22		06:14	19:38-20:11/33	07:08		08:03		08:02	14:17-14:39/22	08:39	14:07-14:59/52
	21:39		20:40		19:25		18:14		16:18		16:06	10:34-10:42/8
23	05:23		06:16	19:38-20:09/31	07:10		08:05		08:03	14:16-14:40/24	08:40	14:08-15:00/52
	21:37		20:37		19:23		18:12		16:17		16:06	10:34-10:42/8
24	05:25		06:17	19:37-20:06/29	07:12		08:07		08:05	14:15-14:42/27	08:40	14:08-15:00/52
	21:36		20:35		19:20		18:10		16:16		16:07	10:34-10:42/8
25	05:26		06:19	19:38-20:04/26	07:14		07:09		08:07	14:14-14:42/28	08:41	14:08-15:00/52
	21:34		20:33		19:18		17:08		16:15		16:08	10:36-10:42/6
26	05:28		06:21	19:38-20:02/24	07:15		07:11		08:09	14:11-14:43/32	08:41	14:09-15:02/53
	21:33		20:31		19:15		17:05		16:14		16:08	10:37-10:42/5
27	05:30		06:23	19:38-19:59/21	07:17		07:12	08:19-08:30/11	08:10	14:08-14:45/37	08:41	14:10-15:02/52
	21:31		20:28		19:13		17:03		16:13		16:09	
28	05:31		06:24	19:39-19:57/18	07:19		07:14	08:16-08:32/16	08:12	14:07-14:46/39	08:41	14:10-15:02/52
	21:29		20:26		19:11		17:01		16:12		16:10	
29	05:33		06:26	19:40-19:55/15	07:21		07:16	08:14-08:34/20	08:14	14:06-14:47/41	08:41	14:11-15:03/52
	21:28		20:24		19:08		16:59		16:11		16:11	
30	05:34	20:11-20:14/3	06:28	19:40-19:52/12	07:23		07:18	08:13-08:35/22	08:15	14:04-14:47/43	08:41	14:12-15:03/51
	21:26		20:21		19:06		16:57		16:10		16:12	
31	05:36	20:06-20:18/12	06:30	19:41-19:50/9			07:20	08:12-08:36/24			08:41	14:13-15:04/51
	21:24		20:19				16:55				16:13	
Sonnenscheinstunden	511		459		382		329		260		234	
Anzahl Minuten mit Schatten		15		884		4		93		762		1635

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA04 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 15:24-15:36/12 09:44-10:01/17 16:14 12:22-13:08/46 09:15-09:30/15	08:12 17:05	07:14 18:00	07:00 19:58	05:51 20:53	05:02 20:02-21:08/66 21:43
2	08:41 15:24-15:38/14 09:45-10:01/16 16:15 12:23-13:08/45 09:15-09:31/16	08:10 17:07	07:12 17:31-17:34/3 18:02	06:57 20:00	05:49 20:55	05:01 20:03-21:10/67 21:44
3	08:41 15:25-15:39/14 09:47-10:02/15 16:16 12:25-13:08/43 09:15-09:33/18	08:08 17:09	07:10 17:30-17:37/7 18:04	06:55 20:02	05:47 20:57	05:00 20:03-21:10/67 21:45
4	08:41 15:24-15:40/16 09:47-10:01/14 16:17 12:26-13:08/42 09:14-09:33/19	08:06 17:11	07:08 17:29-17:39/10 18:06	06:53 20:04	05:45 20:18-20:28/10 20:59	04:59 20:03-21:11/68 21:46
5	08:40 15:25-15:42/17 09:49-10:01/12 16:19 12:28-13:08/40 09:14-09:34/20	08:05 17:13	07:05 17:27-17:41/14 18:08	06:50 20:06	05:43 20:14-20:30/16 21:00	04:59 20:04-21:13/6[illegible] 21:47
6	08:40 15:25-15:43/18 09:50-10:00/10 16:20 12:30-13:07/37 09:13-09:34/21	08:03 17:15	07:03 17:27-17:43/16 18:10	06:48 20:07	05:41 20:12-20:31/19 21:02	04:58 20:04-21:13/69 21:48
7	08:40 15:25-15:44/19 09:52-09:58/6 16:21 12:33-13:07/34 09:12-09:35/23	08:01 17:17	07:00 17:26-17:44/18 18:12	06:45 20:09	05:39 20:10-20:33/23 21:04	04:57 20:05-21:14/69 21:49
8	08:39 15:26-15:47/21 09:12-09:36/24 16:23 12:36-13:07/31	07:59 17:19	06:58 17:26-17:47/21 18:14	06:43 20:11	05:37 20:09-20:35/26 21:06	04:57 20:05-21:14/69 21:50
9	08:39 15:26-15:48/22 09:11-09:36/25 16:24 12:37-13:06/29	07:57 17:21	06:56 17:26-17:49/23 18:16	06:41 20:13	05:35 20:07-20:36/29 21:07	04:56 20:05-21:15/70 21:51
10	08:38 15:26-15:49/23 09:10-09:37/27 16:26 12:39-13:05/26	07:55 17:23	06:53 17:26-17:49/23 18:17	06:38 20:15	05:34 20:06-20:38/32 21:09	04:56 20:05-21:14/69 21:52
11	08:37 15:26-15:51/25 09:09-09:37/28 16:27 12:40-13:04/24	07:53 17:25	06:51 17:27-17:49/22 18:19	06:36 20:17	05:32 20:06-20:40/34 21:11	04:55 20:06-21:15/69 21:53
12	08:37 15:27-15:53/26 09:08-09:38/30 16:29 12:42-13:03/21	07:51 17:27	06:49 17:27-17:47/20 18:21 17:52-17:54/2	06:33 20:18	05:30 20:04-20:41/37 21:13	04:55 20:06-21:16/70 21:54
13	08:36 15:27-15:54/27 09:09-09:38/29 16:30 12:45-13:01/16	07:49 17:29	06:46 17:28-17:46/18 18:23 17:49-17:57/8	06:31 20:20	05:28 20:03-20:42/39 21:14	04:54 20:06-21:15/69 21:54
14	08:35 15:28-15:55/27 09:09-09:39/30 16:32 12:49-12:58/9	07:47 17:31	06:44 17:29-17:43/14 18:25 17:47-17:58/11	06:29 20:22	05:26 20:03-20:43/40 21:16	04:54 20:07-21:16/69 21:55
15	08:34 15:28-15:55/27 16:34 09:09-09:39/30	07:45 17:33	06:41 17:33-17:40/7 18:27 17:46-18:00/14	06:26 20:24	05:25 20:02-20:43/41 21:18	04:54 20:07-21:16/69 21:55
16	08:33 15:29-15:56/27 16:35 09:10-09:40/30	07:43 17:35	06:39 17:44-18:02/18 18:29	06:24 20:26	05:23 20:02-20:44/42 21:19	04:54 20:07-21:17/70 21:56
17	08:32 15:30-15:56/26 16:37 09:10-09:40/30	07:41 17:37	06:36 17:44-18:04/20 18:31	06:22 20:28	05:21 20:02-20:44/42 21:21	04:54 20:08-21:17/69 21:57
18	08:31 15:30-15:55/25 16:39 09:10-09:40/30	07:39 17:39	06:34 17:43-18:06/23 18:32	06:20 20:29	05:20 20:02-20:45/43 21:23	04:54 20:08-21:17/69 21:57
19	08:30 15:31-15:56/25 16:40 09:11-09:40/29	07:37 17:41	06:32 17:42-18:08/26 18:34	06:17 20:31	05:18 20:02-20:45/43 21:24	04:54 20:08-21:17/69 21:57
20	08:29 15:32-15:56/24 16:42 09:12-09:41/29	07:35 17:43	06:29 17:42-18:10/28 18:36	06:15 20:33	05:17 20:01-20:45/44 21:26	04:54 20:08-21:18/70 21:58
21	08:28 15:32-15:55/23 16:44 09:12-09:40/28	07:32 17:45	06:27 17:42-18:10/28 18:38	06:13 20:35	05:15 20:01-20:45/44 21:27	04:54 20:08-21:19/71 21:58
22	08:26 15:33-15:56/23 16:46 09:13-09:41/28	07:30 17:47	06:24 17:42-18:10/28 18:40	06:10 20:37	05:14 20:01-20:46/45 21:29 20:49-20:54/5	04:54 20:09-21:19/70 21:58
23	08:25 15:34-15:55/21 16:48 09:13-09:40/27	07:28 17:49	06:22 17:42-18:08/26 18:42	06:08 20:39	05:13 20:01-20:57/56 21:30	04:54 20:09-21:19/70 21:58
24	08:24 15:36-15:54/18 16:50 09:14-09:40/26	07:26 17:50	06:19 17:43-18:08/25 18:44	06:06 20:40	05:11 20:01-20:58/57 21:32	04:55 20:09-21:18/69 21:58
25	08:22 15:37-15:53/16 16:51 09:15-09:40/25	07:24 17:52	06:17 17:43-18:06/23 18:45	06:04 20:42	05:10 20:01-21:00/59 21:33	04:55 20:10-21:19/69 21:58
26	08:21 15:39-15:52/13 16:53 09:16-09:40/24	07:21 17:54	06:14 17:44-18:05/21 18:47	06:02 20:44	05:09 20:01-21:01/60 21:35	04:55 20:09-21:19/70 21:58
27	08:19 15:41-15:50/9 16:55 09:17-09:39/22	07:19 17:56	06:12 17:45-18:02/17 18:49	06:00 20:46	05:07 20:01-21:02/61 21:36	04:56 20:10-21:20/70 21:58
28	08:18 09:18-09:37/19 16:57	07:17 17:58	06:10 17:48-18:00/12 18:51	05:57 20:48	05:06 20:02-21:04/62 21:38	04:56 20:10-21:19/69 21:58
29	08:16 09:21-09:37/16 16:59		07:07 19:53	05:55 20:49	05:05 20:02-21:05/63 21:39	04:57 20:10-21:20/70 21:58
30	08:15 09:23-09:34/11 17:01		07:05 19:55	05:53 20:51	05:04 20:02-21:06/64 21:40	04:58 20:10-21:19/69 21:58
31	08:13 09:28-09:29/1 17:03		07:02 19:56		05:03 20:02-21:07/65 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	1821	0 546		0 1201		2073

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA04 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 20:10-21:19/69 21:57	05:38 20:15-20:51/36 21:23	06:31 20:16	07:24 18:06-18:25/19 19:03 18:29-18:34/5	07:22 16:53	08:17 15:09-15:33/24 08:51-09:19/28 16:09 12:22-12:46/24
2	04:59 20:11-21:20/69 21:57	05:39 20:16-20:50/34 21:21	06:33 20:14	07:26 18:05-18:26/21 19:01	07:24 16:51	08:18 15:09-15:33/24 08:53-09:20/27 16:08 12:22-12:48/26
3	05:00 20:10-21:19/69 21:57	05:41 20:17-20:48/31 21:19	06:35 20:12	07:28 18:04-18:27/23 18:58	07:26 16:49	08:20 15:09-15:31/22 08:54-09:19/25 16:08 12:20-12:49/29
4	05:00 20:10-21:19/69 21:56	05:43 20:18-20:46/28 21:17	06:37 20:09	07:30 18:04-18:27/23 18:56	07:28 16:47	08:21 15:10-15:31/21 08:56-09:20/24 16:07 12:20-12:51/31
5	05:01 20:10-21:19/69 21:56	05:44 20:19-20:44/25 21:15	06:38 20:07	07:31 18:03-18:25/22 18:53	07:30 16:45	08:23 15:10-15:30/20 09:38-09:44/6 16:06 12:18-12:52/34 08:58-09:21/23
6	05:02 20:10-21:19/69 21:55	05:46 20:21-20:43/22 21:13	06:40 20:04	07:33 18:03-18:23/20 18:51	07:32 16:43	08:24 15:11-15:29/18 09:36-09:46/10 16:06 12:16-12:53/37 08:59-09:20/21
7	05:03 20:11-21:19/68 21:54	05:48 20:22-20:40/18 21:11	06:42 20:02	07:35 18:03-18:20/17 18:49	07:34 16:42	08:25 15:11-15:28/17 09:35-09:47/12 16:05 12:15-12:54/39 09:00-09:20/20
8	05:04 20:11-21:19/68 21:54	05:49 20:24-20:39/15 21:09	06:44 20:00	07:37 18:02-18:17/15 18:46	07:36 16:40	08:26 15:13-15:28/15 09:35-09:49/14 16:05 12:14-12:56/42 09:02-09:21/19
9	05:05 20:11-21:18/67 21:53	05:51 20:29-20:37/8 21:07	06:45 19:57	07:39 18:03-18:15/12 18:44	07:37 16:38	08:28 15:13-15:28/15 09:35-09:50/15 16:05 12:13-12:56/43 09:03-09:21/18
10	05:06 20:11-21:18/67 21:52	05:53 21:05	06:47 19:55	07:41 18:03-18:12/9 18:42	07:39 16:36	08:29 15:13-15:27/14 09:34-09:50/16 16:04 12:12-12:57/45 09:04-09:21/17
11	05:07 20:11-21:17/66 21:51	05:55 21:03	06:49 19:52	07:42 18:04-18:10/6 18:39	07:41 08:58-09:01/3 16:35	08:30 15:14-15:26/12 09:35-09:52/17 16:04 12:12-12:58/46 09:06-09:22/16
12	05:09 20:11-21:16/65 21:50	05:56 21:01	06:51 19:50	07:44 18:06-18:08/2 18:37	07:43 08:54-09:06/12 16:33	08:31 15:15-15:27/12 09:35-09:53/18 16:04 12:13-12:59/46 09:07-09:22/15
13	05:10 20:10-21:15/65 21:49	05:58 20:59	06:52 19:47	07:46 18:34	07:45 08:52-09:09/17 16:31	08:32 15:16-15:27/11 09:35-09:53/18 16:04 12:12-13:00/48 09:08-09:22/14
14	05:11 20:10-21:14/64 21:48	06:00 20:57	06:54 19:45	07:48 18:32	07:47 08:51-09:10/19 16:30	08:33 15:16-15:27/11 09:35-09:54/19 16:04 12:12-13:01/49 09:09-09:22/13
15	05:12 20:10-21:13/63 21:47	06:02 20:55	06:56 18:38-18:49/11 19:42	07:50 18:30	07:49 15:14-15:23/9 16:28 08:50-09:12/22	08:34 15:17-15:27/10 09:36-09:55/19 16:04 12:12-13:01/49 09:10-09:22/12
16	05:14 20:11-21:13/62 21:46	06:03 20:53	06:58 18:35-18:51/16 19:40	07:52 18:28	07:51 15:12-15:25/13 16:27 08:49-09:13/24	08:35 15:18-15:27/9 09:36-09:56/20 16:04 12:13-13:02/49 09:11-09:23/12
17	05:15 20:11-21:11/60 21:45	06:05 20:51	07:00 18:33-18:53/20 19:38	07:54 18:25	07:53 15:10-15:27/17 16:25 08:49-09:14/25	08:36 15:17-15:26/9 09:35-09:55/20 16:04 12:12-13:02/50 09:11-09:22/11
18	05:16 20:11-21:10/59 21:44	06:07 20:49	07:01 18:30-18:53/23 19:35	07:55 18:23	07:54 15:09-15:28/19 16:24 08:48-09:14/26	08:37 15:18-15:26/8 09:36-09:56/20 16:04 12:13-13:03/50 09:12-09:23/11
19	05:18 20:10-21:09/59 21:43	06:09 20:46	07:03 18:29-18:54/25 19:33	07:57 18:21	07:56 15:09-15:30/21 16:22 08:48-09:15/27	08:37 15:19-15:27/8 09:37-09:57/20 16:05 12:13-13:04/51 09:13-09:23/10
20	05:19 20:11-21:08/57 21:41	06:10 20:44	07:05 18:28-18:55/27 19:30	07:59 18:18	07:58 15:08-15:31/23 16:21 08:48-09:16/28	08:38 15:19-15:27/8 09:37-09:58/21 16:05 12:13-13:04/51 09:14-09:24/10
21	05:20 20:11-21:07/56 21:40	06:12 20:42	07:07 18:28-18:55/27 19:28	08:01 18:16	08:00 15:08-15:31/23 16:20 08:48-09:16/28	08:39 15:20-15:27/7 09:37-09:58/21 16:05 12:14-13:04/50 09:14-09:24/10
22	05:22 20:11-20:55/44 21:38	06:14 20:40	07:08 18:26-18:54/28 19:25	08:03 18:14	08:02 15:08-15:32/24 16:18 08:48-09:17/29	08:39 15:20-15:27/7 09:38-09:59/21 16:06 12:14-13:04/50 09:15-09:25/10
23	05:23 20:12-20:56/44 21:37	06:16 20:37	07:10 18:26-18:54/28 19:23	08:05 18:12	08:03 15:08-15:33/25 16:17 08:48-09:18/30	08:40 15:21-15:29/8 09:38-09:59/21 16:06 12:15-13:06/51 09:15-09:25/10
24	05:25 20:12-20:55/43 21:36	06:17 20:35	07:12 18:26-18:52/26 19:20	08:07 18:10	08:05 15:08-15:34/26 16:16 08:48-09:18/30	08:40 15:21-15:29/8 09:39-09:59/20 16:07 12:15-13:06/51 09:15-09:25/10
25	05:26 20:12-20:56/44 21:34	06:19 20:33	07:14 18:26-18:50/24 19:18	08:09 17:08	08:07 15:07-15:33/26 16:15 08:48-09:19/31	08:41 15:21-15:29/8 09:40-10:00/20 16:08 12:15-13:06/51 09:16-09:26/10
26	05:28 20:12-20:55/43 21:33	06:21 20:31	07:15 18:25-18:47/22 19:15	08:11 17:05	08:09 15:07-15:34/27 16:14 08:48-09:18/30	08:41 15:22-15:31/9 09:40-10:00/20 16:08 12:17-13:07/50 09:16-09:27/11
27	05:30 20:12-20:54/42 21:31	06:23 20:28	07:17 18:26-18:44/18 19:13	08:12 17:03	08:10 15:07-15:34/27 16:13 08:48-09:18/30	08:41 15:22-15:31/9 09:41-10:00/19 16:09 12:17-13:07/50 09:16-09:27/11
28	05:31 20:13-20:54/41 21:29	06:24 20:26	07:19 18:16-18:19/3 19:10 18:26-18:42/16	07:14 17:01	08:12 15:08-15:35/27 08:49-09:19/30 16:12 12:29-12:38/9	08:41 15:23-15:32/9 09:41-10:01/20 16:10 12:18-13:07/49 09:16-09:28/12
29	05:33 20:13-20:53/40 21:28	06:26 20:24	07:21 18:11-18:23/12 19:08 18:27-18:40/13	07:16 16:59	08:14 15:08-15:36/28 08:50-09:19/29 16:11 12:26-12:42/16	08:41 15:23-15:33/10 09:42-10:01/19 16:11 12:19-13:08/49 09:16-09:29/13
30	05:34 20:14-20:53/39 21:26	06:28 20:21	07:22 18:09-18:25/16 19:06 18:28-18:37/9	07:18 16:57	08:15 15:08-15:34/26 08:50-09:20/30 16:10 12:23-12:44/21	08:41 15:23-15:34/11 09:43-10:01/18 16:12 12:20-13:08/48 09:16-09:29/13
31	05:36 20:14-20:52/38 21:24	06:30 20:19		07:20 16:55		08:41 15:24-15:36/12 09:44-10:02/18 16:13 12:21-13:08/47 09:16-09:30/14
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	1778	217	364	194	907	2723

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA05 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni
1	08:41	14:22-14:58/36	08:11	09:28-10:21/53	07:14	17:25-17:33/8	07:00	18:53-19:31/38	05:51	19:50-20:19/29	05:02
	16:14	09:23-10:06/43	17:05		18:00		19:58		20:53		21:43
2	08:41	14:23-14:59/36	08:10	09:28-10:20/52	07:12	17:22-17:34/12	06:57	18:52-19:33/41	05:49	19:50-20:19/29	05:01
	16:15	09:23-10:07/44	17:07		18:02		20:00		20:55		21:44
3	08:41	14:24-15:00/36	08:08	09:29-10:20/51	07:10	17:20-17:37/17	06:55	18:51-19:35/44	05:47	19:50-20:18/28	05:00
	16:16	09:24-10:08/44	17:09		18:04		20:02		20:57		21:45
4	08:41	14:24-14:59/35	08:06	09:31-10:20/49	07:07	17:19-17:39/20	06:53	18:50-19:34/44	05:45	19:51-20:17/26	04:59
	16:17	09:23-10:08/45	17:11		18:06		20:04		20:58		21:46
5	08:40	14:25-15:00/35	08:05	09:31-10:19/48	07:05	17:17-17:41/24	06:50	18:50-19:34/44	05:43	19:51-20:16/25	04:59
	16:19	09:24-10:10/46	17:13		18:08		20:06		21:00		21:47
6	08:40	14:25-15:00/35	08:03	09:32-10:19/47	07:03	17:17-17:43/26	06:48	18:48-19:34/46	05:41	19:52-20:15/23	04:58
	16:20	09:23-10:10/47	17:15		18:10		20:07		21:02		21:48
7	08:40	14:26-15:00/34	08:01	09:33-10:18/45	07:00	17:15-17:44/29	06:45	19:39-19:42/3	05:39	19:52-20:14/22	04:57
	16:21	09:23-10:10/47	17:17	08:28-08:29/1	18:12		20:09	18:48-19:34/46	21:04		21:49
8	08:39	14:27-15:00/33	07:59	09:34-10:17/43	06:58	17:15-17:47/32	06:43	19:36-19:43/7	05:37	19:54-20:14/20	04:57
	16:23	09:24-10:12/48	17:19	08:26-08:31/5	18:14		20:11	18:48-19:34/46	21:06		21:50
9	08:39	14:28-15:00/32	07:57	09:35-10:16/41	06:56	17:15-17:49/34	06:41	19:35-19:45/10	05:35	19:55-20:12/17	04:56
	16:24	09:24-10:12/48	17:21	08:24-08:32/8	18:15		20:13	18:47-19:33/46	21:07		21:51
10	08:38	14:28-15:00/32	07:55	09:37-10:15/38	06:53	17:14-17:51/37	06:38	18:47-19:48/61	05:33	19:57-20:10/13	04:56
	16:26	09:24-10:13/49	17:23	08:22-08:33/11	18:17		20:15		21:09		21:52
11	08:37	14:29-15:00/31	07:53	09:37-10:12/35	06:51	17:14-17:53/39	06:36	18:47-19:49/62	05:32	20:00-20:08/8	04:55
	16:27	09:24-10:13/49	17:25	08:20-08:34/14	18:19		20:17		21:11		21:53
12	08:37	14:30-15:00/30	07:51	09:39-10:10/31	06:48	17:14-17:54/40	06:33	18:47-19:51/64	05:30		04:55
	16:29	09:24-10:14/50	17:27	08:17-08:34/17	18:21		20:18		21:13		21:54
13	08:36	14:31-14:59/28	07:49	09:42-10:08/26	06:46	17:14-17:57/43	06:31	18:47-19:53/66	05:28		04:54
	16:30	09:24-10:15/51	17:29	08:15-08:34/19	18:23		20:20		21:14		21:54
14	08:35	14:32-14:59/27	07:47	09:45-10:05/20	06:44	17:14-17:58/44	06:29	18:47-19:55/68	05:26		04:54
	16:32	09:24-10:15/51	17:31	08:13-08:35/22	18:25		20:22		21:16		21:55
15	08:34	14:34-14:58/24	07:45	09:49-10:00/11	06:41	17:15-18:00/45	06:26	18:47-19:56/69	05:25		04:54
	16:34	09:24-10:16/52	17:33	08:11-08:35/24	18:27		20:24		21:18		21:55
16	08:33	14:36-14:58/22	07:43	08:11-08:35/24	06:39	17:15-18:02/47	06:24	18:48-19:58/70	05:23		04:54
	16:35	09:24-10:17/53	17:35		18:29		20:26		21:19		21:56
17	08:32	14:37-14:57/20	07:41	08:12-08:34/22	06:36	17:16-18:04/48	06:22	19:30-20:00/30	05:21		04:54
	16:37	09:25-10:18/53	17:37		18:31		20:28	18:48-19:29/41	21:21		21:57
18	08:31	14:39-14:55/16	07:39	08:12-08:33/21	06:34	17:17-18:05/48	06:19	19:30-20:02/32	05:20		04:54
	16:39	09:24-10:18/54	17:39		18:32		20:29	18:49-19:28/39	21:23		21:57
19	08:30	09:24-10:18/54	07:37	08:13-08:32/19	06:32	17:19-18:08/49	06:17	19:30-20:03/33	05:18		04:54
	16:40	14:42-14:53/11	17:41		18:34		20:31	18:49-19:26/37	21:24		21:57
20	08:29	09:25-10:19/54	07:35	08:14-08:31/17	06:29	17:22-18:10/48	06:15	19:30-20:04/34	05:17		04:54
	16:42		17:43		18:36		20:33	18:51-19:25/34	21:26		21:58
21	08:27	09:25-10:19/54	07:32	08:16-08:30/14	06:27	17:23-18:11/48	06:13	19:31-20:06/35	05:15		04:54
	16:44		17:45		18:38		20:35	18:52-19:23/31	21:27		21:58
22	08:26	09:25-10:20/55	07:30	08:18-08:26/8	06:24	17:23-18:14/51	06:10	19:32-20:08/36	05:14		04:54
	16:46		17:47		18:40		20:37	18:54-19:22/28	21:29		21:58
23	08:25	09:25-10:20/55	07:28		06:22	17:23-18:15/52	06:08	19:34-20:10/36	05:13		04:54
	16:48		17:49		18:42		20:39	18:56-19:20/24	21:30		21:58
24	08:24	09:26-10:21/55	07:26		06:19	17:25-18:17/52	06:06	19:36-20:12/36	05:11		04:55
	16:49		17:50		18:43		20:40	18:58-19:17/19	21:32		21:58
25	08:22	09:25-10:21/56	07:24		06:17	17:25-18:19/54	06:04	19:47-20:14/27	05:10		04:55
	16:51		17:52		18:45		20:42	19:02-19:13/11	21:33		21:58
26	08:21	09:26-10:21/55	07:21		06:14	17:27-18:21/54	06:02	19:46-20:15/29	05:09		04:55
	16:53		17:54		18:47		20:44		21:35		21:58
27	08:19	09:26-10:21/55	07:19		06:12	17:28-18:22/54	05:59	19:47-20:16/29	05:07		04:56
	16:55		17:56		18:49		20:46		21:36		21:58
28	08:18	09:26-10:21/55	07:17	17:28-17:31/3	06:10	17:32-18:24/52	05:57	19:48-20:18/30	05:06		04:56
	16:57		17:58		18:51		20:48		21:37		21:58
29	08:16	09:27-10:22/55			07:07	18:38-19:27/49	05:55	19:48-20:19/31	05:05		04:57
	16:59				19:53		20:49		21:39		21:58
30	08:15	09:28-10:21/53			07:05	18:39-19:28/49	05:53	19:49-20:18/29	05:04		04:57
	17:01				19:55		20:51		21:40		21:58
31	08:13	09:28-10:21/53			07:02	18:42-19:30/48			05:03		
	17:03				19:56				21:41		
Sonnenscheinstunden	251		274		367		420		493		509
Anzahl Minuten mit Schatten	2136		839		1253		1586		240		0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA05 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 21:57	05:38 21:23	06:31 18:46-19:48/62 20:16	07:24 17:53-18:34/41 19:03	07:22 09:05-09:43/38 16:53 07:51-08:02/11	08:17 14:11-14:42/31 16:09 09:06-09:56/50
2	04:59 21:57	05:39 20:08-20:18/10 21:21	06:33 18:45-19:45/60 20:14	07:26 17:52-18:32/40 19:01	07:24 09:04-09:45/41 16:51 07:54-08:02/8	08:18 14:12-14:43/31 16:08 09:07-09:56/49
3	05:00 21:57	05:41 20:06-20:21/15 21:19	06:35 19:33-19:43/10 20:12 18:45-19:31/46	07:28 17:52-18:30/38 18:58	07:26 09:04-09:47/43 16:49 07:56-08:01/5	08:20 14:11-14:43/32 16:08 09:07-09:55/48
4	05:00 21:56	05:43 20:05-20:23/18 21:17	06:37 19:34-19:41/7 20:09 18:45-19:31/46	07:30 17:52-18:27/35 18:56	07:28 09:03-09:48/45 16:47 07:58-07:59/1	08:21 14:11-14:44/33 16:07 09:08-09:56/48
5	05:01 21:56	05:44 20:03-20:24/21 21:15	06:38 19:35-19:38/3 20:07 18:44-19:30/46	07:31 17:52-18:25/33 18:53	07:30 09:02-09:49/47 16:45	08:22 14:11-14:45/34 16:06 09:08-09:55/47
6	05:02 21:55	05:46 20:02-20:25/23 21:13	06:40 18:44-19:30/46 20:04	07:33 17:52-18:23/31 18:51	07:32 09:01-09:49/48 16:43	08:24 14:11-14:46/35 16:06 09:09-09:56/47
7	05:03 21:54	05:48 20:01-20:25/24 21:11	06:42 18:45-19:29/44 20:02	07:35 17:52-18:20/28 18:49	07:34 09:00-09:50/50 16:42	08:25 14:11-14:46/35 16:05 09:10-09:56/46
8	05:04 21:54	05:49 20:00-20:26/26 21:09	06:44 18:44-19:28/44 20:00	07:37 17:52-18:17/25 18:46	07:36 09:00-09:51/51 16:40	08:26 14:12-14:47/35 16:05 09:11-09:56/45
9	05:05 21:53	05:51 20:00-20:27/27 21:07	06:45 18:45-19:29/44 19:57	07:39 17:53-18:15/22 18:44	07:37 08:59-09:51/52 16:38	08:28 14:12-14:48/36 16:05 09:12-09:56/44
10	05:06 21:52	05:53 19:59-20:27/28 21:05	06:47 18:45-19:27/42 19:55	07:41 17:54-18:12/18 18:41	07:39 08:59-09:51/52 16:36	08:29 14:12-14:48/36 16:04 09:12-09:56/44
11	05:07 21:51	05:55 19:59-20:27/28 21:03	06:49 18:46-19:25/39 19:52	07:42 17:55-18:10/15 18:39	07:41 08:59-09:52/53 16:35	08:30 14:12-14:49/37 16:04 09:13-09:56/43
12	05:09 21:50	05:56 19:58-20:27/29 21:01	06:51 18:46-19:22/36 19:50 18:34-18:45/11	07:44 17:57-18:08/11 18:37	07:43 08:58-09:52/54 16:33	08:31 14:13-14:50/37 16:04 09:14-09:57/43
13	05:10 21:49	05:58 19:57-20:27/30 20:59	06:52 18:31-19:19/48 19:47	07:46 17:59-18:05/6 18:34	07:45 08:59-09:54/55 16:31	08:32 14:13-14:50/37 16:04 09:15-09:57/42
14	05:11 21:48	06:00 19:57-20:27/30 20:57	06:54 18:28-19:17/49 19:45	07:48 18:32	07:47 08:59-09:54/55 16:30	08:33 14:14-14:51/37 16:04 09:15-09:58/43
15	05:12 21:47	06:02 19:55-20:25/30 20:55	06:56 18:22-19:14/52 19:42	07:50 18:30	07:49 08:59-09:54/55 16:28	08:34 14:14-14:52/38 16:04 09:16-09:58/42
16	05:14 21:46	06:03 19:54-20:23/29 20:53	06:58 18:18-19:12/54 19:40	07:52 18:27	07:51 08:59-09:54/55 16:27	08:35 14:14-14:52/38 16:04 09:17-09:58/41
17	05:15 21:45	06:05 19:54-20:22/28 20:51	06:59 18:16-19:10/54 19:38	07:53 18:25	07:53 08:59-09:54/55 16:25	08:36 14:14-14:52/38 16:04 09:17-09:58/41
18	05:16 21:44	06:07 19:52-20:19/27 19:07-19:20/13 20:49 19:47-19:48/1	07:01 18:13-19:07/54 19:35	07:55 18:23	07:54 09:00-09:55/55 16:24	08:37 14:15-14:53/38 16:04 09:17-09:58/41
19	05:18 21:42	06:09 19:41-20:17/36 20:46 19:03-19:23/20	07:03 18:11-19:04/53 19:33	07:57 18:21	07:56 09:00-09:55/55 16:22	08:37 14:15-14:53/38 16:05 09:18-09:59/41
20	05:19 21:41	06:10 19:39-20:15/36 20:44 19:01-19:26/25	07:05 18:10-19:02/52 19:30	07:59 08:48-08:59/11 18:18	07:58 09:00-09:55/55 16:21	08:38 14:15-14:53/38 16:05 09:18-09:59/41
21	05:20 21:40	06:12 19:37-20:13/36 20:42 18:58-19:27/29	07:06 18:09-19:00/51 19:28	08:01 08:46-09:01/15 18:16	08:00 09:01-09:55/54 16:20	08:39 14:16-14:54/38 16:05 09:19-10:00/41
22	05:22 21:38	06:14 19:36-20:11/35 20:40 18:56-19:28/32	07:08 18:56-18:57/1 19:25 18:07-18:55/48	08:03 08:44-09:02/18 18:14	08:02 09:01-09:55/54 16:18	08:39 14:16-14:54/38 16:06 09:19-10:00/41
23	05:23 21:37	06:16 19:35-20:09/34 20:37 18:55-19:30/35	07:10 18:07-18:54/47 19:23	08:05 08:43-09:03/20 18:12	08:03 09:02-09:56/54 16:17 14:19-14:30/11	08:40 14:17-14:55/38 16:06 09:20-10:01/41
24	05:25 21:36	06:17 19:33-20:06/33 20:35 18:53-19:30/37	07:12 18:03-18:52/49 19:20	08:07 08:42-09:04/22 18:10	08:05 14:17-14:33/16 16:16 09:02-09:56/54	08:40 14:17-14:55/38 16:07 09:20-10:01/41
25	05:26 21:34	06:19 19:33-20:04/31 20:33 18:52-19:31/39	07:14 18:01-18:50/49 19:18	07:09 07:41-08:04/23 17:07	08:07 14:15-14:34/19 16:15 09:02-09:55/53	08:41 14:18-14:55/37 16:08 09:20-10:01/41
26	05:28 21:33	06:21 18:51-20:02/71 20:30	07:15 17:58-18:47/49 19:15	07:11 07:41-08:04/23 17:05	08:09 14:14-14:36/22 16:14 09:02-09:55/53	08:41 14:19-14:57/38 16:08 09:22-10:03/41
27	05:30 21:31	06:23 18:49-19:59/70 20:28	07:17 17:57-18:44/47 19:13	07:12 09:17-09:31/14 17:03 07:41-08:04/23	08:10 14:13-14:37/24 16:13 09:03-09:55/52	08:41 14:19-14:57/38 16:09 09:22-10:03/41
28	05:31 21:29	06:24 18:49-19:57/68 20:26	07:19 17:56-18:42/46 19:10	07:14 09:13-09:35/22 17:01 07:43-08:04/21	08:12 14:13-14:39/26 16:12 09:04-09:56/52	08:41 14:20-14:57/37 16:10 09:22-10:04/42
29	05:33 21:28	06:26 18:48-19:55/67 20:24	07:21 17:55-18:40/45 19:08	07:16 09:11-09:38/27 16:59 07:45-08:04/19	08:13 14:12-14:40/28 16:11 09:05-09:56/51	08:41 14:20-14:58/38 16:11 09:22-10:04/42
30	05:34 21:26	06:28 18:47-19:52/65 20:21	07:22 17:54-18:37/43 19:06	07:18 09:08-09:40/32 16:57 07:47-08:03/16	08:15 14:11-14:41/30 16:10 09:05-09:55/50	08:41 14:21-14:58/37 16:12 09:23-10:05/42
31	05:36 21:24	06:30 18:46-19:50/64 20:19		07:20 09:07-09:42/35 16:55 07:49-08:03/14		08:41 14:22-14:59/37 16:13 09:23-10:06/43
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	1300	1477	698	1742	2470

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA06 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 12:46-13:57/71 16:14	08:11 13:18-13:44/26 17:05	07:14 07:39-08:12/33 18:00 17:20-17:33/13	07:00 18:49-19:31/42 19:58	05:51 18:51-20:17/86 20:53	05:02 20:25-21:08/43 21:43 19:21-19:38/17
2	08:41 12:47-13:58/71 16:15	08:10 13:21-13:40/19 17:07	07:12 07:37-08:13/36 18:02 17:18-17:34/16	06:57 18:48-19:33/45 20:00	05:49 18:53-20:18/85 20:55	05:01 20:26-21:10/44 21:44 19:24-19:37/13
3	08:41 12:48-13:59/71 16:16	08:08 17:09	07:10 07:34-08:13/39 18:04 17:17-17:37/20	06:55 18:46-19:35/49 20:02	05:47 18:56-20:17/81 20:57	05:00 20:26-21:11/45 21:45 19:28-19:33/5
4	08:41 12:48-13:58/70 16:17	08:06 17:11	07:07 07:32-08:14/42 18:06 17:17-17:39/22	06:53 18:45-19:37/52 20:04	05:45 18:58-20:16/78 20:58	04:59 20:26-21:11/45 21:46
5	08:40 12:49-13:59/70 16:19	08:05 17:13	07:05 07:29-08:13/44 18:08 17:16-17:41/25	06:50 18:44-19:39/55 20:06	05:43 18:58-20:15/77 21:00	04:59 20:27-21:13/46 21:47
6	08:40 12:49-13:59/70 16:20	08:03 17:15	07:03 07:28-08:14/46 18:10 17:16-17:43/27	06:48 18:43-19:40/57 20:07	05:41 18:58-20:14/76 21:02	04:58 20:27-21:13/46 21:48
7	08:40 12:49-13:59/70 16:21	08:01 17:17	07:00 07:27-08:14/47 18:12 17:15-17:44/29	06:45 18:42-19:42/60 20:09	05:39 18:58-20:13/75 21:04	04:57 20:26-21:14/48 21:49
8	08:39 12:51-14:00/69 16:23	07:59 17:19	06:58 07:26-08:14/48 18:14 17:15-17:44/29	06:43 18:42-19:43/61 20:11	05:37 18:59-20:13/74 21:06	04:57 20:27-21:15/48 21:50
9	08:39 12:51-14:00/69 16:24	07:57 17:21	06:56 07:25-08:14/49 18:15 17:15-17:44/29	06:41 18:40-19:45/65 20:13	05:35 20:34-20:37/3 21:07 18:59-20:11/72	04:56 20:28-21:16/48 21:51
10	08:38 12:51-14:00/69 16:26	07:55 17:23	06:53 07:24-08:13/49 18:17 17:15-17:43/28	06:38 18:40-19:48/68 20:15	05:33 20:31-20:38/7 21:09 18:59-20:09/70	04:56 20:28-21:16/48 21:52
11	08:37 12:52-14:00/68 16:27	07:53 17:25	06:51 07:24-08:13/49 18:19 17:16-17:42/26	06:36 18:39-19:49/70 20:17	05:32 20:30-20:40/10 21:11 19:00-20:07/67	04:55 20:28-21:17/49 21:53
12	08:36 12:52-14:00/68 16:29	07:51 17:27	06:48 07:23-08:11/48 18:21 17:16-17:41/25	06:33 18:39-19:51/72 20:18	05:30 20:29-20:41/12 21:13 19:00-20:03/63	04:55 20:29-21:18/49 21:54
13	08:36 12:53-14:00/67 16:30	07:49 17:29	06:46 07:23-08:11/48 18:23 17:18-17:40/22	06:31 18:39-19:53/74 20:20	05:28 20:27-20:42/15 21:14 19:00-20:02/62	04:54 20:28-21:18/50 21:54
14	08:35 12:54-14:00/66 16:32	07:47 17:31	06:44 07:22-08:09/47 18:25 17:18-17:37/19	06:29 18:39-19:55/76 20:22	05:26 20:27-20:44/17 21:16 19:01-20:02/61	04:54 20:29-21:19/50 21:55
15	08:34 12:55-14:00/65 16:33	07:45 17:33	06:41 07:23-08:08/45 18:27 17:21-17:35/14	06:26 18:38-19:56/78 20:24	05:25 20:26-20:46/20 21:18 19:01-20:01/60	04:54 20:29-21:20/51 21:55
16	08:33 12:55-14:00/65 16:35	07:43 17:35	06:39 07:23-08:07/44 18:29 17:24-17:30/6	06:24 18:38-19:58/80 20:26	05:23 20:25-20:48/23 21:19 19:03-20:01/58	04:54 20:29-21:20/51 21:56
17	08:32 12:56-14:00/64 16:37	07:41 17:37	06:36 07:23-08:05/42 18:30	06:22 18:38-20:00/82 20:28	05:21 20:24-20:48/24 21:21 19:03-20:00/57	04:54 20:30-21:21/51 21:56
18	08:31 12:57-13:59/62 16:39	07:39 17:39	06:34 07:23-08:03/40 18:32	06:19 18:39-20:02/83 20:29	05:20 20:24-20:50/26 21:23 19:04-20:00/56	04:54 20:30-21:21/51 21:57
19	08:30 12:58-13:59/61 16:40	07:37 17:41	06:32 07:23-08:01/38 18:34	06:17 18:38-20:03/85 20:31	05:18 20:24-20:51/27 21:24 19:04-19:58/54	04:54 20:30-21:21/51 21:57
20	08:29 12:59-13:59/60 16:42	07:35 17:43	06:29 07:24-08:00/36 18:36	06:15 18:39-20:04/85 20:33	05:17 20:24-20:53/29 21:26 19:05-19:58/53	04:54 20:30-21:22/52 21:58
21	08:27 12:59-13:58/59 16:44	07:32 17:45	06:27 07:25-07:59/34 18:38	06:13 18:39-20:06/87 20:35	05:15 20:24-20:55/31 21:27 19:07-19:57/50	04:54 20:30-21:22/52 21:58
22	08:26 13:01-13:58/57 16:46	07:30 17:47	06:24 07:26-07:57/31 18:40	06:10 18:40-20:08/88 20:37	05:14 20:24-20:56/32 21:29 19:08-19:57/49	04:54 20:31-21:23/52 21:58
23	08:25 13:01-13:57/56 16:48	07:28 07:55-07:56/1 17:48	06:22 07:27-07:55/28 18:42	06:08 18:40-20:10/90 20:39	05:12 20:23-20:57/34 21:30 19:08-19:55/47	04:54 20:31-21:22/51 21:58
24	08:24 13:03-13:57/54 16:49	07:26 07:51-08:04/13 17:50	06:19 07:29-07:53/24 18:43	06:06 18:41-20:12/91 20:40	05:11 20:23-20:58/35 21:32 19:09-19:54/45	04:54 20:31-21:22/51 21:58
25	08:22 13:04-13:55/51 16:51	07:24 07:48-08:06/18 17:52	06:17 07:30-07:49/19 18:45	06:04 18:42-20:14/92 20:42	05:10 20:24-21:00/36 21:33 19:11-19:53/42	04:55 20:32-21:23/51 21:58
26	08:21 13:06-13:55/49 16:53	07:21 07:46-08:08/22 17:54 17:26-17:27/1	06:14 07:35-07:45/10 18:47	06:02 18:43-20:14/91 20:44	05:09 20:24-21:01/37 21:35 19:12-19:52/40	04:55 20:32-21:22/50 21:58
27	08:19 13:07-13:53/46 16:55	07:19 07:44-08:10/26 17:56 17:23-17:29/6	06:12 18:05-18:16/11 18:49	05:59 18:43-20:16/93 20:46	05:07 20:24-21:03/39 21:36 19:13-19:51/38	04:56 20:32-21:23/51 21:58
28	08:18 13:08-13:51/43 16:57	07:17 07:41-08:11/30 17:58 17:21-17:31/10	06:10 18:00-18:21/21 18:51	05:57 18:45-20:18/93 20:48	05:06 20:24-21:04/40 21:37 19:15-19:49/34	04:56 20:32-21:22/50 21:58
29	08:16 13:11-13:50/39 16:59		07:07 18:57-19:25/28 19:53	05:55 18:46-20:18/92 20:49	05:05 20:24-21:05/41 21:39 19:16-19:47/31	04:57 20:32-21:23/51 21:58
30	08:15 13:13-13:49/36 17:01		07:05 18:54-19:28/34 19:54	05:53 18:48-20:17/89 20:51	05:04 20:25-21:06/41 21:40 19:18-19:45/27	04:57 20:32-21:22/50 21:58
31	08:13 13:15-13:46/31 17:03		07:02 18:52-19:30/38 19:56		05:03 20:25-21:07/42 21:41 19:19-19:40/21	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	1867	172	1498	2245	2410	1510

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA06 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 20:32-21:22/50 21:57	05:38 20:39-20:51/12 21:22 19:10-20:14/64	06:31 18:39-19:48/69 20:16	07:24 08:03-08:51/48 19:03 17:55-18:19/24	07:22 16:53	08:17 12:34-13:42/68 16:09
2	04:59 20:33-21:22/49 21:57	05:39 20:40-20:49/9 21:21 19:09-20:18/69	06:33 18:38-19:45/67 20:14	07:26 08:02-08:50/48 19:01 17:54-18:20/26	07:24 16:51	08:18 12:34-13:43/69 16:08
3	05:00 20:32-21:21/49 21:57	05:41 20:43-20:48/5 21:19 19:09-20:20/71	06:35 18:38-19:43/65 20:12	07:28 08:02-08:50/48 18:58 17:53-18:21/28	07:26 16:49	08:20 12:34-13:43/69 16:08
4	05:00 20:33-21:21/48 21:56	05:43 19:09-20:22/73 21:17	06:37 18:39-19:41/62 20:09	07:30 08:02-08:51/49 18:56 17:53-18:21/28	07:28 16:47	08:21 12:35-13:44/69 16:07
5	05:01 20:33-21:20/47 21:56	05:44 19:08-20:23/75 21:15	06:38 18:38-19:38/60 20:07	07:31 08:02-08:51/49 18:53 17:52-18:21/29	07:30 16:45	08:22 12:34-13:44/70 16:06
6	05:02 20:33-21:20/47 21:55	05:46 19:08-20:24/76 21:13	06:40 18:39-19:36/57 20:04	07:33 08:03-08:50/47 18:51 17:52-18:21/29	07:32 16:43	08:24 12:35-13:45/70 16:06
7	05:03 20:33-21:19/46 21:54	05:48 19:07-20:24/77 21:11	06:42 18:39-19:34/55 20:02	07:35 08:04-08:50/46 18:49 17:51-18:19/28	07:34 16:42	08:25 12:35-13:45/70 16:05
8	05:04 20:33-21:19/46 21:54	05:49 19:07-20:25/78 21:09	06:44 18:39-19:31/52 20:00	07:37 08:03-08:49/46 18:46 17:51-18:17/26	07:36 12:59-13:05/6 16:40	08:26 12:36-13:47/71 16:05
9	05:05 20:33-21:18/45 21:53	05:51 19:07-20:26/79 21:07	06:45 18:40-19:29/49 19:57	07:39 08:05-08:48/43 18:44 17:51-18:15/24	07:37 12:52-13:11/19 16:38	08:28 12:36-13:47/71 16:05
10	05:06 20:33-21:18/45 21:52 19:33-19:43/10	05:53 19:04-20:26/82 21:05	06:47 18:41-19:27/46 19:55	07:41 08:07-08:48/41 18:41 17:51-18:12/21	07:39 12:48-13:15/27 16:36	08:29 12:36-13:47/71 16:04
11	05:07 20:33-21:17/44 21:51 19:30-19:45/15	05:55 19:01-20:26/85 21:03	06:49 18:42-19:24/42 19:52	07:42 08:09-08:47/38 18:39 17:51-18:10/19	07:41 12:45-13:17/32 16:35	08:30 12:36-13:47/71 16:04
12	05:09 20:33-21:16/43 21:50 19:29-19:47/18	05:56 18:57-20:26/89 21:01	06:51 18:43-19:22/39 19:50	07:44 08:11-08:46/35 18:37 17:52-18:08/16	07:43 12:43-13:20/37 16:33	08:31 12:38-13:49/71 16:04
13	05:10 20:33-21:15/42 21:49 19:27-19:51/24	05:58 18:56-20:26/90 20:59	06:52 18:45-19:19/34 19:47	07:46 08:13-08:45/32 18:34 17:53-18:05/12	07:45 12:43-13:22/39 16:31	08:32 12:38-13:49/71 16:04
14	05:11 20:33-21:14/41 21:48 19:25-19:55/30	06:00 18:54-20:26/92 20:57	06:54 18:47-19:15/28 19:45	07:48 08:15-08:43/28 18:32 17:55-18:03/8	07:47 12:41-13:24/43 16:30	08:33 12:38-13:50/72 16:04
15	05:12 20:33-21:13/40 21:47 19:24-19:57/33	06:02 18:52-20:25/93 20:55	06:56 18:49-19:11/22 19:42	07:50 08:17-08:42/25 18:30 17:56-18:01/5	07:49 12:40-13:26/46 16:28	08:34 12:39-13:50/71 16:04
16	05:13 20:33-21:12/39 21:46 19:22-19:59/37	06:03 18:51-20:23/92 20:53	06:58 18:53-19:07/14 19:40	07:52 08:19-08:40/21 18:27	07:51 12:39-13:28/49 16:27	08:35 12:39-13:51/72 16:04
17	05:15 20:33-21:11/38 21:45 19:22-20:01/39	06:05 18:50-20:22/92 20:51	06:59 08:25-08:32/7 19:37	07:53 08:21-08:37/16 18:25	07:53 12:38-13:29/51 16:25	08:36 12:39-13:50/71 16:04
18	05:16 20:33-21:10/37 21:44 19:21-20:02/41	06:07 18:48-20:19/91 20:49	07:01 08:20-08:37/17 19:35	07:55 08:23-08:33/10 18:23	07:54 12:37-13:31/54 16:24	08:37 12:40-13:51/71 16:04
19	05:18 20:33-21:09/36 21:42 19:20-20:03/43	06:09 18:47-20:17/90 20:46	07:03 08:16-08:39/23 19:33	07:57 18:21	07:56 12:36-13:32/56 16:22	08:37 12:40-13:52/72 16:04
20	05:19 20:34-21:08/34 21:41 19:19-20:05/46	06:10 18:46-20:15/89 20:44	07:05 08:14-08:41/27 19:30	07:59 18:18	07:58 12:36-13:33/57 16:21	08:38 12:40-13:52/72 16:05
21	05:20 20:34-21:07/33 21:40 19:18-20:06/48	06:12 18:44-20:13/89 20:42	07:06 08:12-08:42/30 19:28	08:01 18:16	08:00 12:35-13:34/59 16:20	08:39 12:41-13:53/72 16:05
22	05:22 20:33-21:05/32 21:38 19:17-20:07/50	06:14 18:44-20:11/87 20:40	07:08 08:10-08:44/34 19:25	08:03 18:14	08:02 12:35-13:35/60 16:18	08:39 12:41-13:53/72 16:06
23	05:23 20:34-21:04/30 21:37 19:17-20:08/51	06:16 18:43-20:09/86 20:37	07:10 08:08-08:44/36 19:23	08:05 18:12	08:03 12:35-13:36/61 16:17	08:40 12:42-13:54/72 16:06
24	05:25 20:34-21:03/29 21:36 19:15-20:09/54	06:17 18:42-20:06/84 20:35	07:12 08:07-08:45/38 19:20	08:07 18:10	08:05 12:35-13:37/62 16:16	08:40 12:42-13:54/72 16:07
25	05:26 20:34-21:02/28 21:34 19:15-20:10/55	06:19 18:41-20:04/83 20:33	07:14 08:06-08:45/39 19:18	07:09 17:07	08:07 12:34-13:37/63 16:15	08:40 12:43-13:54/71 16:07
26	05:28 20:35-21:00/25 21:33 19:14-20:10/56	06:21 18:41-20:02/81 20:30	07:15 08:06-08:47/41 19:15	07:10 17:05	08:09 12:34-13:38/64 16:14	08:41 12:44-13:55/71 16:08
27	05:29 20:35-20:58/23 21:31 19:13-20:11/58	06:23 18:40-19:59/79 20:28	07:17 08:04-08:48/44 19:13	07:12 17:03	08:10 12:34-13:39/65 16:13	08:41 12:44-13:56/72 16:09
28	05:31 20:36-20:57/21 21:29 19:13-20:12/59	06:24 18:40-19:57/77 20:26	07:19 08:04-08:49/45 19:10 18:03-18:15/12	07:14 17:01	08:12 12:34-13:40/66 16:12	08:41 12:45-13:56/71 16:10
29	05:33 20:36-20:55/19 21:28 19:12-20:12/60	06:26 18:40-19:55/75 20:23	07:21 08:03-08:50/47 19:08 18:00-18:17/17	07:16 16:59	08:13 12:34-13:41/67 16:11	08:41 12:45-13:56/71 16:11
30	05:34 20:37-20:54/17 21:26 19:11-20:13/62	06:28 18:39-19:52/73 20:21	07:22 08:03-08:50/47 19:06 17:58-18:19/21	07:18 16:57	08:15 12:34-13:41/67 16:10	08:41 12:46-13:57/71 16:12
31	05:36 20:38-20:52/14 21:24 19:10-20:13/63	06:30 18:39-19:50/71 20:19		07:20 16:55		08:41 12:46-13:57/71 16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	2089	2558	1286	993	1150	2198

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA07 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April	Mai	Juni	Juli	August	September		Oktober		November	Dezember
1	08:41	08:12	07:14		07:00	05:51	05:02	04:58	05:38	06:32		07:24	18:05-18:26/21	07:22	08:17
	16:14	17:05	18:00		19:58	20:53	21:43	21:57	21:23	20:16		19:03		16:53	16:09
2	08:41	08:10	07:12	17:32-17:35/3	06:57	05:49	05:01	04:59	05:39	06:33		07:26	18:04-18:26/22	07:24	08:18
	16:15	17:07	18:02		20:00	20:55	21:44	21:57	21:21	20:14		19:01		16:51	16:08
3	08:41	08:08	07:10	17:30-17:37/7	06:55	05:47	05:00	05:00	05:41	06:35		07:28	18:03-18:27/24	07:26	08:20
	16:16	17:09	18:04		20:02	20:57	21:45	21:57	21:19	20:12		18:58		16:49	16:08
4	08:41	08:06	07:08	17:29-17:39/10	06:53	05:45	05:00	05:01	05:43	06:37		07:30	18:03-18:27/24	07:28	08:21
	16:18	17:11	18:06		20:04	20:59	21:46	21:56	21:17	20:09		18:56		16:47	16:07
5	08:40	08:05	07:05	17:27-17:41/14	06:50	05:43	04:59	05:01	05:44	06:39		07:32	18:03-18:25/22	07:30	08:23
	16:19	17:13	18:08		20:06	21:00	21:47	21:56	21:15	20:07		18:54		16:45	16:07
6	08:40	08:03	07:03	17:27-17:43/16	06:48	05:41	04:58	05:02	05:46	06:40		07:33	18:03-18:23/20	07:32	08:24
	16:20	17:15	18:10		20:07	21:02	21:48	21:55	21:13	20:04		18:51		16:44	16:06
7	08:40	08:01	07:00	17:26-17:44/18	06:45	05:39	04:57	05:03	05:48	06:42		07:35	18:03-18:20/17	07:34	08:25
	16:21	17:17	18:12		20:09	21:04	21:49	21:54	21:11	20:02		18:49		16:42	16:06
8	08:39	07:59	06:58	17:26-17:47/21	06:43	05:37	04:57	05:04	05:50	06:44		07:37	18:02-18:17/15	07:36	08:26
	16:23	17:19	18:14		20:11	21:06	21:50	21:54	21:09	20:00		18:46		16:40	16:05
9	08:39	07:57	06:56	17:26-17:49/23	06:41	05:35	04:56	05:05	05:51	06:46		07:39	18:03-18:15/12	07:38	08:28
	16:24	17:21	18:16		20:13	21:07	21:51	21:53	21:07	19:57		18:44		16:38	16:05
10	08:38	07:55	06:53	17:25-17:49/24	06:38	05:34	04:56	05:06	05:53	06:47		07:41	18:03-18:12/9	07:39	08:29
	16:26	17:23	18:17		20:15	21:09	21:52	21:52	21:05	19:55		18:42		16:36	16:04
11	08:37	07:53	06:51	17:26-17:49/23	06:36	05:32	04:55	05:08	05:55	06:49		07:42	18:05-18:10/5	07:41	08:30
	16:27	17:25	18:19		20:17	21:11	21:53	21:51	21:03	19:52		18:39		16:35	16:04
12	08:37	07:51	06:49	17:26-17:47/21	06:34	05:30	04:55	05:09	05:56	06:51		07:44	18:07-18:08/1	07:43	08:31
	16:29	17:27	18:21		20:18	21:13	21:54	21:50	21:01	19:50		18:37		16:33	16:04
13	08:36	07:49	06:46	17:27-17:46/19	06:31	05:28	04:55	05:10	05:58	06:53		07:46		07:45	08:32
	16:30	17:29	18:23		20:20	21:14	21:54	21:49	20:59	19:47		18:35		16:31	16:04
14	08:35	07:47	06:44	17:28-17:44/16	06:29	05:27	04:54	05:11	06:00	06:54		07:48		07:47	08:33
	16:32	17:31	18:25		20:22	21:16	21:55	21:48	20:57	19:45		18:32		16:30	16:04
15	08:34	07:45	06:41	17:30-17:42/12	06:27	05:25	04:54	05:12	06:02	06:56		07:50		07:49	08:34
	16:34	17:33	18:27		20:24	21:18	21:55	21:47	20:55	19:43		18:30		16:28	16:04
16	08:33	07:43	06:39	17:33-17:37/4	06:24	05:23	04:54	05:14	06:03	06:58		07:52		07:51	08:35
	16:35	17:35	18:29		20:26	21:19	21:56	21:46	20:53	19:40		18:28		16:27	16:04
17	08:32	07:41	06:36		06:22	05:22	04:54	05:15	06:05	07:00		07:54		07:53	08:36
	16:37	17:37	18:31		20:28	21:21	21:57	21:45	20:51	19:38		18:25		16:25	16:04
18	08:31	07:39	06:34		06:20	05:20	04:54	05:16	06:07	07:01		07:55		07:54	08:37
	16:39	17:39	18:32		20:29	21:23	21:57	21:44	20:49	19:35		18:23		16:24	16:04
19	08:30	07:37	06:32		06:17	05:18	04:54	05:18	06:09	07:03		07:57		07:56	08:37
	16:41	17:41	18:34		20:31	21:24	21:57	21:43	20:46	19:33		18:21		16:22	16:05
20	08:29	07:35	06:29		06:15	05:17	04:54	05:19	06:10	07:05		07:59		07:58	08:38
	16:42	17:43	18:36		20:33	21:26	21:58	21:41	20:44	19:30		18:19		16:21	16:05
21	08:28	07:32	06:27		06:13	05:15	04:54	05:21	06:12	07:07		08:01		08:00	08:39
	16:44	17:45	18:38		20:35	21:27	21:58	21:40	20:42	19:28		18:16		16:20	16:05
22	08:26	07:30	06:24		06:11	05:14	04:54	05:22	06:14	07:08		08:03		08:02	08:39
	16:46	17:47	18:40		20:37	21:29	21:58	21:38	20:40	19:25		18:14		16:18	16:06
23	08:25	07:28	06:22		06:08	05:13	04:54	05:24	06:16	07:10		08:05		08:03	08:40
	16:48	17:49	18:42		20:39	21:30	21:58	21:37	20:37	19:23		18:12		16:17	16:06
24	08:24	07:26	06:19		06:06	05:11	04:55	05:25	06:17	07:12		08:07		08:05	08:40
	16:50	17:51	18:44		20:40	21:32	21:58	21:36	20:35	19:20		18:10		16:16	16:07
25	08:22	07:24	06:17		06:04	05:10	04:55	05:27	06:19	07:14		07:09		08:07	08:41
	16:51	17:53	18:45		20:42	21:33	21:58	21:34	20:33	19:18		17:08		16:15	16:08
26	08:21	07:21	06:15		06:02	05:09	04:55	05:28	06:21	07:15		07:11		08:09	08:41
	16:53	17:54	18:47		20:44	21:35	21:58	21:33	20:31	19:15		17:05		16:14	16:08
27	08:19	07:19	06:12		06:00	05:08	04:56	05:30	06:23	07:17		07:12		08:10	08:41
	16:55	17:56	18:49		20:46	21:36	21:58	21:31	20:28	19:13		17:03		16:13	16:09
28	08:18	07:17	06:10		05:57	05:06	04:56	05:31	06:25	07:19	18:12-18:22/10	07:14		08:12	08:41
	16:57	17:58	18:51		20:48	21:38	21:58	21:29	20:26	19:11		17:01		16:12	16:10
29	08:16		07:07		05:55	05:05	04:57	05:33	06:26	07:21	18:09-18:24/15	07:16		08:14	08:41
	16:59		19:53		20:50	21:39	21:58	21:28	20:24	19:08		16:59		16:11	16:11
30	08:15		07:05		05:53	05:04	04:58	05:34	06:28	07:23	18:07-18:26/19	07:18		08:15	08:41
	17:01		19:55		20:51	21:40	21:58	21:26	20:21	19:06		16:57		16:10	16:12
31	08:13		07:02			05:03		05:36	06:30			07:20			08:41
	17:03		19:56			21:41		21:24	20:19			16:55			16:13
Sonnenscheinstunden	251	274	367		420	493	509	511	459	382		329		260	234
Anzahl Minuten mit Schatten	0	0	231		0	0	0	0	0	44		192		0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA08 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:14 17:30-17:33/3	07:00	05:51	05:02	04:58	05:38	06:32	07:24 17:55-18:34/39	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12 17:26-17:35/9	06:57	05:49	05:01	04:59	05:39	06:33	07:26 17:55-18:32/37	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10 17:24-17:37/13	06:55	05:47	05:00	05:00	05:41	06:35	07:28 17:54-18:30/36	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08 17:22-17:39/17	06:53	05:45	04:59	05:01	05:43	06:37	07:30 17:54-18:27/33	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05 17:20-17:41/21	06:50	05:43	04:59	05:01	05:44	06:39	07:32 17:54-18:25/31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03 17:20-17:43/23	06:48	05:41	04:58	05:02	05:46	06:40	07:33 17:55-18:23/28	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00 17:18-17:44/26	06:45	05:39	04:57	05:03	05:48	06:42	07:35 17:55-18:20/25	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58 17:18-17:47/29	06:43	05:37	04:57	05:04	05:50	06:44	07:37 17:55-18:17/22	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56 17:18-17:49/31	06:41	05:35	04:56	05:05	05:51	06:46	07:39 17:56-18:15/19	07:37	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53 17:17-17:51/34	06:38	05:34	04:56	05:06	05:53	06:47	07:41 17:57-18:12/15	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51 17:17-17:53/36	06:36	05:32	04:55	05:08	05:55	06:49	07:42 17:58-18:10/12	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49 17:16-17:54/38	06:34	05:30	04:55	05:09	05:56	06:51	07:44 18:01-18:08/7	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46 17:16-17:57/41	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44 17:16-17:58/42	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41 17:17-17:58/41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39 17:17-17:58/41	06:24	05:23	04:54	05:14	06:03	06:58 18:20-18:34/14	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:36 17:18-17:58/40	06:22	05:22	04:54	05:15	06:05	07:00 18:17-18:36/19	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34 17:20-17:58/38	06:20	05:20	04:54	05:16	06:07	07:01 18:15-18:38/23	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32 17:21-17:57/36	06:17	05:18	04:54	05:18	06:09	07:03 18:12-18:38/26	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29 17:23-17:57/34	06:15	05:17	04:54	05:19	06:10	07:05 18:11-18:40/29	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:32	06:27 17:23-17:56/33	06:13	05:15	04:54	05:21	06:12	07:07 18:09-18:40/31	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24 17:24-17:55/31	06:11	05:14	04:54	05:22	06:14	07:08 18:08-18:40/32	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22 17:24-17:53/29	06:08	05:13	04:54	05:23	06:16	07:10 18:07-18:40/33	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19 17:25-17:52/27	06:06	05:11	04:55	05:25	06:17	07:12 18:05-18:41/36	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17 17:26-17:50/24	06:04	05:10	04:55	05:27	06:19	07:14 18:03-18:41/38	07:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:14 17:28-17:48/20	06:02	05:09	04:55	05:28	06:21	07:15 18:02-18:41/39	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12 17:30-17:45/15	06:00	05:07	04:56	05:30	06:23	07:17 17:59-18:40/41	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10 17:35-17:40/5	05:57	05:06	04:56	05:31	06:24	07:19 17:58-18:39/41	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21 17:57-18:39/42	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23 17:57-18:37/40	07:18	08:15	08:41
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	777	0	0	0	0	0	484	304	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA09 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 16:14	08:11 17:05	07:14 16:49-17:23/34 18:00	07:00 18:59-19:22/23 19:58	05:51 18:51-20:02/71 20:53	05:02 18:55-20:45/110 21:43
2	08:41 16:15	08:10 17:07	07:12 16:49-17:21/32 18:02	06:57 19:01-19:20/19 20:00	05:49 18:51-20:02/71 20:55	05:01 18:57-20:46/109 21:44
3	08:41 16:16	08:08 17:09	07:10 16:50-17:21/31 18:04	06:55 19:04-19:17/13 20:02	05:47 18:50-20:02/72 20:57	05:00 18:57-20:47/110 21:45
4	08:41 16:17	08:06 16:38-16:39/1 17:11	07:07 16:51-17:20/29 18:06	06:53 20:04	05:45 18:50-20:02/72 20:58	04:59 18:57-20:47/110 21:46
5	08:40 16:19	08:05 16:38-16:42/4 17:13	07:05 16:51-17:19/28 18:08	06:50 20:06	05:43 18:49-20:02/73 21:00	04:59 18:58-20:48/1[illegible] 21:47
6	08:40 16:20	08:03 16:37-16:44/7 17:15	07:03 16:52-17:18/26 18:10	06:48 20:07	05:41 18:49-20:02/73 21:02	04:58 18:58-20:48/110 21:48
7	08:40 16:21	08:01 16:36-16:47/11 17:17	07:00 16:53-17:15/22 18:12	06:45 20:09	05:39 18:48-20:02/74 21:04	04:57 18:59-20:49/110 21:49
8	08:39 16:23	07:59 16:35-16:49/14 17:19	06:58 16:56-17:13/17 18:14	06:43 20:11	05:37 18:49-20:03/74 21:06	04:57 18:59-20:49/110 21:50
9	08:39 16:24	07:57 16:35-16:51/16 17:21	06:56 17:00-17:10/10 18:16	06:41 20:13	05:35 18:49-20:15/86 21:07	04:56 19:00-20:49/109 21:51
10	08:38 16:26	07:55 16:33-16:52/19 17:23	06:53 18:17	06:38 20:15	05:34 18:48-20:19/91 21:09	04:56 19:00-20:49/109 21:52
11	08:37 16:27	07:53 16:33-16:55/22 17:25	06:51 17:52-17:53/1 18:19	06:36 20:17	05:32 18:49-20:23/94 21:11	04:55 19:01-20:50/109 21:53
12	08:36 16:29	07:51 16:33-16:57/24 17:27	06:48 17:49-17:54/5 18:21	06:33 20:18	05:30 18:49-20:25/96 21:13	04:55 19:02-20:50/108 21:54
13	08:36 16:30	07:49 16:34-16:59/25 17:29	06:46 17:48-17:57/9 18:23	06:31 19:24-19:36/12 20:20	05:28 18:48-20:27/99 21:14	04:54 19:01-20:50/109 21:54
14	08:35 16:32	07:47 16:34-17:01/27 17:31	06:44 17:46-17:58/12 18:25	06:29 19:18-19:42/24 20:22	05:26 18:49-20:29/100 21:16	04:54 19:02-20:51/109 21:55
15	08:34 16:34	07:45 16:34-17:04/30 17:33	06:41 17:46-18:00/14 18:27	06:26 19:13-19:45/32 20:24	05:25 18:49-20:30/101 21:18	04:54 19:02-20:51/109 21:55
16	08:33 16:35	07:43 16:35-17:06/31 17:35	06:39 17:45-18:02/17 18:29	06:24 19:11-19:47/36 20:26	05:23 18:49-20:32/103 21:19	04:54 19:03-20:51/108 21:56
17	08:32 16:37	07:41 16:35-17:07/32 17:37	06:36 17:45-18:04/19 18:31	06:22 19:08-19:50/42 20:28	05:21 18:49-20:33/104 21:21	04:54 19:03-20:52/109 21:56
18	08:31 16:39	07:39 16:36-17:10/34 17:39	06:34 17:44-18:05/21 18:32	06:20 19:06-19:52/46 20:29	05:20 18:50-20:35/105 21:23	04:54 19:03-20:52/109 21:57
19	08:30 16:40	07:37 16:38-17:12/34 17:41	06:32 17:44-18:08/24 18:34	06:17 19:03-19:52/49 20:31	05:18 18:50-20:36/106 21:24	04:54 19:04-20:52/108 21:57
20	08:29 16:42	07:35 16:40-17:15/35 17:43	06:29 17:45-18:10/25 18:36	06:15 19:02-19:54/52 20:33	05:17 18:50-20:37/107 21:26	04:54 19:04-20:52/10[illegible] 21:58
21	08:27 16:44	07:32 16:40-17:16/36 17:45	06:27 17:45-18:11/26 18:38	06:13 19:00-19:55/55 20:35	05:15 18:51-20:38/107 21:27	04:54 19:04-20:53/109 21:58
22	08:26 16:46	07:30 16:41-17:18/37 17:47	06:24 17:46-18:14/28 18:40	06:10 18:59-19:56/57 20:37	05:14 18:51-20:39/108 21:29	04:54 19:05-20:53/108 21:58
23	08:25 16:48	07:28 16:43-17:21/38 17:49	06:22 17:47-18:15/28 18:42	06:08 18:58-19:57/59 20:39	05:13 18:51-20:39/108 21:30	04:54 19:05-20:53/108 21:58
24	08:24 16:50	07:26 16:45-17:23/38 17:50	06:19 17:50-18:17/27 18:43	06:06 18:57-19:58/61 20:40	05:11 18:52-20:40/108 21:32	04:55 19:04-20:53/109 21:58
25	08:22 16:51	07:24 16:47-17:23/36 17:52	06:17 17:57-18:19/22 18:45	06:04 18:56-19:59/63 20:42	05:10 18:52-20:41/109 21:33	04:55 19:05-20:54/109 21:58
26	08:21 16:53	07:21 16:49-17:23/34 17:54	06:14 17:57-18:21/24 18:47	06:02 18:55-20:00/65 20:44	05:09 18:53-20:42/109 21:35	04:55 19:05-20:53/108 21:58
27	08:19 16:55	07:19 16:49-17:24/35 17:56	06:12 17:57-18:22/25 18:49	06:00 18:54-20:00/66 20:46	05:07 18:53-20:43/110 21:36	04:56 19:05-20:54/109 21:58
28	08:18 16:57	07:17 16:49-17:23/34 17:58	06:10 17:57-18:24/27 18:51	05:57 18:53-20:01/68 20:48	05:06 18:54-20:43/109 21:37	04:56 19:05-20:54/109 21:58
29	08:16 16:59		07:07 18:57-19:25/28 19:53	05:55 18:53-20:01/68 20:49	05:05 18:54-20:44/110 21:39	04:57 19:05-20:54/109 21:58
30	08:15 17:01		07:05 18:58-19:24/26 19:55	05:53 18:52-20:02/70 20:51	05:04 18:55-20:44/109 21:40	04:57 19:05-20:54/109 21:58
31	08:13 17:03		07:02 18:59-19:24/25 19:56		05:03 18:55-20:45/110 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	0	654	662	980	2969	3270

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung **WEA:** WEA09 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
416	325	436	700	576	567	910	1.069	1.133	944	728	505	8.309

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 19:05-20:54/109 21:57	05:38 18:59-20:35/96 21:23	06:31 20:16	07:24 18:27-18:34/7 19:03	07:22 16:03-16:22/19 16:53	08:17 16:09
2	04:59 19:05-20:54/109 21:57	05:39 18:59-20:32/93 21:21	06:33 20:14	07:26 18:29-18:32/3 19:01	07:24 16:03-16:19/16 16:51	08:18 16:08
3	05:00 19:05-20:54/109 21:57	05:41 18:59-20:28/89 21:19	06:35 20:12	07:28 18:58	07:26 16:04-16:17/13 16:49	08:20 16:08
4	05:00 19:05-20:54/109 21:56	05:43 18:59-20:23/84 21:17	06:37 20:09	07:30 17:40-17:43/3 18:56	07:28 16:06-16:16/10 16:47	08:21 16:07
5	05:01 19:05-20:54/109 21:56	05:44 18:58-20:12/74 21:15	06:38 20:07	07:31 17:34-17:49/15 18:53	07:30 16:06-16:14/8 16:45	08:22 16:06
6	05:02 19:05-20:54/109 21:55	05:46 18:59-20:13/74 21:13	06:40 20:04	07:33 17:31-17:51/20 18:51	07:32 16:08-16:12/4 16:43	08:24 16:06
7	05:03 19:05-20:54/109 21:54	05:48 18:58-20:12/74 21:11	06:42 20:02	07:35 17:29-17:53/24 18:49	07:34 16:09-16:10/1 16:42	08:25 16:05
8	05:04 19:04-20:54/110 21:54	05:49 18:59-20:12/73 21:09	06:44 20:00	07:37 17:27-17:53/26 18:46	07:36 16:40	08:26 16:05
9	05:05 19:04-20:54/110 21:53	05:51 18:59-20:12/73 21:07	06:45 18:58-19:11/13 19:57	07:39 17:25-17:54/29 18:44	07:37 16:38	08:28 16:05
10	05:06 19:04-20:54/110 21:52	05:53 18:59-20:11/72 21:05	06:47 18:55-19:13/18 19:55	07:41 17:24-17:55/31 18:42	07:39 16:36	08:29 16:04
11	05:07 19:04-20:54/110 21:51	05:55 18:59-20:11/72 21:03	06:49 18:52-19:14/22 19:52	07:42 17:23-17:55/32 18:39	07:41 16:35	08:30 16:04
12	05:09 19:04-20:53/109 21:50	05:56 19:00-20:10/70 21:01	06:51 18:50-19:15/25 19:50	07:44 17:23-17:56/33 18:37	07:43 16:33	08:31 16:04
13	05:10 19:03-20:53/110 21:49	05:58 19:00-20:09/69 20:59	06:52 18:49-19:15/26 19:47	07:46 17:22-17:56/34 18:34	07:45 16:31	08:32 16:04
14	05:11 19:03-20:53/110 21:48	06:00 19:00-20:09/69 20:57	06:54 18:48-19:16/28 19:45	07:48 17:22-17:56/34 18:32	07:47 16:30	08:33 16:04
15	05:12 19:02-20:52/110 21:47	06:02 19:00-20:07/67 20:55	06:56 18:47-19:14/27 19:42	07:50 17:21-17:56/35 18:30	07:49 16:28	08:34 16:04
16	05:14 19:03-20:52/109 21:46	06:03 19:01-20:07/66 20:53	06:58 18:46-19:12/26 19:40	07:52 17:21-17:56/35 18:28	07:51 16:27	08:35 16:04
17	05:15 19:02-20:52/110 21:45	06:05 19:02-20:06/64 20:51	06:59 18:46-19:10/24 19:38	07:54 17:18-17:55/37 18:25	07:53 16:25	08:36 16:04
18	05:16 19:02-20:51/109 21:44	06:07 19:02-20:05/63 20:49	07:01 18:45-19:07/22 19:35	07:55 17:15-17:54/39 18:23	07:54 16:24	08:37 16:04
19	05:18 19:01-20:50/109 21:42	06:09 19:03-20:04/61 20:46	07:03 18:37-19:04/27 19:33	07:57 17:14-17:51/37 18:21	07:56 16:22	08:37 16:05
20	05:19 19:02-20:50/108 21:41	06:10 19:04-20:03/59 20:44	07:05 18:34-19:02/28 19:30	07:59 17:12-17:49/37 18:18	07:58 16:21	08:38 16:05
21	05:20 19:01-20:49/108 21:40	06:12 19:04-20:01/57 20:42	07:07 18:32-19:00/28 19:28	08:01 17:11-17:47/36 18:16	08:00 16:20	08:39 16:05
22	05:22 19:01-20:48/107 21:38	06:14 19:05-20:00/55 20:40	07:08 18:30-18:57/27 19:25	08:03 17:10-17:44/34 18:14	08:02 16:18	08:39 16:06
23	05:23 19:01-20:48/107 21:37	06:16 19:07-19:58/51 20:37	07:10 18:29-18:54/25 19:23	08:05 17:08-17:42/34 18:12	08:03 16:17	08:40 16:06
24	05:25 19:00-20:47/107 21:36	06:17 19:07-19:56/49 20:35	07:12 18:28-18:52/24 19:20	08:07 17:06-17:40/34 18:10	08:05 16:16	08:40 16:07
25	05:26 19:01-20:46/105 21:34	06:19 19:09-19:54/45 20:33	07:14 18:28-18:50/22 19:18	07:09 16:05-16:37/32 17:08	08:07 16:15	08:40 16:08
26	05:28 19:00-20:45/105 21:33	06:21 19:11-19:52/41 20:30	07:15 18:26-18:47/21 19:15	07:11 16:04-16:35/31 17:05	08:09 16:14	08:41 16:08
27	05:30 18:59-20:43/104 21:31	06:23 19:13-19:49/36 20:28	07:17 18:26-18:44/18 19:13	07:12 16:04-16:33/29 17:03	08:10 16:13	08:41 16:09
28	05:31 19:00-20:42/102 21:29	06:24 19:16-19:46/30 20:26	07:19 18:26-18:42/16 19:10	07:14 16:03-16:30/27 17:01	08:12 16:12	08:41 16:10
29	05:33 18:59-20:40/101 21:28	06:26 19:19-19:43/24 20:24	07:21 18:27-18:40/13 19:08	07:16 16:03-16:28/25 16:59	08:13 16:11	08:41 16:11
30	05:34 18:59-20:39/100 21:26	06:28 19:25-19:35/10 20:21	07:22 18:27-18:37/10 19:06	07:18 16:03-16:26/23 16:57	08:15 16:10	08:41 16:12
31	05:36 18:59-20:36/97 21:24	06:30 20:19		07:20 16:03-16:24/21 16:55		08:41 16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	3330	1860	490	837	71	0

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

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

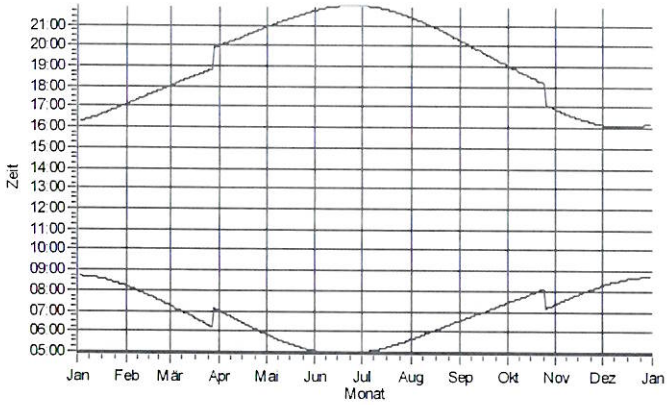
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

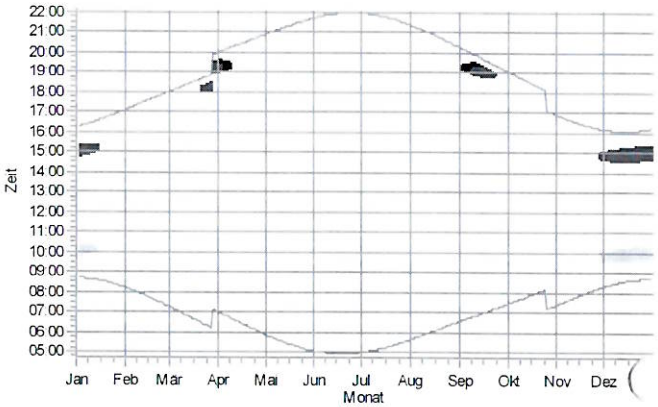
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung

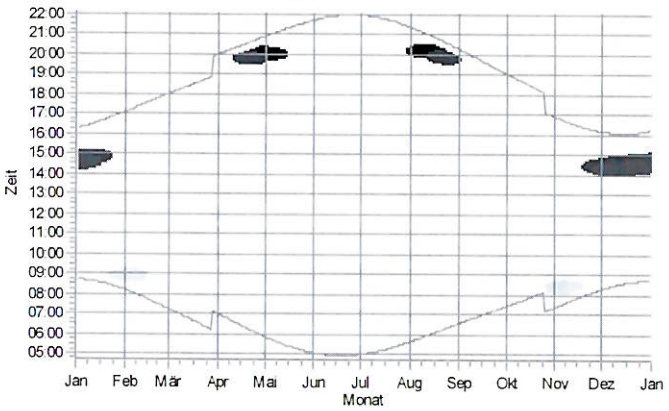
WEA01: E-138 EP3 E3



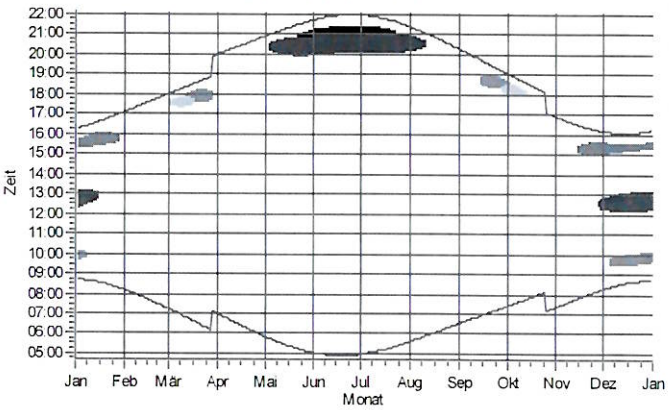
WEA02: E-175 EP5



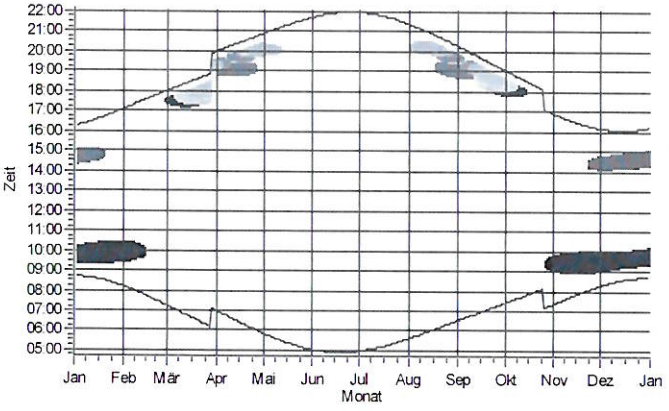
WEA03: E-175 EP5



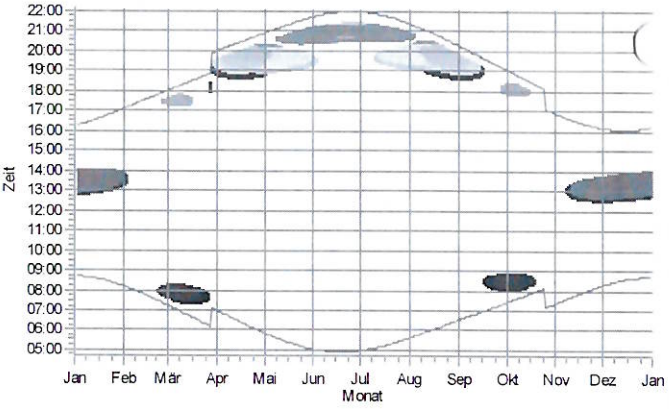
WEA04: E-175 EP5



WEA05: E-175 EP5



WEA06: E-175 EP5



Schattenrezeptoren

- IP02: Neues Moor 21, 21770 Mittelstenahe
- IP03: Mittelstenaher Str. 30, 21769 Lamstedt
- IP04: Wischhofstraße 10, 21769 Lamstedt
- IP05: Am Kamp 26, 21769 Lamstedt
- IP06: Strother Heuweg 5, 21769 Lamstedt
- IP07: Driftweg 2, 21769 Lamstedt
- IP08: Haneworth 1, 21770 Lamstedt
- IP09: Sticht 5, 21770 Mittelstenahe
- IP11: Auf dem Kampen 2, 21769 Lamstedt
- IP12: Auf dem Kampen 6, 21769 Lamstedt
- IP13: Auf dem Kampen 5, 21769 Lamstedt
- IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt
- IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt
- IP16: Kleiner Koven 15A, 21769 Lamstedt
- IP17: An der Gosche 10, 21769 Lamstedt
- IP18: Wischhofstraße 17a, 21769 Lamstedt
- IP19: Wischhofstraße 15, 21769 Lamstedt
- IP20: Wischhofstraße 13, 21769 Lamstedt
- IP21: Auf der Stroth 18, 21769 Lamstedt
- IP22: Auf der Stroth 24, 21769 Lamstedt
- IP23: Auf der Stroth 20, 21769 Lamstedt
- IP24: Auf der Stroth 23, 21769 Lamstedt
- IP25: Auf der Stroth 21, 21769 Lamstedt
- IP26: Auf der Stroth 25, 21769 Lamstedt
- IP27: Strother Heuweg 1, 21769 Lamstedt
- IP28: Strother Heuweg 9, 21769 Lamstedt
- IP30: Pappelweg 7, 21769 Lamstedt
- IP31: Jochensweg 8, 21769 Lamstedt
- IP32: Driftweg 1, 21769 Lamstedt
- IP35: Neues Moor 19, 21770 Mittelstenahe
- IP36: Haneworth 2, 21770 Lamstedt
- IP37: Mittelstenaher Str. 32, 21769 Lamstedt

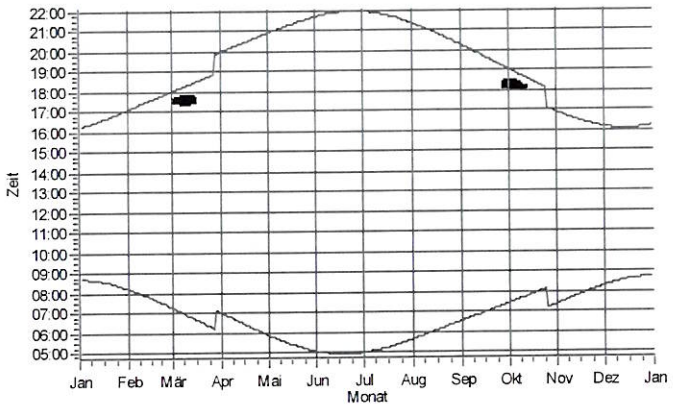
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

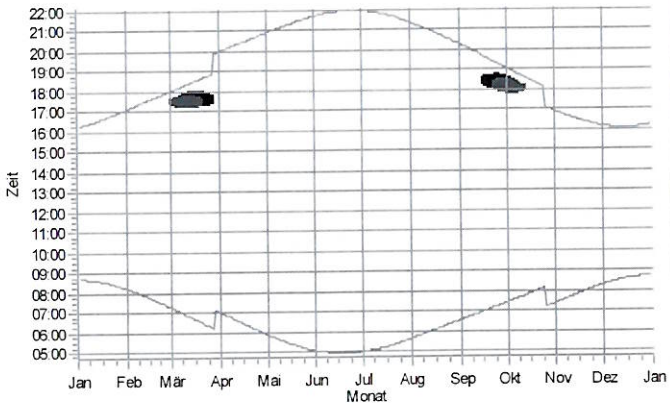
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung

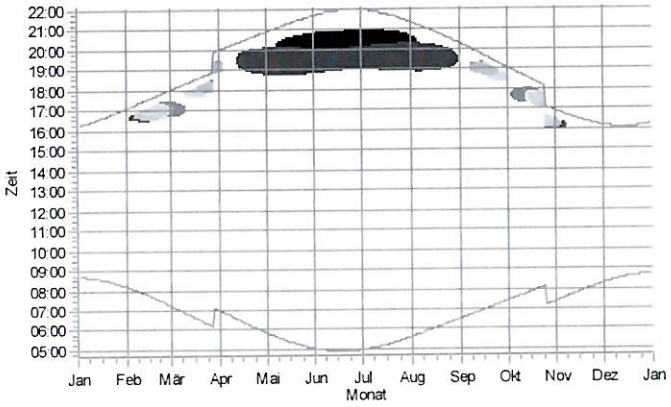
WEA07: E-175 EP5



WEA08: E-175 EP5



WEA09: E-175 EP5



Schattenrezeptoren

- IP04: Wischhofstraße 10, 21769 Lamstedt
- IP06: Strother Heuweg 5, 21769 Lamstedt
- IP07: Driftweg 2, 21769 Lamstedt
- IP11: Auf dem Kampen 2, 21769 Lamstedt
- IP12: Auf dem Kampen 6, 21769 Lamstedt
- IP13: Auf dem Kampen 5, 21769 Lamstedt
- IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt
- IP18: Wischhofstraße 17a, 21769 Lamstedt
- IP22: Auf der Stroth 24, 21769 Lamstedt
- IP27: Strother Heuweg 1, 21769 Lamstedt
- IP28: Strother Heuweg 9, 21769 Lamstedt
- IP32: Driftweg 1, 21769 Lamstedt

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

Annahmen für Schattenwurfberechnung

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

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

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

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

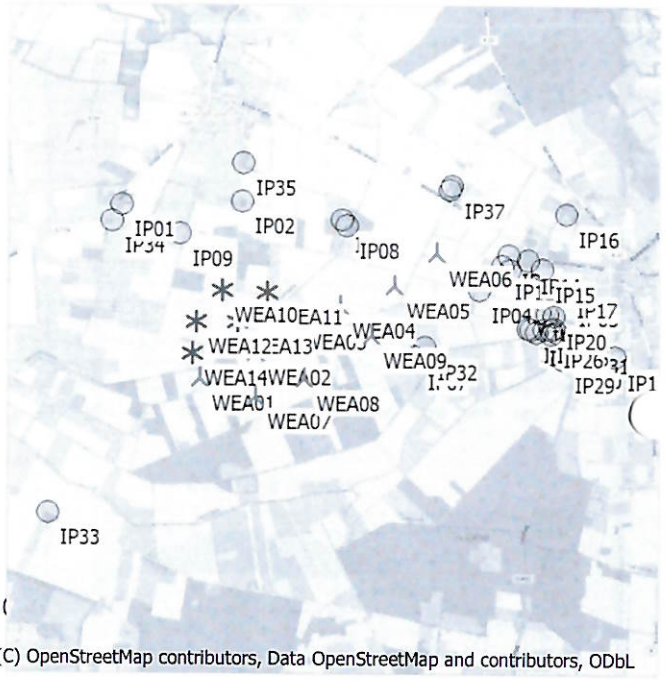
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Monatliche Aggregation der met. wahrsch. Reduzierung
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie
Eine WEA wird nicht berücksichtigt, wenn sie von keinem Teil der Rezeptorfläche aus sichtbar ist. Die Sichtbarkeitsberechnung basiert auf den folgenden Annahmen:
Verwendete Höhenlinien: Höhenlinien: CONTOURLINE_ONLINEDATA_4.wpo (
Rasterauflösung: 1,0 m

Alle Koordinatenangaben in:
UTM (north)-WGS84 Zone: 32



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

Maßstab 1:75.000
Neue WEA Existierende WEA Schattenrezeptor

WEA

	Ost	Nord	Z	Beschreibung	WEA-Typ Aktuell	Hersteller	Typ	Nenn-leistung	Rotor-durch-messer	NH	Schattendaten Beschatt.-Bereich	U/min
			[m]					[kW]	[m]	[m]	[m]	[U/min]
WEA01	502.184	5.941.963	10,0	E-138 EP3 E3	Ja	ENERCON	E-138 EP3 E3-4.260	4.260	138,3	160,0	1.686	11,1
WEA02	502.734	5.942.224	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA03	503.091	5.942.569	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA04	503.576	5.942.681	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA05	504.117	5.942.884	16,1	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA06	504.540	5.943.220	19,4	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA07	502.739	5.941.776	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA08	503.226	5.941.962	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA09	503.899	5.942.394	15,0	E-175 EP5	Ja	ENERCON	E-175 EP5-6.000	6.000	175,0	132,5	1.739	9,0
WEA10	502.407	5.942.842	11,5	E-70 E4 (M2)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA11	502.853	5.942.821	15,0	E-70 E4 (M3)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA12	502.153	5.942.521	10,0	E-70 E4 (M5)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA13	502.556	5.942.520	13,2	E-70 E4 (M6)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0
WEA14	502.117	5.942.205	10,0	E-70 E4 (M8)	Ja	ENERCON	E-70 E4 2,3 MW-2.300	2.300	71,0	132,5	1.640	20,0

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]
IP01	Sticht 1, 21770 Mittelstenahe	501.403	5.943.685	6,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP02	Neues Moor 21, 21770 Mittelstenahe	502.603	5.943.715	14,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	504.678	5.943.843	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP04	Wischhofstraße 10, 21769 Lamstedt	504.978	5.942.861	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP05	Am Kamp 26, 21769 Lamstedt	505.844	5.942.823	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP06	Strother Heuweg 5, 21769 Lamstedt	505.494	5.942.456	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP07	Driftweg 2, 21769 Lamstedt	504.337	5.942.185	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP08	Haneworth 1, 21770 Lamstedt	503.644	5.943.478	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP09	Sticht 5, 21770 Mittelstenahe	501.992	5.943.402	10,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	Ost	Nord	Z	Breite	Höhe	Höhe ü.Gr.	Neigung des Fensters	Ausrichtungsmodus	Augenhöhe (ZVI) ü.Gr.
				[m]	[m]	[m]	[m]	[°]		[m]
IP10	Falkenhorst 1, 21769 Lamstedt	506.341	5.942.196	21,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP11	Auf dem Kampen 2, 21769 Lamstedt	505.268	5.943.197	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP12	Auf dem Kampen 6, 21769 Lamstedt	505.196	5.943.098	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP13	Auf dem Kampen 5, 21769 Lamstedt	505.283	5.943.049	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	505.463	5.943.154	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	505.611	5.943.064	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP16	Kleiner Köven 15A, 21769 Lamstedt	505.846	5.943.604	25,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP17	An der Gösche 10, 21769 Lamstedt	505.826	5.942.915	20,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP18	Wischhofstraße 17a, 21769 Lamstedt	505.581	5.942.633	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP19	Wischhofstraße 15, 21769 Lamstedt	505.655	5.942.613	18,4	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP20	Wischhofstraße 13, 21769 Lamstedt	505.719	5.942.593	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP21	Auf der Stroth 18, 21769 Lamstedt	505.723	5.942.470	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP22	Auf der Stroth 24, 21769 Lamstedt	505.616	5.942.457	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP23	Auf der Stroth 20, 21769 Lamstedt	505.691	5.942.464	18,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP24	Auf der Stroth 23, 21769 Lamstedt	505.712	5.942.421	17,9	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP25	Auf der Stroth 21, 21769 Lamstedt	505.750	5.942.433	18,2	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP26	Auf der Stroth 25, 21769 Lamstedt	505.694	5.942.419	17,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP27	Strother Heuweg 1, 21769 Lamstedt	505.558	5.942.439	17,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP28	Strother Heuweg 9, 21769 Lamstedt	505.461	5.942.466	17,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP29	Birkenweg 11, 21769 Lamstedt	505.801	5.942.160	18,1	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP30	Pappelweg 7, 21769 Lamstedt	505.867	5.942.214	18,7	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP31	Jochensweg 8, 21769 Lamstedt	505.949	5.942.353	19,5	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP32	Driftweg 1, 21769 Lamstedt	504.435	5.942.281	15,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP33	Horn 23, 21769 Armstorf	500.667	5.940.619	5,0	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP34	Sticht 3, 21770 Mittelstenahe	501.302	5.943.517	5,8	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP35	Neues Moor 19, 21770 Mittelstenahe	502.611	5.944.096	11,3	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP36	Haneworth 2, 21770 Lamstedt	503.603	5.943.539	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	504.703	5.943.880	18,6	0,1	0,1	2,0	0,0	"Gewächshaus-Modus"	2,0

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP01	Sticht 1, 21770 Mittelstenahe	8:10	60	0:13	0:51
IP02	Neues Moor 21, 21770 Mittelstenahe	37:42	114	0:31	4:04
IP03	Mittelstenaher Str. 30, 21769 Lamstedt	135:35	87	2:00	13:38
IP04	Wischhofstraße 10, 21769 Lamstedt	67:14	135	0:46	14:02
IP05	Am Kamp 26, 21769 Lamstedt	23:46	75	0:31	5:35
IP06	Strother Heuweg 5, 21769 Lamstedt	24:57	95	0:29	5:39
IP07	Driftweg 2, 21769 Lamstedt	171:14	207	1:48	38:55
IP08	Haneworth 1, 21770 Lamstedt	204:07	181	2:20	23:12
IP09	Sticht 5, 21770 Mittelstenahe	52:47	120	0:50	5:44
IP10	Falkenhorst 1, 21769 Lamstedt	0:00	0	0:00	0:00
IP11	Auf dem Kampen 2, 21769 Lamstedt	81:33	155	0:54	17:35
IP12	Auf dem Kampen 6, 21769 Lamstedt	118:36	202	1:01	26:51
IP13	Auf dem Kampen 5, 21769 Lamstedt	92:54	174	0:54	20:57
IP14	Heinrich-Evers-Straße 4A, 21769 Lamstedt	52:42	126	0:43	11:21
IP15	Heinrich-Evers-Straße 1, 21769 Lamstedt	34:20	85	0:37	7:45
IP16	Kleiner Köven 15A, 21769 Lamstedt	12:20	37	0:29	2:12
IP17	An der Gösche 10, 21769 Lamstedt	23:42	74	0:31	5:23
IP18	Wischhofstraße 17a, 21769 Lamstedt	59:35	146	0:36	13:37
IP19	Wischhofstraße 15, 21769 Lamstedt	49:38	119	0:34	11:36
IP20	Wischhofstraße 13, 21769 Lamstedt	45:48	120	0:32	10:44
IP21	Auf der Stroth 18, 21769 Lamstedt	36:54	101	0:31	8:30
IP22	Auf der Stroth 24, 21769 Lamstedt	34:08	117	0:27	7:39
IP23	Auf der Stroth 20, 21769 Lamstedt	34:38	96	0:32	7:57
IP24	Auf der Stroth 23, 21769 Lamstedt	29:22	92	0:30	6:45
IP25	Auf der Stroth 21, 21769 Lamstedt	33:30	98	0:31	7:42
IP26	Auf der Stroth 25, 21769 Lamstedt	27:42	90	0:28	6:23
IP27	Strother Heuweg 1, 21769 Lamstedt	26:45	104	0:28	6:03

(Fortsetzung nächste Seite)...

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Hauptergebnis

Berechnung: SW24020 Lamstedt Gesamtbelastung

...(Fortsetzung von vorheriger Seite)

Nr.	Name	astron. max. mögl. Beschattungsdauer Stunden/Jahr [h/a]	Schattentage/Jahr [d/a]	Max.Schattendauer/Tag [h/d]	met. wahrsch. Beschattungsdauer Stunden/Jahr [h/a]
IP28	Strother Heuweg 9, 21769 Lamstedt	24:34	81	0:30	5:35
IP29	Birkenweg 11, 21769 Lamstedt	0:00	0	0:00	0:00
IP30	Pappelweg 7, 21769 Lamstedt	5:37	36	0:14	1:15
IP31	Jochensweg 8, 21769 Lamstedt	24:00	70	0:26	5:31
IP32	Driftweg 1, 21769 Lamstedt	236:45	212	1:55	55:16
IP33	Horn 23, 21769 Armstorf	0:00	0	0:00	0:00
IP34	Sticht 3, 21770 Mittelstenahe	12:23	77	0:14	1:25
IP35	Neues Moor 19, 21770 Mittelstenahe	9:32	34	0:21	0:48
IP36	Haneworth 2, 21770 Lamstedt	163:12	170	2:07	18:17
IP37	Mittelstenaher Str. 32, 21769 Lamstedt	119:51	80	1:52	11:55

Gesamtdauer Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal [h/a]	Erwartet [h/a]
WEA01	E-138 EP3 E3	0:00	0:00
WEA02	E-175 EP5	52:52	6:21
WEA03	E-175 EP5	94:33	14:07
WEA04	E-175 EP5	197:04	32:43
WEA05	E-175 EP5	229:01	35:43
WEA06	E-175 EP5	332:56	63:20
WEA07	E-175 EP5	7:47	1:23
WEA08	E-175 EP5	26:05	4:52
WEA09	E-175 EP5	252:03	57:20
WEA10	E-70 E4 (M2)	26:40	3:23
WEA11	E-70 E4 (M3)	19:16	2:54
WEA12	E-70 E4 (M5)	7:38	0:43
WEA13	E-70 E4 (M6)	25:16	2:32
WEA14	E-70 E4 (M8)	0:00	0:00

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP01 - Sticht 1, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42			08:12		08:58 (WEA10)	07:15	07:00	05:51	05:02
	16:14			17:05	13	09:11 (WEA10)	18:00	19:58	20:53	21:43
2	08:41			08:10		08:59 (WEA10)	07:12	06:58	05:49	05:01
	16:15			17:07	13	09:12 (WEA10)	18:02	20:00	20:55	21:44
3	08:41			08:08		09:00 (WEA10)	07:10	06:55	05:47	05:00
	16:16			17:09	11	09:11 (WEA10)	18:04	20:02	20:57	21:45
4	08:41			08:07		09:01 (WEA10)	07:08	06:53	05:45	05:00
	16:18			17:11	9	09:10 (WEA10)	18:06	20:04	20:59	21:46
5	08:41			08:05		09:03 (WEA10)	07:05	06:50	05:43	04:59
	16:19			17:13	6	09:09 (WEA10)	18:08	20:06	21:00	21:47
6	08:40			08:03			07:03	06:48	05:41	04:58
	16:20			17:15			18:10	20:08	21:02	21:48
7	08:40			08:01			07:01	06:45	05:39	04:57
	16:21			17:17			18:12	20:09	21:04	21:49
8	08:39			07:59			06:58	06:43	05:37	04:57
	16:23			17:19			18:14	20:11	21:06	21:50
9	08:39			07:57			06:56	06:41	05:35	04:56
	16:24			17:21			18:16	20:13	21:08	21:51
10	08:38			07:55			06:53	06:38	05:34	04:56
	16:26			17:23			18:18	20:15	21:09	21:52
11	08:37		09:14 (WEA13)	07:53			06:51	06:36	05:32	04:55
	16:27	4	09:18 (WEA13)	17:25			18:19	20:17	21:11	21:53
12	08:37		09:13 (WEA13)	07:51			06:49	06:34	05:30	04:55
	16:29	7	09:20 (WEA13)	17:27			18:21	20:19	21:13	21:54
13	08:36		09:13 (WEA13)	07:49			06:46	06:31	05:28	04:55
	16:30	8	09:21 (WEA13)	17:29			18:23	20:20	21:14	21:54
14	08:35		09:13 (WEA13)	07:47			06:44	06:29	05:27	04:54
	16:32	9	09:22 (WEA13)	17:31			18:25	20:22	21:16	21:55
15	08:34		09:13 (WEA13)	07:45			06:41	06:27	05:25	04:54
	16:34	10	09:23 (WEA13)	17:33			18:27	20:24	21:18	21:56
16	08:33		09:13 (WEA13)	07:43			06:39	06:24	05:23	04:54
	16:35	11	09:24 (WEA13)	17:35			18:29	20:26	21:19	21:56
17	08:32		09:14 (WEA13)	07:41			06:37	06:22	05:22	04:54
	16:37	10	09:24 (WEA13)	17:37			18:31	20:28	21:21	21:57
18	08:31		09:14 (WEA13)	07:39			06:34	06:20	05:20	04:54
	16:39	11	09:25 (WEA13)	17:39			18:33	20:30	21:23	21:57
19	08:30		09:14 (WEA13)	07:37			06:32	06:17	05:18	04:54
	16:41	10	09:24 (WEA13)	17:41			18:34	20:31	21:24	21:58
20	08:29		09:15 (WEA13)	07:35			06:29	06:15	05:17	04:54
	16:42	10	09:25 (WEA13)	17:43			18:36	20:33	21:26	21:58
21	08:28		09:15 (WEA13)	07:33			06:27	06:13	05:15	04:54
	16:44	9	09:24 (WEA13)	17:45			18:38	20:35	21:27	21:58
22	08:26		09:17 (WEA13)	07:30			06:24	06:11	05:14	04:54
	16:46	6	09:23 (WEA13)	17:47			18:40	20:37	21:29	21:58
23	08:25		09:20 (WEA13)	07:28			06:22	06:08	05:13	04:54
	16:48	2	09:22 (WEA13)	17:49			18:42	20:39	21:31	21:58
24	08:24			07:26			06:19	06:06	05:11	04:55
	16:50			17:51			18:44	20:41	21:32	21:59
25	08:22			07:24			06:17	06:04	05:10	04:55
	16:51			17:53			18:45	20:42	21:33	21:59
26	08:21		09:02 (WEA10)	07:21			06:15	06:02	05:09	04:55
	16:53	4	09:06 (WEA10)	17:55			18:47	20:44	21:35	21:59
27	08:20		09:00 (WEA10)	07:19			06:12	06:00	05:08	04:56
	16:55	8	09:08 (WEA10)	17:56			18:49	20:46	21:36	21:59
28	08:18		08:59 (WEA10)	07:17			06:10	05:57	05:06	04:56
	16:57	10	09:09 (WEA10)	17:58			18:51	20:48	21:38	21:58
29	08:17		08:59 (WEA10)				07:07	05:55	05:05	04:57
	16:59	12	09:11 (WEA10)				19:53	20:50	21:39	21:58
30	08:15		08:58 (WEA10)				07:05	05:53	05:04	04:58
	17:01	13	09:11 (WEA10)				19:55	20:51	21:40	21:58
31	08:13		08:58 (WEA10)				07:02		05:03	
	17:03	13	09:11 (WEA10)				19:57		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		167			52					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,59			0,60					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		16			7					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP01 - Sticht 1, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November			Dezember		
1	04:58		05:38		06:32		07:24		07:22			08:17		08:56 (WEA13)
	21:58		21:23		20:17		19:03		16:53			16:09	5	09:01 (WEA13)
2	04:59		05:39		06:33		07:26		07:24			08:18		
	21:57		21:21		20:14		19:01		16:51			16:08		
3	05:00		05:41		06:35		07:28		07:26			08:20		
	21:57		21:19		20:12		18:58		16:49			16:08		
4	05:01		05:43		06:37		07:30		07:28			08:21		
	21:56		21:17		20:09		18:56		16:47			16:07		
5	05:01		05:44		06:39		07:32		07:30			08:23		
	21:56		21:15		20:07		18:54		16:45			16:07		
6	05:02		05:46		06:40		07:33		07:32		08:32 (WEA10)	08:24		
	21:55		21:13		20:05		18:51		16:44	7	08:39 (WEA10)	16:06		
7	05:03		05:48		06:42		07:35		07:34		08:31 (WEA10)	08:25		
	21:55		21:12		20:02		18:49		16:42	9	08:40 (WEA10)	16:06		
8	05:04		05:50		06:44		07:37		07:36		08:30 (WEA10)	08:27		
	21:54		21:10		20:00		18:46		16:40	11	08:41 (WEA10)	16:05		
9	05:05		05:51		06:46		07:39		07:38		08:29 (WEA10)	08:28		
	21:53		21:08		19:57		18:44		16:38	13	08:42 (WEA10)	16:05		
10	05:06		05:53		06:47		07:41		07:40		08:29 (WEA10)	08:29		
	21:52		21:06		19:55		18:42		16:36	13	08:42 (WEA10)	16:04		
11	05:08		05:55		06:49		07:43		07:41		08:30 (WEA10)	08:30		
	21:51		21:04		19:52		18:39		16:35	13	08:43 (WEA10)	16:04		
12	05:09		05:56		06:51		07:44		07:43		08:30 (WEA10)	08:31		
	21:50		21:01		19:50		18:37		16:33	13	08:43 (WEA10)	16:04		
13	05:10		05:58		06:53		07:46		07:45		08:31 (WEA10)	08:32		
	21:50		20:59		19:48		18:35		16:31	11	08:42 (WEA10)	16:04		
14	05:11		06:00		06:54		07:48		07:47		08:32 (WEA10)	08:33		
	21:48		20:57		19:45		18:32		16:30	10	08:42 (WEA10)	16:04		
15	05:12		06:02		06:56		07:50		07:49		08:33 (WEA10)	08:34		
	21:47		20:55		19:43		18:30		16:28	8	08:41 (WEA10)	16:04		
16	05:14		06:03		06:58		07:52		07:51		08:35 (WEA10)	08:35		09:53 (WEA12)
	21:46		20:53		19:40		18:28		16:27	4	08:39 (WEA10)	16:04	1	09:54 (WEA12)
17	05:15		06:05		07:00		07:54		07:53			08:36		09:52 (WEA12)
	21:45		20:51		19:38		18:25		16:25			16:04	4	09:56 (WEA12)
18	05:16		06:07		07:01		07:56		07:55			08:37		09:52 (WEA12)
	21:44		20:49		19:35		18:23		16:24			16:04	4	09:56 (WEA12)
19	05:18		06:09		07:03		07:57		07:56		08:54 (WEA13)	08:38		09:52 (WEA12)
	21:43		20:47		19:33		18:21		16:22	2	08:56 (WEA13)	16:05	5	09:57 (WEA12)
20	05:19		06:10		07:05		07:59		07:58		08:52 (WEA13)	08:38		09:53 (WEA12)
	21:41		20:44		19:30		18:19		16:21	6	08:58 (WEA13)	16:05	5	09:58 (WEA12)
21	05:21		06:12		07:07		08:01		08:00		08:51 (WEA13)	08:39		09:53 (WEA12)
	21:40		20:42		19:28		18:16		16:20	9	09:00 (WEA13)	16:05	5	09:58 (WEA12)
22	05:22		06:14		07:08		08:03		08:02		08:51 (WEA13)	08:39		09:54 (WEA12)
	21:39		20:40		19:25		18:14		16:18	10	09:01 (WEA13)	16:06	5	09:59 (WEA12)
23	05:24		06:16		07:10		08:05		08:04		08:51 (WEA13)	08:40		09:54 (WEA12)
	21:37		20:38		19:23		18:12		16:17	10	09:01 (WEA13)	16:06	5	09:59 (WEA12)
24	05:25		06:18		07:12		08:07		08:05		08:51 (WEA13)	08:40		09:54 (WEA12)
	21:36		20:35		19:20		18:10		16:16	11	09:02 (WEA13)	16:07	5	09:59 (WEA12)
25	05:27		06:19		07:14		07:09		08:07		08:52 (WEA13)	08:41		09:55 (WEA12)
	21:34		20:33		19:18		17:08		16:15	10	09:02 (WEA13)	16:08	5	10:00 (WEA12)
26	05:28		06:21		07:16		07:11		08:09		08:51 (WEA13)	08:41		09:56 (WEA12)
	21:33		20:31		19:16		17:05		16:14	11	09:02 (WEA13)	16:08	4	10:00 (WEA12)
27	05:30		06:23		07:17		07:13		08:10		08:52 (WEA13)	08:41		09:57 (WEA12)
	21:31		20:28		19:13		17:03		16:13	10	09:02 (WEA13)	16:09	3	10:00 (WEA12)
28	05:31		06:25		07:19		07:15		08:12		08:53 (WEA13)	08:41		
	21:30		20:26		19:11		17:01		16:12	9	09:02 (WEA13)	16:10		
29	05:33		06:26		07:21		07:16		08:14		08:54 (WEA13)	08:42		
	21:28		20:24		19:08		16:59		16:11	8	09:02 (WEA13)	16:11		
30	05:34		06:28		07:23		07:18		08:15		08:55 (WEA13)	08:42		
	21:26		20:21		19:06		16:57		16:10	7	09:02 (WEA13)	16:12		
31	05:36		06:30				07:20					08:42		
	21:24		20:19				16:55					16:13		
Sonnenscheinstunden	511		459		382		329		260			234		
astr.max.mögl.Beschattung									215				56	
Red.Sonnenscheinwahrsch.									0,19				0,14	
Reduktion Betriebsdauer									0,95				0,95	
Reduktion Windrichtung									0,59				0,61	
Gesamte Reduktion									0,11				0,08	
Met.wahrsch.Beschattung									24				5	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP02 - Neues Moor 21, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42		09:15 (WEA04)	08:12			07:15	07:00	05:51	05:02
	16:14	15	09:30 (WEA04)	17:05			18:00	19:58	20:53	21:43
2	08:41		09:15 (WEA04)	08:10			07:12	06:57	05:49	05:01
	16:15	16	09:31 (WEA04)	17:07			18:02	20:00	20:55	21:44
3	08:41		09:15 (WEA04)	08:08			07:10	06:55	05:47	05:00
	16:16	18	09:33 (WEA04)	17:09			18:04	20:02	20:57	21:45
4	08:41		09:14 (WEA04)	08:06			07:08	06:53	05:45	04:59
	16:17	19	09:33 (WEA04)	17:11			18:06	20:04	20:59	21:46
5	08:41		09:14 (WEA04)	08:05			07:05	06:50	05:43	04:59
	16:19	20	09:34 (WEA04)	17:13			18:08	20:06	21:00	21:47
6	08:40		09:13 (WEA04)	08:03			07:03	06:48	05:41	04:58
	16:20	21	09:34 (WEA04)	17:15			18:10	20:07	21:02	21:48
7	08:40		09:12 (WEA04)	08:01		08:28 (WEA05)	07:01	06:45	05:39	04:57
	16:21	23	09:35 (WEA04)	17:17	1	08:29 (WEA05)	18:12	20:09	21:04	21:49
8	08:39		09:12 (WEA04)	07:59		08:26 (WEA05)	06:58	06:43	05:37	04:57
	16:23	24	09:36 (WEA04)	17:19	5	08:31 (WEA05)	18:14	20:11	21:06	21:50
9	08:39		09:11 (WEA04)	07:57		08:24 (WEA05)	06:56	06:41	05:35	04:56
	16:24	25	09:36 (WEA04)	17:21	8	08:32 (WEA05)	18:16	20:13	21:07	21:51
10	08:38		09:10 (WEA04)	07:55		08:22 (WEA05)	06:53	06:38	05:34	04:56
	16:26	27	09:37 (WEA04)	17:23	11	08:33 (WEA05)	18:17	20:15	21:09	21:52
11	08:37		09:09 (WEA04)	07:53		08:20 (WEA05)	06:51	06:36	05:32	04:55
	16:27	28	09:37 (WEA04)	17:25	14	08:34 (WEA05)	18:19	20:17	21:11	21:53
12	08:37		09:08 (WEA04)	07:51		08:17 (WEA05)	06:49	06:34	05:30	04:55
	16:29	30	09:38 (WEA04)	17:27	17	08:34 (WEA05)	18:21	20:18	21:13	21:54
13	08:36		09:09 (WEA04)	07:49		08:15 (WEA05)	06:46	06:31	05:28	04:54
	16:30	29	09:38 (WEA04)	17:29	19	08:34 (WEA05)	18:23	20:20	21:14	21:54
14	08:35		09:09 (WEA04)	07:47		08:13 (WEA05)	06:44	06:29	05:26	04:54
	16:32	30	09:39 (WEA04)	17:31	22	08:35 (WEA05)	18:25	20:22	21:16	21:55
15	08:34		09:09 (WEA04)	07:45		08:11 (WEA05)	06:41	06:26	05:25	04:54
	16:34	30	09:39 (WEA04)	17:33	24	08:35 (WEA05)	18:27	20:24	21:18	21:56
16	08:33		09:10 (WEA04)	07:43		08:11 (WEA05)	06:39	06:24	05:23	04:54
	16:35	30	09:40 (WEA04)	17:35	24	08:35 (WEA05)	18:29	20:26	21:19	21:56
17	08:32		09:10 (WEA04)	07:41		08:12 (WEA05)	06:36	06:22	05:22	04:54
	16:37	30	09:40 (WEA04)	17:37	22	08:34 (WEA05)	18:31	20:28	21:21	21:57
18	08:31		09:10 (WEA04)	07:39		08:12 (WEA05)	06:34	06:20	05:20	04:54
	16:39	30	09:40 (WEA04)	17:39	21	08:33 (WEA05)	18:32	20:29	21:23	21:57
19	08:30		09:11 (WEA04)	07:37		08:13 (WEA05)	06:32	06:17	05:18	04:54
	16:40	29	09:40 (WEA04)	17:41	19	08:32 (WEA05)	18:34	20:31	21:24	21:57
20	08:29		09:12 (WEA04)	07:35		08:14 (WEA05)	06:29	06:15	05:17	04:54
	16:42	29	09:41 (WEA04)	17:43	17	08:31 (WEA05)	18:36	20:33	21:26	21:58
21	08:28		09:12 (WEA04)	07:33		08:16 (WEA05)	06:27	06:13	05:15	04:54
	16:44	28	09:40 (WEA04)	17:45	14	08:30 (WEA05)	18:38	20:35	21:27	21:58
22	08:26		09:13 (WEA04)	07:30		08:18 (WEA05)	06:24	06:11	05:14	04:54
	16:46	28	09:41 (WEA04)	17:47	8	08:26 (WEA05)	18:40	20:37	21:29	21:58
23	08:25		09:13 (WEA04)	07:28			06:22	06:08	05:13	04:54
	16:48	27	09:40 (WEA04)	17:49			18:42	20:39	21:30	21:58
24	08:24		09:14 (WEA04)	07:26			06:19	06:06	05:11	04:55
	16:50	26	09:40 (WEA04)	17:51			18:44	20:40	21:32	21:58
25	08:22		09:15 (WEA04)	07:24			06:17	06:04	05:10	04:55
	16:51	25	09:40 (WEA04)	17:52			18:45	20:42	21:33	21:59
26	08:21		09:16 (WEA04)	07:21			06:15	06:02	05:09	04:55
	16:53	24	09:40 (WEA04)	17:54			18:47	20:44	21:35	21:59
27	08:19		09:17 (WEA04)	07:19			06:12	06:00	05:07	04:56
	16:55	22	09:39 (WEA04)	17:56			18:49	20:46	21:36	21:58
28	08:18		09:18 (WEA04)	07:17			06:10	05:57	05:06	04:56
	16:57	19	09:37 (WEA04)	17:58			18:51	20:48	21:38	21:58
29	08:16		09:21 (WEA04)				07:07	05:55	05:05	04:57
	16:59	16	09:37 (WEA04)				19:53	20:50	21:39	21:58
30	08:15		09:23 (WEA04)				07:05	05:53	05:04	04:58
	17:01	11	09:34 (WEA04)				19:55	20:51	21:40	21:58
31	08:13		09:28 (WEA04)				07:02		05:03	
	17:03	1	09:29 (WEA04)				19:56		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		730			246					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,59			0,62					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		70			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 Zeitpunkt (SS:MM) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP02 - Neues Moor 21, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober			November			Dezember		
1	04:58		05:38		06:32		07:24			07:22		07:51 (WEA05)	08:17		08:51 (WEA04)
	21:58		21:23		20:17		19:03			16:53	11	08:02 (WEA05)	16:09	28	09:19 (WEA04)
2	04:59		05:39		06:33		07:26			07:24		07:54 (WEA05)	08:18		08:53 (WEA04)
	21:57		21:21		20:14		19:01			16:51	8	08:02 (WEA05)	16:08	27	09:20 (WEA04)
3	05:00		05:41		06:35		07:28			07:26		07:56 (WEA05)	08:20		08:54 (WEA04)
	21:57		21:19		20:12		18:58			16:49	5	08:01 (WEA05)	16:08	25	09:19 (WEA04)
4	05:00		05:43		06:37		07:30			07:28		07:58 (WEA05)	08:21		08:56 (WEA04)
	21:56		21:17		20:09		18:56			16:47	1	07:59 (WEA05)	16:07	24	09:20 (WEA04)
5	05:01		05:44		06:39		07:32			07:30			08:23		08:58 (WEA04)
	21:56		21:15		20:07		18:54			16:45			16:06	23	09:21 (WEA04)
6	05:02		05:46		06:40		07:33			07:32			08:24		08:59 (WEA04)
	21:55		21:13		20:05		18:51			16:43			16:06	21	09:20 (WEA04)
7	05:03		05:48		06:42		07:35			07:34			08:25		09:00 (WEA04)
	21:54		21:11		20:02		18:49			16:42			16:05	20	09:20 (WEA04)
8	05:04		05:49		06:44		07:37			07:36			08:27		09:02 (WEA04)
	21:54		21:10		20:00		18:46			16:40			16:05	19	09:21 (WEA04)
9	05:05		05:51		06:46		07:39			07:38			08:28		09:03 (WEA04)
	21:53		21:08		19:57		18:44			16:38			16:05	18	09:21 (WEA04)
10	05:06		05:53		06:47		07:41			07:39			08:29		09:04 (WEA04)
	21:52		21:06		19:55		18:42			16:36			16:04	17	09:21 (WEA04)
11	05:07		05:55		06:49		07:42			07:41		08:58 (WEA04)	08:30		09:06 (WEA04)
	21:51		21:03		19:52		18:39			16:35	3	09:01 (WEA04)	16:04	16	09:22 (WEA04)
12	05:09		05:56		06:51		07:44			07:43		08:54 (WEA04)	08:31		09:07 (WEA04)
	21:50		21:01		19:50		18:37			16:33	12	09:06 (WEA04)	16:04	15	09:22 (WEA04)
13	05:10		05:58		06:53		07:46			07:45		08:52 (WEA04)	08:32		09:08 (WEA04)
	21:49		20:59		19:47		18:35			16:31	17	09:09 (WEA04)	16:04	14	09:22 (WEA04)
14	05:11		06:00		06:54		07:48			07:47		08:51 (WEA04)	08:33		09:09 (WEA04)
	21:48		20:57		19:45		18:32			16:30	19	09:10 (WEA04)	16:04	13	09:22 (WEA04)
15	05:12		06:02		06:56		07:50			07:49		08:50 (WEA04)	08:34		09:10 (WEA04)
	21:47		20:55		19:43		18:30			16:28	22	09:12 (WEA04)	16:04	12	09:22 (WEA04)
16	05:14		06:03		06:58		07:52			07:51		08:49 (WEA04)	08:35		09:11 (WEA04)
	21:46		20:53		19:40		18:28			16:27	24	09:13 (WEA04)	16:04	12	09:23 (WEA04)
17	05:15		06:05		07:00		07:54			07:53		08:49 (WEA04)	08:36		09:11 (WEA04)
	21:45		20:51		19:38		18:25			16:25	25	09:14 (WEA04)	16:04	14	10:36 (WEA03)
18	05:16		06:07		07:01		07:55			07:55		08:48 (WEA04)	08:37		09:12 (WEA04)
	21:44		20:49		19:35		18:23			16:24	26	09:14 (WEA04)	16:04	16	10:38 (WEA03)
19	05:18		06:09		07:03		07:57			07:56		08:48 (WEA04)	08:38		09:13 (WEA04)
	21:43		20:46		19:33		18:21			16:22	27	09:15 (WEA04)	16:05	17	10:40 (WEA03)
20	05:19		06:10		07:05		07:59		08:48 (WEA05)	07:58		08:48 (WEA04)	08:38		09:14 (WEA04)
	21:41		20:44		19:30		18:19	11	08:59 (WEA05)	16:21	28	09:16 (WEA04)	16:05	18	10:41 (WEA03)
21	05:20		06:12		07:07		08:01		08:46 (WEA05)	08:00		08:48 (WEA04)	08:39		09:14 (WEA04)
	21:40		20:42		19:28		18:16	15	09:01 (WEA05)	16:20	28	09:16 (WEA04)	16:05	18	10:41 (WEA03)
22	05:22		06:14		07:08		08:03		08:44 (WEA05)	08:02		08:48 (WEA04)	08:39		09:15 (WEA04)
	21:39		20:40		19:25		18:14	18	09:02 (WEA05)	16:18	29	09:17 (WEA04)	16:06	18	10:42 (WEA03)
23	05:23		06:16		07:10		08:05		08:43 (WEA05)	08:04		08:48 (WEA04)	08:40		09:15 (WEA04)
	21:37		20:37		19:23		18:12	20	09:03 (WEA05)	16:17	30	09:18 (WEA04)	16:06	18	10:42 (WEA03)
24	05:25		06:17		07:12		08:07		08:42 (WEA05)	08:05		08:48 (WEA04)	08:40		09:15 (WEA04)
	21:36		20:35		19:20		18:10	22	09:04 (WEA05)	16:16	30	09:18 (WEA04)	16:07	18	10:42 (WEA03)
25	05:26		06:19		07:14		07:09		07:41 (WEA05)	08:07		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:34		20:33		19:18		17:08	23	08:04 (WEA05)	16:15	31	09:19 (WEA04)	16:08	16	10:42 (WEA03)
26	05:28		06:21		07:15		07:11		07:41 (WEA05)	08:09		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:33		20:31		19:15		17:05	23	08:04 (WEA05)	16:14	30	09:18 (WEA04)	16:08	16	10:42 (WEA03)
27	05:30		06:23		07:17		07:13		07:41 (WEA05)	08:10		08:48 (WEA04)	08:41		09:16 (WEA04)
	21:31		20:28		19:13		17:03	23	08:04 (WEA05)	16:13	30	09:18 (WEA04)	16:09	11	09:27 (WEA04)
28	05:31		06:24		07:19		07:14		07:43 (WEA05)	08:12		08:49 (WEA04)	08:41		09:16 (WEA04)
	21:29		20:26		19:11		17:01	21	08:04 (WEA05)	16:12	30	09:19 (WEA04)	16:10	12	09:28 (WEA04)
29	05:33		06:26		07:21		07:16		07:45 (WEA05)	08:14		08:50 (WEA04)	08:42		09:16 (WEA04)
	21:28		20:24		19:08		16:59	19	08:04 (WEA05)	16:11	29	09:19 (WEA04)	16:11	13	09:29 (WEA04)
30	05:34		06:28		07:23		07:18		07:47 (WEA05)	08:15		08:50 (WEA04)	08:42		09:16 (WEA04)
	21:26		20:21		19:06		16:57	16	08:03 (WEA05)	16:10	30	09:20 (WEA04)	16:12	13	09:29 (WEA04)
31	05:36		06:30				07:20		07:49 (WEA05)				08:42		09:16 (WEA04)
	21:24		20:19				16:55	14	08:03 (WEA05)				16:13	14	09:30 (WEA04)
Sonnenscheinstunden	511		459		382		329			260			234		
astr.max.mögl.Beschattung							225				525			536	
Red.Sonnenscheinwahrsch.							0,29				0,19			0,14	
Reduktion Betriebsdauer							0,95				0,95			0,95	
Reduktion Windrichtung							0,62				0,59			0,59	
Gesamte Reduktion							0,17				0,11			0,08	
Met.wahrsch.Beschattung							39				58			43	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP03 - Mittelstenaher Str. 30, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai	Juni
1	08:41		12:46 (WEA06)	08:11	13:18 (WEA06)	07:14	07:00	05:51	05:02
	16:14	115	15:36 (WEA04)	17:05	26 13:44 (WEA06)	18:00	19:58	20:53	21:43
2	08:41		12:47 (WEA06)	08:10	13:21 (WEA06)	07:12	06:57	05:49	05:01
	16:15	116	15:38 (WEA04)	17:07	19 13:40 (WEA06)	18:02	20:00	20:55	21:44
3	08:41		12:48 (WEA06)	08:08		07:10	06:55	05:47	05:00
	16:16	116	15:39 (WEA04)	17:09		18:04	20:02	20:57	21:45
4	08:41		12:48 (WEA06)	08:06		07:07	06:53	05:45	04:59
	16:17	116	15:40 (WEA04)	17:11		18:06	20:04	20:58	21:46
5	08:40		12:49 (WEA06)	08:05		07:05	06:50	05:43	04:59
	16:19	117	15:42 (WEA04)	17:13		18:08	20:06	21:00	21:47
6	08:40		12:49 (WEA06)	08:03		07:03	06:48	05:41	04:58
	16:20	118	15:43 (WEA04)	17:15		18:10	20:07	21:02	21:48
7	08:40		12:49 (WEA06)	08:01		07:00	06:45	05:39	04:57
	16:21	118	15:44 (WEA04)	17:17		18:12	20:09	21:04	21:49
8	08:39		12:51 (WEA06)	07:59		06:58	06:43	05:37	04:57
	16:23	118	15:47 (WEA04)	17:19		18:14	20:11	21:06	21:50
9	08:39		12:51 (WEA06)	07:57		06:56	06:41	05:35	04:56
	16:24	118	15:48 (WEA04)	17:21		18:15	20:13	21:07	21:51
10	08:38		12:51 (WEA06)	07:55		06:53	06:38	05:33	04:55
	16:26	119	15:49 (WEA04)	17:23		18:17	20:15	21:09	21:52
11	08:37		12:52 (WEA06)	07:53		06:51	06:36	05:32	04:55
	16:27	119	15:51 (WEA04)	17:25		18:19	20:17	21:11	21:53
12	08:37		12:52 (WEA06)	07:51		06:48	06:33	05:30	04:55
	16:29	120	15:53 (WEA04)	17:27		18:21	20:18	21:13	21:54
13	08:36		12:53 (WEA06)	07:49		06:46	06:31	05:28	04:54
	16:30	118	15:54 (WEA04)	17:29		18:23	20:20	21:14	21:54
14	08:35		12:54 (WEA06)	07:47		06:44	06:29	05:26	04:54
	16:32	117	15:55 (WEA04)	17:31		18:25	20:22	21:16	21:55
15	08:34		12:55 (WEA06)	07:45		06:41	06:26	05:25	04:54
	16:33	112	15:55 (WEA04)	17:33		18:27	20:24	21:18	21:55
16	08:33		12:55 (WEA06)	07:43		06:39	06:24	05:23	04:54
	16:35	111	15:56 (WEA04)	17:35		18:29	20:26	21:19	21:56
17	08:32		12:56 (WEA06)	07:41		06:36	06:22	05:21	04:54
	16:37	107	15:56 (WEA04)	17:37		18:30	20:28	21:21	21:57
18	08:31		12:57 (WEA06)	07:39		06:34	06:19	05:20	04:54
	16:39	100	15:55 (WEA04)	17:39		18:32	20:29	21:23	21:57
19	08:30		12:58 (WEA06)	07:37		06:31	06:17	05:18	04:54
	16:40	95	15:56 (WEA04)	17:41		18:34	20:31	21:24	21:57
20	08:29		12:59 (WEA06)	07:35		06:29	06:15	05:17	04:54
	16:42	82	15:56 (WEA04)	17:43		18:36	20:33	21:26	21:58
21	08:28		12:59 (WEA06)	07:32		06:27	06:13	05:15	04:54
	16:44	80	15:55 (WEA04)	17:45		18:38	20:35	21:27	21:58
22	08:26		13:01 (WEA06)	07:30		06:24	06:10	05:14	04:54
	16:46	78	15:56 (WEA04)	17:46		18:40	20:37	21:29	21:58
23	08:25		13:01 (WEA06)	07:28		06:22	06:08	05:12	04:54
	16:48	75	15:55 (WEA04)	17:48		18:42	20:39	21:30	21:58
24	08:24		13:03 (WEA06)	07:26		06:19	06:06	05:11	04:54
	16:49	70	15:54 (WEA04)	17:50		18:43	20:40	21:32	21:58
25	08:22		13:04 (WEA06)	07:24		06:17	06:04	05:10	04:55
	16:51	66	15:53 (WEA04)	17:52		18:45	20:42	21:33	21:58
26	08:21		13:06 (WEA06)	07:21		06:14	06:02	05:09	04:55
	16:53	61	15:52 (WEA04)	17:54		18:47	20:44	21:35	21:58
27	08:19		13:07 (WEA06)	07:19		06:12	05:59	05:07	04:56
	16:55	54	15:50 (WEA04)	17:56		18:49	20:46	21:36	21:58
28	08:18		13:08 (WEA06)	07:17		06:10	05:57	05:06	04:56
	16:57	43	13:51 (WEA06)	17:58		18:51	20:48	21:38	21:58
29	08:16		13:11 (WEA06)			07:07	05:55	05:05	04:57
	16:59	39	13:50 (WEA06)			19:53	20:49	21:39	21:58
30	08:15		13:13 (WEA06)			07:05	05:53	05:04	04:57
	17:01	36	13:49 (WEA06)			19:54	20:51	21:40	21:58
31	08:13		13:15 (WEA06)			07:02		05:03	
	17:03	31	13:46 (WEA06)			19:56		21:41	
Sonnenscheinstunden	251			274		367	420	493	509
astr.max.mögl.Beschattung		2885		45					
Red.Sonnenscheinwahrsch.		0,17		0,24					
Reduktion Betriebsdauer		0,95		0,95					
Reduktion Windrichtung		0,65		0,64					
Gesamte Reduktion		0,11		0,14					
Met.wahrsch.Beschattung		305		7					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP03 - Mittelstenaher Str. 30, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November			Dezember			
1	04:58		05:38		06:31		07:24		07:22				08:17		12:34 (WEA06)
	21:57		21:23		20:16		19:03		16:53				16:09	119	15:33 (WEA04)
2	04:59		05:39		06:33		07:26		07:24				08:18		12:34 (WEA06)
	21:57		21:21		20:14		19:01		16:51				16:08	119	15:33 (WEA04)
3	05:00		05:41		06:35		07:28		07:26				08:20		12:34 (WEA06)
	21:57		21:19		20:12		18:58		16:49				16:08	118	15:31 (WEA04)
4	05:00		05:43		06:37		07:30		07:28				08:21		12:35 (WEA06)
	21:56		21:17		20:09		18:56		16:47				16:07	118	15:31 (WEA04)
5	05:01		05:44		06:38		07:31		07:30				08:22		12:34 (WEA06)
	21:56		21:15		20:07		18:53		16:45				16:06	119	15:30 (WEA04)
6	05:02		05:46		06:40		07:33		07:32				08:24		12:35 (WEA06)
	21:55		21:13		20:04		18:51		16:43				16:06	118	15:29 (WEA04)
7	05:03		05:48		06:42		07:35		07:34				08:25		12:35 (WEA06)
	21:54		21:11		20:02		18:49		16:42				16:05	117	15:28 (WEA04)
8	05:04		05:49		06:44		07:37		07:36			12:59 (WEA06)	08:26		12:36 (WEA06)
	21:54		21:09		20:00		18:46		16:40	6		13:05 (WEA06)	16:05	117	15:28 (WEA04)
9	05:05		05:51		06:45		07:39		07:37			12:52 (WEA06)	08:28		12:36 (WEA06)
	21:53		21:07		19:57		18:44		16:38	19		13:11 (WEA06)	16:05	117	15:28 (WEA04)
10	05:06		05:53		06:47		07:41		07:39			12:48 (WEA06)	08:29		12:36 (WEA06)
	21:52		21:05		19:55		18:41		16:36	27		13:15 (WEA06)	16:04	116	15:27 (WEA04)
11	05:07		05:55		06:49		07:42		07:41			12:45 (WEA06)	08:30		12:36 (WEA06)
	21:51		21:03		19:52		18:39		16:34	32		13:17 (WEA06)	16:04	116	15:26 (WEA04)
12	05:08		05:56		06:51		07:44		07:43			12:43 (WEA06)	08:31		12:38 (WEA06)
	21:50		21:01		19:50		18:37		16:33	37		13:20 (WEA06)	16:04	115	15:27 (WEA04)
13	05:10		05:58		06:52		07:46		07:45			12:43 (WEA06)	08:32		12:38 (WEA06)
	21:49		20:59		19:47		18:34		16:31	39		13:22 (WEA06)	16:04	114	15:27 (WEA04)
14	05:11		06:00		06:54		07:48		07:47			12:41 (WEA06)	08:33		12:38 (WEA06)
	21:48		20:57		19:45		18:32		16:30	43		13:24 (WEA06)	16:04	114	15:27 (WEA04)
15	05:12		06:02		06:56		07:50		07:49			12:40 (WEA06)	08:34		12:39 (WEA06)
	21:47		20:55		19:42		18:30		16:28	54		15:23 (WEA04)	16:04	114	15:27 (WEA04)
16	05:13		06:03		06:58		07:52		07:51			12:39 (WEA06)	08:35		12:39 (WEA06)
	21:46		20:53		19:40		18:27		16:26	61		15:25 (WEA04)	16:04	114	15:27 (WEA04)
17	05:15		06:05		06:59		07:53		07:53			12:38 (WEA06)	08:36		12:39 (WEA06)
	21:45		20:51		19:37		18:25		16:25	67		15:27 (WEA04)	16:04	113	15:26 (WEA04)
18	05:16		06:07		07:01		07:55		07:54			12:37 (WEA06)	08:37		12:40 (WEA06)
	21:44		20:49		19:35		18:23		16:24	71		15:28 (WEA04)	16:04	112	15:26 (WEA04)
19	05:18		06:09		07:03		07:57		07:56			12:36 (WEA06)	08:37		12:40 (WEA06)
	21:42		20:46		19:33		18:21		16:22	75		15:30 (WEA04)	16:04	113	15:27 (WEA04)
20	05:19		06:10		07:05		07:59		07:58			12:36 (WEA06)	08:38		12:40 (WEA06)
	21:41		20:44		19:30		18:18		16:21	78		15:31 (WEA04)	16:05	113	15:27 (WEA04)
21	05:20		06:12		07:06		08:01		08:00			12:35 (WEA06)	08:39		12:41 (WEA06)
	21:40		20:42		19:28		18:16		16:19	80		15:31 (WEA04)	16:05	111	15:27 (WEA04)
22	05:22		06:14		07:08		08:03		08:02			12:35 (WEA06)	08:39		12:41 (WEA06)
	21:38		20:40		19:25		18:14		16:18	82		15:32 (WEA04)	16:06	111	15:27 (WEA04)
23	05:23		06:16		07:10		08:05		08:03			12:35 (WEA06)	08:40		12:42 (WEA06)
	21:37		20:37		19:23		18:12		16:17	95		15:33 (WEA04)	16:06	113	15:29 (WEA04)
24	05:25		06:17		07:12		08:07		08:05			12:35 (WEA06)	08:40		12:42 (WEA06)
	21:36		20:35		19:20		18:10		16:16	101		15:34 (WEA04)	16:07	113	15:29 (WEA04)
25	05:26		06:19		07:14		07:09		08:07			12:34 (WEA06)	08:41		12:43 (WEA06)
	21:34		20:33		19:18		17:07		16:15	105		15:33 (WEA04)	16:07	111	15:29 (WEA04)
26	05:28		06:21		07:15		07:11		08:09			12:34 (WEA06)	08:41		12:44 (WEA06)
	21:33		20:30		19:15		17:05		16:14	110		15:34 (WEA04)	16:08	113	15:31 (WEA04)
27	05:29		06:23		07:17		07:12		08:10			12:34 (WEA06)	08:41		12:44 (WEA06)
	21:31		20:28		19:13		17:03		16:13	112		15:34 (WEA04)	16:09	113	15:31 (WEA04)
28	05:31		06:24		07:19		07:14		08:12			12:34 (WEA06)	08:41		12:45 (WEA06)
	21:29		20:26		19:10		17:01		16:12	116		15:35 (WEA04)	16:10	112	15:32 (WEA04)
29	05:33		06:26		07:21		07:16		08:13			12:34 (WEA06)	08:41		12:45 (WEA06)
	21:28		20:23		19:08		16:59		16:11	119		15:36 (WEA04)	16:11	114	15:33 (WEA04)
30	05:34		06:28		07:22		07:18		08:15			12:34 (WEA06)	08:41		12:46 (WEA06)
	21:26		20:21		19:06		16:57		16:10	120		15:34 (WEA04)	16:12	114	15:34 (WEA04)
31	05:36		06:30				07:20						08:41		12:46 (WEA06)
	21:24		20:19				16:55						16:13	115	15:36 (WEA04)
Sonnenscheinstunden	511		459		382		329		260				234		
astr.max.mögl.Beschattung										1649				3556	
Red.Sonnenscheinwahrsch.										0,19				0,14	
Reduktion Betriebsdauer										0,95				0,95	
Reduktion Windrichtung										0,65				0,65	
Gesamte Reduktion										0,12				0,09	
Met.wahrsch.Beschattung										198				310	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP04 - Wischhofstraße 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar		März		April		Mai	Juni
1	08:41	08:11		07:14		16:49 (WEA09)	07:00	18:53 (WEA05)	05:51	05:02
	16:14	17:05		18:00	34	17:23 (WEA09)	19:58	38	19:31 (WEA05)	20:53	21:43
2	08:41	08:10		07:12		16:49 (WEA09)	06:57		18:52 (WEA05)	05:49	05:01
	16:15	17:07		18:02	32	17:21 (WEA09)	20:00	41	19:33 (WEA05)	20:55	21:44
3	08:41	08:08		07:10		16:50 (WEA09)	06:55		18:51 (WEA05)	05:47	05:00
	16:16	17:09		18:04	31	17:21 (WEA09)	20:02	42	19:33 (WEA05)	20:57	21:45
4	08:41	08:06		07:07		16:51 (WEA09)	06:52		18:50 (WEA05)	05:45	04:59
	16:17	17:11		18:06	29	17:20 (WEA09)	20:04	44	19:34 (WEA05)	20:58	21:46
5	08:40	08:04		07:05		16:51 (WEA09)	06:50		18:50 (WEA05)	05:43	04:59
	16:19	17:13		18:08	28	17:19 (WEA09)	20:05	44	19:34 (WEA05)	21:00	21:47
6	08:40	08:03		07:03		16:52 (WEA09)	06:48		18:48 (WEA05)	05:41	04:58
	16:20	17:15		18:10	26	17:18 (WEA09)	20:07	46	19:34 (WEA05)	21:02	21:48
7	08:40	08:01		07:00		16:53 (WEA09)	06:45		18:48 (WEA05)	05:39	04:57
	16:21	17:17		18:12	22	17:15 (WEA09)	20:09	46	19:34 (WEA05)	21:04	21:49
8	08:39	07:59		06:58		16:56 (WEA09)	06:43		18:48 (WEA05)	05:37	04:57
	16:23	17:19		18:14	17	17:13 (WEA09)	20:11	46	19:34 (WEA05)	21:06	21:50
9	08:38	07:57		06:56		17:00 (WEA09)	06:40		18:47 (WEA05)	05:35	04:56
	16:24	17:21		18:15	10	17:10 (WEA09)	20:13	46	19:33 (WEA05)	21:07	21:51
10	08:38	07:55		06:53			06:38		18:47 (WEA05)	05:33	04:56
	16:26	17:23		18:17			20:15	46	19:33 (WEA05)	21:09	21:52
11	08:37	07:53		06:51			06:36		18:47 (WEA05)	05:32	04:55
	16:27	17:25		18:19			20:16	46	19:33 (WEA05)	21:11	21:53
12	08:36	07:51		06:48		17:52 (WEA04)	06:33		18:47 (WEA05)	05:30	04:55
	16:29	17:27		18:21	2	17:54 (WEA04)	20:18	45	19:32 (WEA05)	21:12	21:53
13	08:36	07:49		06:46		17:49 (WEA04)	06:31		18:47 (WEA05)	05:28	04:54
	16:30	17:29		18:23	8	17:57 (WEA04)	20:20	45	19:32 (WEA05)	21:14	21:54
14	08:35	07:47		06:44		17:47 (WEA04)	06:29		18:47 (WEA05)	05:26	04:54
	16:32	17:31		18:25	11	17:58 (WEA04)	20:22	45	19:32 (WEA05)	21:16	21:55
15	08:34	07:45		06:41		17:46 (WEA04)	06:26		18:47 (WEA05)	05:25	04:54
	16:33	17:33		18:27	14	18:00 (WEA04)	20:24	43	19:30 (WEA05)	21:18	21:55
16	08:33	07:43		17:00 (WEA09)	06:39	17:44 (WEA04)	06:24		18:48 (WEA05)	05:23	04:54
	16:35	17:35	6	17:06 (WEA09)	18:29	18	18:02 (WEA04)	20:26	41	19:29 (WEA05)	21:19	21:56
17	08:32	07:41		16:57 (WEA09)	06:36	17:44 (WEA04)	06:22		18:48 (WEA05)	05:21	04:54
	16:37	17:37	10	17:07 (WEA09)	18:30	20	18:04 (WEA04)	20:27	41	19:29 (WEA05)	21:21	21:56
18	08:31	07:39		16:55 (WEA09)	06:34	17:43 (WEA04)	06:19		18:49 (WEA05)	05:20	04:54
	16:39	17:39	15	17:10 (WEA09)	18:32	23	18:06 (WEA04)	20:29	39	19:28 (WEA05)	21:22	21:57
19	08:30	07:37		16:54 (WEA09)	06:31	17:42 (WEA04)	06:17		18:49 (WEA05)	05:18	04:54
	16:40	17:41	18	17:12 (WEA09)	18:34	26	18:08 (WEA04)	20:31	37	19:26 (WEA05)	21:24	21:57
20	08:29	07:35		16:53 (WEA09)	06:29	17:42 (WEA04)	06:15		18:51 (WEA05)	05:17	04:54
	16:42	17:43	22	17:15 (WEA09)	18:36	28	18:10 (WEA04)	20:33	34	19:25 (WEA05)	21:26	21:58
21	08:27	07:32		16:51 (WEA09)	06:27	17:42 (WEA04)	06:13		18:52 (WEA05)	05:15	04:54
	16:44	17:45	25	17:16 (WEA09)	18:38	28	18:10 (WEA04)	20:35	31	19:23 (WEA05)	21:27	21:58
22	08:26	07:30		16:51 (WEA09)	06:24	17:42 (WEA04)	06:10		18:54 (WEA05)	05:14	04:54
	16:46	17:46	27	17:18 (WEA09)	18:40	28	18:10 (WEA04)	20:37	28	19:22 (WEA05)	21:29	21:58
23	08:25	07:28		16:50 (WEA09)	06:22	17:42 (WEA04)	06:08		18:56 (WEA05)	05:12	04:54
	16:48	17:48	31	17:21 (WEA09)	18:42	26	18:08 (WEA04)	20:38	24	19:20 (WEA05)	21:30	21:58
24	08:24	07:26		16:50 (WEA09)	06:19	17:43 (WEA04)	06:06		18:58 (WEA05)	05:11	04:54
	16:49	17:50	33	17:23 (WEA09)	18:43	25	18:08 (WEA04)	20:40	19	19:17 (WEA05)	21:32	21:58
25	08:22	07:23		16:49 (WEA09)	06:17	17:43 (WEA04)	06:04		19:02 (WEA05)	05:10	04:55
	16:51	17:52	34	17:23 (WEA09)	18:45	23	18:06 (WEA04)	20:42	11	19:13 (WEA05)	21:33	21:58
26	08:21	07:21		16:49 (WEA09)	06:14	17:44 (WEA04)	06:02				05:09	04:55
	16:53	17:54	34	17:23 (WEA09)	18:47	34	18:21 (WEA05)	20:44			21:35	21:58
27	08:19	07:19		16:49 (WEA09)	06:12	17:45 (WEA04)	05:59				05:07	04:56
	16:55	17:56	35	17:24 (WEA09)	18:49	36	18:22 (WEA05)	20:46			21:36	21:58
28	08:18	07:17		16:49 (WEA09)	06:10	17:48 (WEA04)	05:57				05:06	04:56
	16:57	17:58	34	17:23 (WEA09)	18:51	35	18:24 (WEA05)	20:48			21:37	21:58
29	08:16				07:07		18:59 (WEA05)	05:55			05:05	04:57
	16:59				19:53	28	19:27 (WEA05)	20:49			21:39	21:58
30	08:15				07:05		18:56 (WEA05)	05:53			05:04	04:57
	17:01				19:54	32	19:28 (WEA05)	20:51			21:40	21:58
31	08:13				07:02		18:55 (WEA05)				05:03	
	17:03				19:56	35	19:30 (WEA05)				21:41	
Sonnenscheinstunden	251	274			367		420			493		509
astr.max.mögl.Beschattung			324			709		968				
Red.Sonnenscheinwahrsch.			0,24			0,28		0,37				
Reduktion Betriebsdauer			0,95			0,95		0,95				
Reduktion Windrichtung			0,67			0,66		0,65				
Gesamte Reduktion			0,15			0,17		0,23				
Met.wahrsch.Beschattung			49			124		224				

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP04 - Wischhofstraße 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		05:38		06:31		18:46 (WEA05)	07:24	18:29 (WEA04)	07:22	08:17
	21:57		21:22		20:16	46	19:32 (WEA05)	19:03	5	18:34 (WEA04)	16:53	16:09
2	04:59		05:39		06:33		18:45 (WEA05)	07:26			07:24	08:18
	21:57		21:21		20:14	46	19:31 (WEA05)	19:01			16:51	16:08
3	05:00		05:41		06:35		18:45 (WEA05)	07:28			07:26	08:20
	21:57		21:19		20:12	46	19:31 (WEA05)	18:58			16:49	16:08
4	05:00		05:43		06:37		18:45 (WEA05)	07:30		17:40 (WEA09)	07:28	08:21
	21:56		21:17		20:09	46	19:31 (WEA05)	18:56	3	17:43 (WEA09)	16:47	16:07
5	05:01		05:44		06:38		18:44 (WEA05)	07:31		17:34 (WEA09)	07:30	08:22
	21:56		21:15		20:07	46	19:30 (WEA05)	18:53	15	17:49 (WEA09)	16:45	16:06
6	05:02		05:46		06:40		18:44 (WEA05)	07:33		17:31 (WEA09)	07:32	08:24
	21:55		21:13		20:04	46	19:30 (WEA05)	18:51	20	17:51 (WEA09)	16:43	16:06
7	05:03		05:48		06:42		18:45 (WEA05)	07:35		17:29 (WEA09)	07:34	08:25
	21:54		21:11		20:02	44	19:29 (WEA05)	18:49	24	17:53 (WEA09)	16:42	16:05
8	05:04		05:49		06:44		18:44 (WEA05)	07:37		17:27 (WEA09)	07:35	08:26
	21:54		21:09		20:00	44	19:28 (WEA05)	18:46	26	17:53 (WEA09)	16:40	16:05
9	05:05		05:51		06:45		18:45 (WEA05)	07:39		17:25 (WEA09)	07:37	08:28
	21:53		21:07		19:57	42	19:27 (WEA05)	18:44	29	17:54 (WEA09)	16:38	16:05
10	05:06		05:53		06:47		18:45 (WEA05)	07:41		17:24 (WEA09)	07:39	08:29
	21:52		21:05		19:55	41	19:26 (WEA05)	18:41	31	17:55 (WEA09)	16:36	16:04
11	05:07		05:55		06:49		18:46 (WEA05)	07:42		17:23 (WEA09)	07:41	08:30
	21:51		21:03		19:52	39	19:25 (WEA05)	18:39	32	17:55 (WEA09)	16:34	16:04
12	05:09		05:56		06:51		18:46 (WEA05)	07:44		17:23 (WEA09)	07:43	08:31
	21:50		21:01		19:50	36	19:22 (WEA05)	18:37	33	17:56 (WEA09)	16:33	16:04
13	05:10		05:58		06:52		18:47 (WEA05)	07:46		17:22 (WEA09)	07:45	08:32
	21:49		20:59		19:47	32	19:19 (WEA05)	18:34	34	17:56 (WEA09)	16:31	16:04
14	05:11		06:00		06:54		18:49 (WEA05)	07:48		17:22 (WEA09)	07:47	08:33
	21:48		20:57		19:45	28	19:17 (WEA05)	18:32	34	17:56 (WEA09)	16:30	16:04
15	05:12		06:02		06:56		18:38 (WEA04)	07:50		17:21 (WEA09)	07:49	08:34
	21:47		20:55		19:42	35	19:14 (WEA05)	18:30	35	17:56 (WEA09)	16:28	16:04
16	05:13		06:03		06:58		18:35 (WEA04)	07:52		17:21 (WEA09)	07:51	08:35
	21:46		20:53		19:40	36	19:12 (WEA05)	18:27	35	17:56 (WEA09)	16:26	16:04
17	05:15		06:05		06:59		18:33 (WEA04)	07:53		17:21 (WEA09)	07:53	08:36
	21:45		20:51		19:37	35	19:10 (WEA05)	18:25	34	17:55 (WEA09)	16:25	16:04
18	05:16		06:07		19:07 (WEA05)	07:01	18:30 (WEA04)	07:55		17:21 (WEA09)	07:54	08:37
	21:44		20:48	13	19:20 (WEA05)	19:35	23	18:53 (WEA04)	18:23	33	17:54 (WEA09)	16:24	16:04
19	05:18		06:09		19:03 (WEA05)	07:03		18:29 (WEA04)	07:57		17:22 (WEA09)	07:56	08:37
	21:42		20:46	20	19:23 (WEA05)	19:33	25	18:54 (WEA04)	18:21	29	17:51 (WEA09)	16:22	16:04
20	05:19		06:10		19:01 (WEA05)	07:05		18:28 (WEA04)	07:59		17:22 (WEA09)	07:58	08:38
	21:41		20:44	25	19:26 (WEA05)	19:30	27	18:55 (WEA04)	18:18	27	17:49 (WEA09)	16:21	16:05
21	05:20		06:12		18:58 (WEA05)	07:06		18:28 (WEA04)	08:01		17:23 (WEA09)	08:00	08:39
	21:40		20:42	29	19:27 (WEA05)	19:28	27	18:55 (WEA04)	18:16	24	17:47 (WEA09)	16:19	16:05
22	05:22		06:14		18:56 (WEA05)	07:08		18:26 (WEA04)	08:03		17:24 (WEA09)	08:02	08:39
	21:38		20:40	32	19:28 (WEA05)	19:25	28	18:54 (WEA04)	18:14	20	17:44 (WEA09)	16:18	16:06
23	05:23		06:16		18:55 (WEA05)	07:10		18:26 (WEA04)	08:05		17:25 (WEA09)	08:03	08:40
	21:37		20:37	35	19:30 (WEA05)	19:23	28	18:54 (WEA04)	18:12	17	17:42 (WEA09)	16:17	16:06
24	05:25		06:17		18:53 (WEA05)	07:12		18:26 (WEA04)	08:07		17:26 (WEA09)	08:05	08:40
	21:36		20:35	37	19:30 (WEA05)	19:20	26	18:52 (WEA04)	18:10	14	17:40 (WEA09)	16:16	16:07
25	05:26		06:19		18:52 (WEA05)	07:14		18:26 (WEA04)	07:09		16:28 (WEA09)	08:07	08:40
	21:34		20:33	39	19:31 (WEA05)	19:18	24	18:50 (WEA04)	17:07	9	16:37 (WEA09)	16:15	16:07
26	05:28		06:21		18:51 (WEA05)	07:15		18:25 (WEA04)	07:10		16:30 (WEA09)	08:08	08:41
	21:32		20:30	41	19:32 (WEA05)	19:15	22	18:47 (WEA04)	17:05	5	16:35 (WEA09)	16:14	16:08
27	05:29		06:23		18:49 (WEA05)	07:17		18:26 (WEA04)	07:12			08:10	08:41
	21:31		20:28	42	19:31 (WEA05)	19:13	18	18:44 (WEA04)	17:03			16:13	16:09
28	05:31		06:24		18:49 (WEA05)	07:19		18:26 (WEA04)	07:14			08:12	08:41
	21:29		20:26	43	19:32 (WEA05)	19:10	16	18:42 (WEA04)	17:01			16:12	16:10
29	05:33		06:26		18:48 (WEA05)	07:21		18:27 (WEA04)	07:16			08:13	08:41
	21:28		20:23	44	19:32 (WEA05)	19:08	13	18:40 (WEA04)	16:59			16:11	16:11
30	05:34		06:28		18:47 (WEA05)	07:22		18:28 (WEA04)	07:18			08:15	08:41
	21:26		20:21	45	19:32 (WEA05)	19:06	9	18:37 (WEA04)	16:57			16:10	16:12
31	05:36		06:30		18:46 (WEA05)				07:20				08:41
	21:24		20:19	46	19:32 (WEA05)				16:55				16:13
Sonnenscheinstunden	511		459			382			329			260	234
astr.max.mögl.Beschattung				491			974			568			
Red.Sonnenscheinwahrsch.				0,42			0,35			0,29			
Reduktion Betriebsdauer				0,95			0,95			0,95			
Reduktion Windrichtung				0,65			0,65			0,67			
Gesamte Reduktion				0,26			0,22			0,19			
Met.wahrsch.Beschattung				129			211			106			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP05 - Am Kamp 26, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März			April			Mai			Juni	
1	08:41	08:11	07:14			07:00		19:13 (WEA05)	05:51		19:47 (WEA06)	05:02
	16:14	17:05	18:00			19:58	18	19:31 (WEA05)	20:53	30	20:17 (WEA06)	21:43
2	08:41	08:10	07:12			06:57		19:13 (WEA05)	05:49		19:48 (WEA06)	05:01
	16:15	17:07	18:02			20:00	20	19:33 (WEA05)	20:55	30	20:18 (WEA06)	21:44
3	08:41	08:08	07:10			06:55		19:12 (WEA05)	05:47		19:48 (WEA06)	05:00
	16:16	17:09	18:04			20:02	23	19:35 (WEA05)	20:57	29	20:17 (WEA06)	21:45
4	08:41	08:06	07:07			06:52		19:13 (WEA05)	05:45		19:49 (WEA06)	04:59
	16:17	17:11	18:06			20:04	21	19:34 (WEA05)	20:58	27	20:16 (WEA06)	21:46
5	08:40	08:04	07:05			06:50		19:13 (WEA05)	05:43		19:49 (WEA06)	04:59
	16:19	17:13	18:08			20:05	21	19:34 (WEA05)	21:00	26	20:15 (WEA06)	21:47
6	08:40	08:03	07:03			06:48		19:14 (WEA05)	05:41		19:50 (WEA06)	04:58
	16:20	17:15	18:10			20:07	18	19:32 (WEA05)	21:02	24	20:14 (WEA06)	21:48
7	08:39	08:01	07:00			06:45		19:15 (WEA05)	05:39		19:50 (WEA06)	04:57
	16:21	17:17	18:12			20:09	15	19:30 (WEA05)	21:04	23	20:13 (WEA06)	21:49
8	08:39	07:59	06:58			06:43		19:17 (WEA05)	05:37		19:52 (WEA06)	04:57
	16:23	17:19	18:13			20:11	10	19:27 (WEA05)	21:05	21	20:13 (WEA06)	21:50
9	08:38	07:57	06:56			06:40			05:35		19:53 (WEA06)	04:56
	16:24	17:21	18:15			20:13			21:07	18	20:11 (WEA06)	21:51
10	08:38	07:55	06:53			06:38			05:33		19:54 (WEA06)	04:55
	16:26	17:23	18:17			20:15			21:09	15	20:09 (WEA06)	21:52
11	08:37	07:53	06:51			06:36			05:32		19:58 (WEA06)	04:55
	16:27	17:25	18:19			20:16			21:11	9	20:07 (WEA06)	21:53
12	08:36	07:51	06:48			06:33			05:30			04:55
	16:29	17:27	18:21			20:18			21:12			21:53
13	08:36	07:49	06:46			06:31			05:28			04:54
	16:30	17:29	18:23			20:20			21:14			21:54
14	08:35	07:47	06:44			06:29			05:26			04:54
	16:32	17:31	18:25			20:22			21:16			21:55
15	08:34	07:45	06:41			06:26			05:25			04:54
	16:33	17:33	18:27			20:24			21:18			21:55
16	08:33	07:43	06:39			06:24			05:23			04:54
	16:35	17:35	18:29			20:26			21:19			21:56
17	08:32	07:41	06:36			06:22			05:21			04:54
	16:37	17:37	18:30			20:27			21:21			21:56
18	08:31	07:39	06:34			06:19			05:20			04:54
	16:39	17:39	18:32			20:29			21:22			21:57
19	08:30	07:37	06:31			06:17		19:58 (WEA06)	05:18			04:54
	16:40	17:41	18:34			20:31	5	20:03 (WEA06)	21:24			21:57
20	08:29	07:34	06:29			06:15		19:55 (WEA06)	05:17			04:54
	16:42	17:43	18:36			20:33	9	20:04 (WEA06)	21:26			21:58
21	08:27	07:32	06:27			06:13		19:54 (WEA06)	05:15			04:54
	16:44	17:44	18:38			20:35	12	20:06 (WEA06)	21:27			21:58
22	08:26	07:30	06:24			06:10		19:52 (WEA06)	05:14			04:54
	16:46	17:46	18:40			20:37	16	20:08 (WEA06)	21:29			21:58
23	08:25	07:28	06:22			06:08		19:51 (WEA06)	05:12			04:54
	16:48	17:48	18:42			20:38	19	20:10 (WEA06)	21:30			21:58
24	08:24	07:26	06:19			06:06		19:50 (WEA06)	05:11			04:54
	16:49	17:50	18:43			20:40	22	20:12 (WEA06)	21:32			21:58
25	08:22	07:23	06:17			06:04		19:50 (WEA06)	05:10			04:55
	16:51	17:52	18:45			20:42	24	20:14 (WEA06)	21:33			21:58
26	08:21	07:21	06:14		18:20 (WEA05)	06:02		19:48 (WEA06)	05:08			04:55
	16:53	17:54	18:47	1	18:21 (WEA05)	20:44	26	20:14 (WEA06)	21:35			21:58
27	08:19	07:19	06:12		18:17 (WEA05)	05:59		19:48 (WEA06)	05:07			04:56
	16:55	17:56	18:49	5	18:22 (WEA05)	20:46	28	20:16 (WEA06)	21:36			21:58
28	08:18	07:17	06:09		18:16 (WEA05)	05:57		19:48 (WEA06)	05:06			04:56
	16:57	17:58	18:51	8	18:24 (WEA05)	20:48	30	20:18 (WEA06)	21:37			21:58
29	08:16		07:07		19:14 (WEA05)	05:55		19:47 (WEA06)	05:05			04:57
	16:59		19:53	12	19:26 (WEA05)	20:49	31	20:18 (WEA06)	21:39			21:58
30	08:15		07:05		19:14 (WEA05)	05:53		19:47 (WEA06)	05:04			04:57
	17:01		19:54	14	19:28 (WEA05)	20:51	30	20:17 (WEA06)	21:40			21:58
31	08:13		07:02		19:14 (WEA05)				05:03			
	17:03		19:56	16	19:30 (WEA05)				21:41			
Sonnenscheinstunden	251	274	367			420			493			509	
astr.max.mögl.Beschattung				56			398			252			
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43			
Reduktion Betriebsdauer				0,95			0,95			0,95			
Reduktion Windrichtung				0,65			0,63			0,62			
Gesamte Reduktion				0,17			0,22			0,25			
Met.wahrsch.Beschattung				10			89			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP05 - Am Kamp 26, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		05:38		20:10 (WEA06)	06:31		07:24	07:22	08:17
	21:57		21:22	4	20:14 (WEA06)	20:16		19:03	16:53	16:09
2	04:59		05:39		20:06 (WEA06)	06:33		07:26	07:24	08:18
	21:57		21:21	12	20:18 (WEA06)	20:14		19:01	16:51	16:08
3	05:00		05:41		20:04 (WEA06)	06:35		07:28	07:26	08:20
	21:56		21:19	16	20:20 (WEA06)	20:12		18:58	16:49	16:08
4	05:00		05:43		20:03 (WEA06)	06:37	19:15 (WEA05)	07:30	07:28	08:21
	21:56		21:17	19	20:22 (WEA06)	20:09	10 19:25 (WEA05)	18:56	16:47	16:07
5	05:01		05:44		20:01 (WEA06)	06:38	19:11 (WEA05)	07:31	07:30	08:22
	21:55		21:15	22	20:23 (WEA06)	20:07	15 19:26 (WEA05)	18:53	16:45	16:06
6	05:02		05:46		20:00 (WEA06)	06:40	19:10 (WEA05)	07:33	07:32	08:24
	21:55		21:13	24	20:24 (WEA06)	20:04	18 19:28 (WEA05)	18:51	16:43	16:06
7	05:03		05:48		19:59 (WEA06)	06:42	19:09 (WEA05)	07:35	07:34	08:25
	21:54		21:11	25	20:24 (WEA06)	20:02	20 19:29 (WEA05)	18:49	16:41	16:05
8	05:04		05:49		19:58 (WEA06)	06:44	19:07 (WEA05)	07:37	07:35	08:26
	21:54		21:09	27	20:25 (WEA06)	19:59	21 19:28 (WEA05)	18:46	16:40	16:05
9	05:05		05:51		19:58 (WEA06)	06:45	19:06 (WEA05)	07:39	07:37	08:28
	21:53		21:07	28	20:26 (WEA06)	19:57	23 19:29 (WEA05)	18:44	16:38	16:05
10	05:06		05:53		19:57 (WEA06)	06:47	19:06 (WEA05)	07:40	07:39	08:29
	21:52		21:05	29	20:26 (WEA06)	19:55	21 19:27 (WEA05)	18:41	16:36	16:04
11	05:07		05:55		19:57 (WEA06)	06:49	19:05 (WEA05)	07:42	07:41	08:30
	21:51		21:03	29	20:26 (WEA06)	19:52	19 19:24 (WEA05)	18:39	16:34	16:04
12	05:08		05:56		19:56 (WEA06)	06:51	19:05 (WEA05)	07:44	07:43	08:31
	21:50		21:01	30	20:26 (WEA06)	19:50	17 19:22 (WEA05)	18:37	16:33	16:04
13	05:10		05:58		19:56 (WEA06)	06:52	19:05 (WEA05)	07:46	07:45	08:32
	21:49		20:59	30	20:26 (WEA06)	19:47	14 19:19 (WEA05)	18:34	16:31	16:04
14	05:11		06:00		19:56 (WEA06)	06:54	19:06 (WEA05)	07:48	07:47	08:33
	21:48		20:57	30	20:26 (WEA06)	19:45	11 19:17 (WEA05)	18:32	16:30	16:04
15	05:12		06:01		19:55 (WEA06)	06:56	19:05 (WEA05)	07:50	07:49	08:34
	21:47		20:55	30	20:25 (WEA06)	19:42	9 19:14 (WEA05)	18:30	16:28	16:04
16	05:13		06:03		19:55 (WEA06)	06:58	19:06 (WEA05)	07:52	07:51	08:35
	21:46		20:53	28	20:23 (WEA06)	19:40	6 19:12 (WEA05)	18:27	16:26	16:04
17	05:15		06:05		19:56 (WEA06)	06:59	19:08 (WEA05)	07:53	07:52	08:36
	21:45		20:51	26	20:22 (WEA06)	19:37	2 19:10 (WEA05)	18:25	16:25	16:04
18	05:16		06:07		19:55 (WEA06)	07:01		07:55	07:54	08:37
	21:44		20:48	24	20:19 (WEA06)	19:35		18:23	16:24	16:04
19	05:17		06:08		19:56 (WEA06)	07:03		07:57	07:56	08:37
	21:42		20:46	21	20:17 (WEA06)	19:32		18:21	16:22	16:04
20	05:19		06:10		19:57 (WEA06)	07:05		07:59	07:58	08:38
	21:41		20:44	18	20:15 (WEA06)	19:30		18:18	16:21	16:05
21	05:20		06:12		19:57 (WEA06)	07:06		08:01	08:00	08:39
	21:40		20:42	16	20:13 (WEA06)	19:28		18:16	16:19	16:05
22	05:22		06:14		19:58 (WEA06)	07:08		08:03	08:02	08:39
	21:38		20:40	13	20:11 (WEA06)	19:25		18:14	16:18	16:06
23	05:23		06:15		20:00 (WEA06)	07:10		08:05	08:03	08:40
	21:37		20:37	9	20:09 (WEA06)	19:23		18:12	16:17	16:06
24	05:25		06:17		20:02 (WEA06)	07:12		08:07	08:05	08:40
	21:35		20:35	4	20:06 (WEA06)	19:20		18:10	16:16	16:07
25	05:26		06:19			07:13		07:09	08:07	08:40
	21:34		20:33			19:18		17:07	16:15	16:07
26	05:28		06:21			07:15		07:10	08:08	08:41
	21:32		20:30			19:15		17:05	16:14	16:08
27	05:29		06:23			07:17		07:12	08:10	08:41
	21:31		20:28			19:13		17:03	16:13	16:09
28	05:31		06:24			07:19		07:14	08:12	08:41
	21:29		20:26			19:10		17:01	16:12	16:10
29	05:33		06:26			07:21		07:16	08:13	08:41
	21:28		20:23			19:08		16:59	16:11	16:11
30	05:34		06:28			07:22		07:18	08:15	08:41
	21:26		20:21			19:05		16:57	16:10	16:12
31	05:36		06:30					07:20		08:41
	21:24		20:19					16:55		16:13
Sonnenscheinstunden	511		459			382		329	260	234
astr.max.mögl.Beschattung		514				206				
Red.Sonnenscheinwahrsch.		0,42				0,35				
Reduktion Betriebsdauer		0,95				0,95				
Reduktion Windrichtung		0,62				0,65				
Gesamte Reduktion		0,25				0,22				
Met.wahrsch.Beschattung		128				45				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP06 - Strother Heuweg 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März			April			Mai			Juni		
1	08:41	08:11	07:14			07:00		19:00 (WEA09)	05:51		19:51 (WEA05)	05:02		
	16:14	17:05	18:00			19:58	19	19:19 (WEA09)	20:53	28	20:19 (WEA05)	21:43		
2	08:41	08:10	07:12			06:57		19:02 (WEA09)	05:49		19:51 (WEA05)	05:01		
	16:15	17:07	18:02			20:00	15	19:17 (WEA09)	20:55	27	20:18 (WEA05)	21:44		
3	08:41	08:08	07:10			06:55		19:04 (WEA09)	05:47		19:51 (WEA05)	05:00		
	16:16	17:09	18:04			20:02	10	19:14 (WEA09)	20:57	27	20:18 (WEA05)	21:45		
4	08:41	08:06	07:07			06:52			05:45		19:52 (WEA05)	04:59		
	16:17	17:11	18:06			20:04			20:58	25	20:17 (WEA05)	21:46		
5	08:40	08:04	07:05			06:50			05:43		19:52 (WEA05)	04:59		
	16:19	17:13	18:08			20:05			21:00	24	20:16 (WEA05)	21:47		
6	08:40	08:03	07:03			06:48			05:41		19:53 (WEA05)	04:58		
	16:20	17:15	18:10			20:07			21:02	22	20:15 (WEA05)	21:48		
7	08:40	08:01	07:00			06:45			05:39		19:53 (WEA05)	04:57		
	16:21	17:17	18:12			20:09			21:04	21	20:14 (WEA05)	21:49		
8	08:39	07:59	06:58			06:43			05:37		19:55 (WEA05)	04:57		
	16:23	17:19	18:14			20:11			21:05	18	20:13 (WEA05)	21:50		
9	08:38	07:57	06:56			06:40			05:35		19:57 (WEA05)	04:56		
	16:24	17:21	18:15			20:13			21:07	14	20:11 (WEA05)	21:51		
10	08:38	07:55	06:53			06:38			05:33		19:59 (WEA05)	04:56		
	16:26	17:23	18:17			20:15			21:09	9	20:08 (WEA05)	21:52		
11	08:37	07:53	06:51			06:36			05:32			04:55		
	16:27	17:25	18:19			20:16			21:11			21:53		
12	08:36	07:51	06:48			06:33			05:30			04:55		21:17 (WEA06)
	16:29	17:27	18:21			20:18			21:12			21:53	1	21:18 (WEA06)
13	08:36	07:49	06:46			06:31			05:28			04:54		21:15 (WEA06)
	16:30	17:29	18:23			20:20			21:14			21:54	3	21:18 (WEA06)
14	08:35	07:47	06:44			06:29			05:26			04:54		21:15 (WEA06)
	16:32	17:31	18:25			20:22			21:16			21:55	4	21:19 (WEA06)
15	08:34	07:45	06:41			06:26			05:25			04:54		21:14 (WEA06)
	16:33	17:33	18:27			20:24			21:18			21:55	6	21:20 (WEA06)
16	08:33	07:43	06:39			06:24			05:23			04:54		21:14 (WEA06)
	16:35	17:35	18:29			20:26			21:19			21:56	6	21:20 (WEA06)
17	08:32	07:41	06:36			06:22			05:21			04:54		21:14 (WEA06)
	16:37	17:37	18:30			20:27			21:21			21:56	7	21:21 (WEA06)
18	08:31	07:39	06:34			06:19			05:20			04:54		21:14 (WEA06)
	16:39	17:39	18:32			20:29			21:22			21:57	7	21:21 (WEA06)
19	08:30	07:37	06:31			06:17		20:01 (WEA05)	05:18			04:54		21:14 (WEA06)
	16:40	17:41	18:34			20:31	2	20:03 (WEA05)	21:24			21:57	7	21:21 (WEA06)
20	08:29	07:34	06:29		18:07 (WEA09)	06:15		19:58 (WEA05)	05:17			04:54		21:14 (WEA06)
	16:42	17:43	18:36	3	18:10 (WEA09)	20:33	6	20:04 (WEA05)	21:26			21:58	8	21:22 (WEA06)
21	08:27	07:32	06:27		18:04 (WEA09)	06:13		19:56 (WEA05)	05:15			04:54		21:14 (WEA06)
	16:44	17:45	18:38	7	18:11 (WEA09)	20:35	10	20:06 (WEA05)	21:27			21:58	8	21:22 (WEA06)
22	08:26	07:30	06:24		18:03 (WEA09)	06:10		19:55 (WEA05)	05:14			04:54		21:15 (WEA06)
	16:46	17:46	18:40	11	18:14 (WEA09)	20:37	13	20:08 (WEA05)	21:29			21:58	8	21:23 (WEA06)
23	08:25	07:28	06:22		18:01 (WEA09)	06:08		19:54 (WEA05)	05:12			04:54		21:15 (WEA06)
	16:48	17:48	18:42	14	18:15 (WEA09)	20:38	16	20:10 (WEA05)	21:30			21:58	7	21:22 (WEA06)
24	08:24	07:26	06:19		18:01 (WEA09)	06:06		19:53 (WEA05)	05:11			04:54		21:15 (WEA06)
	16:49	17:50	18:43	16	18:17 (WEA09)	20:40	19	20:12 (WEA05)	21:32			21:58	7	21:22 (WEA06)
25	08:22	07:23	06:17		17:59 (WEA09)	06:04		19:52 (WEA05)	05:10			04:55		21:16 (WEA06)
	16:51	17:52	18:45	20	18:19 (WEA09)	20:42	22	20:14 (WEA05)	21:33			21:58	7	21:23 (WEA06)
26	08:21	07:21	06:14		17:59 (WEA09)	06:02		19:52 (WEA05)	05:09			04:55		21:16 (WEA06)
	16:53	17:54	18:47	22	18:21 (WEA09)	20:44	23	20:15 (WEA05)	21:35			21:58	6	21:22 (WEA06)
27	08:19	07:19	06:12		17:58 (WEA09)	05:59		19:50 (WEA05)	05:07			04:56		21:17 (WEA06)
	16:55	17:56	18:49	24	18:22 (WEA09)	20:46	26	20:16 (WEA05)	21:36			21:58	6	21:23 (WEA06)
28	08:18	07:17	06:09		17:59 (WEA09)	05:57		19:50 (WEA05)	05:06			04:56		21:17 (WEA06)
	16:57	17:58	18:51	24	18:23 (WEA09)	20:48	28	20:18 (WEA05)	21:37			21:58	5	21:22 (WEA06)
29	08:16		07:07		18:58 (WEA09)	05:55		19:50 (WEA05)	05:05			04:57		21:19 (WEA06)
	16:59		19:53	24	19:22 (WEA09)	20:49	29	20:19 (WEA05)	21:39			21:58	4	21:23 (WEA06)
30	08:15		07:05		18:59 (WEA09)	05:53		19:50 (WEA05)	05:04			04:57		21:19 (WEA06)
	17:01		19:54	23	19:22 (WEA09)	20:51	28	20:18 (WEA05)	21:40			21:58	3	21:22 (WEA06)
31	08:13		07:02		19:00 (WEA09)				05:03					
	17:03		19:56	21	19:21 (WEA09)				21:41					
Sonnenscheinstunden	251	274	367			420			493			509		
astr.max.mögl.Beschattung				209			266			215			110	
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95	
Reduktion Windrichtung				0,65			0,62			0,62			0,61	
Gesamte Reduktion				0,17			0,22			0,25			0,22	
Met.wahrsch.Beschattung				36			59			54			25	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP06 - Strother Heuweg 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober	November	Dezember
1	04:58		21:21 (WEA06)	05:38			06:31			07:24	07:22	08:17
	21:57	1	21:22 (WEA06)	21:22			20:16			19:03	16:53	16:09
2	04:59			05:39		20:12 (WEA05)	06:33			07:26	07:24	08:18
	21:57			21:21	3	20:15 (WEA05)	20:14			19:01	16:51	16:08
3	05:00			05:41		20:08 (WEA05)	06:35			07:28	07:26	08:20
	21:56			21:19	12	20:20 (WEA05)	20:12			18:58	16:49	16:08
4	05:00			05:43		20:07 (WEA05)	06:37			07:30	07:28	08:21
	21:56			21:17	15	20:22 (WEA05)	20:09			18:56	16:47	16:07
5	05:01			05:44		20:04 (WEA05)	06:38			07:31	07:30	08:22
	21:55			21:15	19	20:23 (WEA05)	20:07			18:53	16:45	16:06
6	05:02			05:46		20:04 (WEA05)	06:40			07:33	07:32	08:24
	21:55			21:13	20	20:24 (WEA05)	20:04			18:51	16:43	16:06
7	05:03			05:48		20:02 (WEA05)	06:42			07:35	07:34	08:25
	21:54			21:11	23	20:25 (WEA05)	20:02			18:49	16:41	16:05
8	05:04			05:49		20:01 (WEA05)	06:44			07:37	07:35	08:26
	21:54			21:09	25	20:26 (WEA05)	19:59			18:46	16:40	16:05
9	05:05			05:51		20:01 (WEA05)	06:45		18:59 (WEA09)	07:39	07:37	08:28
	21:53			21:07	26	20:27 (WEA05)	19:57	8	19:07 (WEA09)	18:44	16:38	16:05
10	05:06			05:53		20:00 (WEA05)	06:47		18:56 (WEA09)	07:40	07:39	08:29
	21:52			21:05	26	20:26 (WEA05)	19:55	14	19:10 (WEA09)	18:41	16:36	16:04
11	05:07			05:55		19:59 (WEA05)	06:49		18:53 (WEA09)	07:42	07:41	08:30
	21:51			21:03	28	20:27 (WEA05)	19:52	18	19:11 (WEA09)	18:39	16:34	16:04
12	05:08			05:56		19:58 (WEA05)	06:51		18:51 (WEA09)	07:44	07:43	08:31
	21:50			21:01	29	20:27 (WEA05)	19:50	21	19:12 (WEA09)	18:37	16:33	16:04
13	05:10			05:58		19:58 (WEA05)	06:52		18:50 (WEA09)	07:46	07:45	08:32
	21:49			20:59	29	20:27 (WEA05)	19:47	23	19:13 (WEA09)	18:34	16:31	16:04
14	05:11			06:00		19:59 (WEA05)	06:54		18:50 (WEA09)	07:48	07:47	08:33
	21:48			20:57	28	20:27 (WEA05)	19:45	23	19:13 (WEA09)	18:32	16:30	16:04
15	05:12			06:02		19:58 (WEA05)	06:56		18:48 (WEA09)	07:50	07:49	08:34
	21:47			20:55	27	20:25 (WEA05)	19:42	25	19:13 (WEA09)	18:30	16:28	16:04
16	05:13			06:03		19:58 (WEA05)	06:58		18:48 (WEA09)	07:52	07:51	08:35
	21:46			20:53	25	20:23 (WEA05)	19:40	24	19:12 (WEA09)	18:27	16:26	16:04
17	05:15			06:05		19:59 (WEA05)	06:59		18:48 (WEA09)	07:53	07:52	08:36
	21:45			20:51	23	20:22 (WEA05)	19:37	22	19:10 (WEA09)	18:25	16:25	16:04
18	05:16			06:07		19:58 (WEA05)	07:01		18:47 (WEA09)	07:55	07:54	08:37
	21:44			20:48	21	20:19 (WEA05)	19:35	20	19:07 (WEA09)	18:23	16:24	16:04
19	05:18			06:09		19:59 (WEA05)	07:03		18:47 (WEA09)	07:57	07:56	08:37
	21:42			20:46	18	20:17 (WEA05)	19:33	17	19:04 (WEA09)	18:21	16:22	16:04
20	05:19			06:10		20:00 (WEA05)	07:05		18:48 (WEA09)	07:59	07:58	08:38
	21:41			20:44	15	20:15 (WEA05)	19:30	14	19:02 (WEA09)	18:18	16:21	16:05
21	05:20			06:12		20:00 (WEA05)	07:06		18:48 (WEA09)	08:01	08:00	08:39
	21:40			20:42	13	20:13 (WEA05)	19:28	12	19:00 (WEA09)	18:16	16:19	16:05
22	05:22			06:14		20:01 (WEA05)	07:08		18:48 (WEA09)	08:03	08:02	08:39
	21:38			20:40	10	20:11 (WEA05)	19:25	9	18:57 (WEA09)	18:14	16:18	16:06
23	05:23			06:16		20:03 (WEA05)	07:10		18:50 (WEA09)	08:05	08:03	08:40
	21:37			20:37	6	20:09 (WEA05)	19:23	4	18:54 (WEA09)	18:12	16:17	16:06
24	05:25			06:17		20:05 (WEA05)	07:12			08:07	08:05	08:40
	21:35			20:35	1	20:06 (WEA05)	19:20			18:10	16:16	16:07
25	05:26			06:19			07:13			07:09	08:07	08:40
	21:34			20:33			19:18			17:07	16:15	16:07
26	05:28			06:21			07:15			07:10	08:08	08:41
	21:32			20:30			19:15			17:05	16:14	16:08
27	05:29			06:23			07:17			07:12	08:10	08:41
	21:31			20:28			19:13			17:03	16:13	16:09
28	05:31			06:24			07:19			07:14	08:12	08:41
	21:29			20:26			19:10			17:01	16:12	16:10
29	05:33			06:26			07:21			07:16	08:13	08:41
	21:28			20:23			19:08			16:59	16:11	16:11
30	05:34			06:28			07:22			07:18	08:15	08:41
	21:26			20:21			19:05			16:57	16:10	16:12
31	05:36			06:30						07:20		08:41
	21:24			20:19						16:55		16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		1			442			254				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,61			0,62			0,65				
Gesamte Reduktion		0,22			0,25			0,22				
Met.wahrsch.Beschattung		0			110			55				

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP07 - Driftweg 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

Januar		Februar		März			April			Mai			Juni		
1	08:41	08:11	07:14			07:00		19:08 (WEA02)	05:51		19:47 (WEA03)	05:02		19:29 (WEA09)
	16:14	17:05	18:00			19:58	23	19:31 (WEA02)	20:53	32	20:19 (WEA03)	21:43	99	21:08 (WEA04)
2	08:41	08:10	07:12		17:32 (WEA07)	06:57		19:09 (WEA02)	05:49		19:47 (WEA03)	05:01		19:30 (WEA09)
	16:15	17:07	18:02	3	17:35 (WEA07)	20:00	24	19:33 (WEA02)	20:55	31	20:18 (WEA03)	21:44	100	21:10 (WEA04)
3	08:41	08:08	07:10		17:30 (WEA07)	06:55		19:08 (WEA02)	05:47		19:47 (WEA03)	05:00		19:29 (WEA09)
	16:16	17:09	18:04	7	17:37 (WEA07)	20:02	24	19:32 (WEA02)	20:57	31	20:18 (WEA03)	21:45	101	21:10 (WEA04)
4	08:41	08:06	07:07		17:29 (WEA07)	06:53		19:09 (WEA02)	05:45		19:47 (WEA03)	04:59		19:29 (WEA09)
	16:17	17:11	18:06	10	17:39 (WEA07)	20:04	23	19:32 (WEA02)	20:58	30	20:17 (WEA03)	21:46	102	21:11 (WEA04)
5	08:40	08:05	07:05		17:27 (WEA07)	06:50		19:09 (WEA02)	05:43		19:48 (WEA03)	04:59		19:29 (WEA09)
	16:19	17:13	18:08	14	17:41 (WEA07)	20:06	22	19:31 (WEA02)	21:00	34	20:28 (WEA11)	21:47	104	21:13 (WEA04)
6	08:40	08:03	07:03		17:27 (WEA07)	06:48		19:09 (WEA02)	05:41		19:48 (WEA03)	04:58		19:29 (WEA09)
	16:20	17:15	18:10	16	17:43 (WEA07)	20:07	21	19:30 (WEA02)	21:02	36	20:29 (WEA11)	21:48	104	21:13 (WEA04)
7	08:40	08:01	07:00		17:26 (WEA07)	06:45		19:11 (WEA02)	05:39		19:48 (WEA03)	04:57		19:29 (WEA09)
	16:21	17:17	18:12	18	17:44 (WEA07)	20:09	17	19:28 (WEA02)	21:04	36	20:29 (WEA11)	21:49	105	21:14 (WEA04)
8	08:39	07:59	06:58		17:26 (WEA07)	06:43		19:13 (WEA02)	05:37		19:50 (WEA03)	04:57		19:29 (WEA09)
	16:23	17:19	18:14	21	17:47 (WEA07)	20:11	13	19:26 (WEA02)	21:06	35	20:30 (WEA11)	21:50	105	21:14 (WEA04)
9	08:38	07:57	06:56		17:26 (WEA07)	06:41		19:15 (WEA02)	05:35		19:50 (WEA03)	04:56		19:29 (WEA09)
	16:24	17:21	18:15	23	17:49 (WEA07)	20:13	7	19:22 (WEA02)	21:07	35	20:30 (WEA11)	21:51	106	21:15 (WEA04)
10	08:38	07:55	06:53		17:25 (WEA07)	06:38			05:34		19:51 (WEA03)	04:56		19:29 (WEA09)
	16:26	17:23	18:17	26	17:51 (WEA08)	20:15			21:09	39	20:30 (WEA11)	21:52	105	21:14 (WEA04)
11	08:37	07:53	06:51		17:26 (WEA07)	06:36			05:32		19:51 (WEA09)	04:55		19:29 (WEA09)
	16:27	17:25	18:19	27	17:53 (WEA08)	20:17			21:11	39	20:30 (WEA11)	21:53	106	21:15 (WEA04)
12	08:36	07:51	06:48		17:26 (WEA07)	06:33			05:30		19:48 (WEA09)	04:55		19:29 (WEA09)
	16:29	17:27	18:21	28	17:54 (WEA08)	20:18			21:12	41	20:29 (WEA11)	21:53	107	21:16 (WEA04)
13	08:36	07:49	06:46		17:25 (WEA08)	06:31			05:28		19:45 (WEA09)	04:54		19:29 (WEA09)
	16:30	17:29	18:23	32	17:57 (WEA08)	20:20			21:14	42	20:27 (WEA11)	21:54	106	21:15 (WEA04)
14	08:35	07:47	06:44		17:24 (WEA08)	06:29			05:26		19:44 (WEA09)	04:54		19:29 (WEA09)
	16:32	17:31	18:25	34	17:58 (WEA08)	20:22			21:16	45	20:29 (WEA09)	21:55	107	21:16 (WEA04)
15	08:34	07:45	06:41		17:24 (WEA08)	06:26			05:25		19:42 (WEA09)	04:54		19:29 (WEA09)
	16:34	17:33	18:27	34	17:58 (WEA08)	20:24			21:18	48	20:30 (WEA09)	21:55	107	21:16 (WEA04)
16	08:33	07:43	06:39		17:23 (WEA08)	06:24			05:23		19:41 (WEA09)	04:54		19:29 (WEA09)
	16:35	17:35	18:29	35	17:58 (WEA08)	20:26			21:19	51	20:32 (WEA09)	21:56	108	21:17 (WEA04)
17	08:32	07:41	06:36		17:23 (WEA08)	06:22			05:21		19:39 (WEA09)	04:54		19:30 (WEA09)
	16:37	17:37	18:31	35	17:58 (WEA08)	20:28			21:21	54	20:33 (WEA09)	21:56	107	21:17 (WEA04)
18	08:31	07:39	06:34		17:23 (WEA08)	06:19			05:20		19:38 (WEA09)	04:54		19:30 (WEA09)
	16:39	17:39	18:32	35	17:58 (WEA08)	20:29			21:22	57	20:35 (WEA09)	21:57	107	21:17 (WEA04)
19	08:30	07:37	06:32		17:23 (WEA08)	06:17		19:59 (WEA03)	05:18		19:37 (WEA09)	04:54		19:30 (WEA09)
	16:40	17:41	18:34	34	17:57 (WEA08)	20:31	4	20:03 (WEA03)	21:24	59	20:36 (WEA09)	21:57	107	21:17 (WEA04)
20	08:29	07:35	06:29		17:23 (WEA08)	06:15		19:56 (WEA03)	05:17		19:36 (WEA09)	04:54		19:30 (WEA09)
	16:42	17:43	18:36	34	17:57 (WEA08)	20:33	8	20:04 (WEA03)	21:26	61	20:37 (WEA09)	21:58	108	21:18 (WEA04)
21	08:27	07:32	06:27		17:23 (WEA08)	06:13		19:54 (WEA03)	05:15		19:35 (WEA09)	04:54		19:31 (WEA09)
	16:44	17:45	18:38	33	17:56 (WEA08)	20:35	12	20:06 (WEA03)	21:27	63	20:38 (WEA09)	21:58	108	21:19 (WEA04)
22	08:26	07:30	06:24		17:24 (WEA08)	06:10		19:52 (WEA03)	05:14		19:35 (WEA09)	04:54		19:31 (WEA09)
	16:46	17:47	18:40	31	17:55 (WEA08)	20:37	16	20:08 (WEA03)	21:29	69	20:54 (WEA04)	21:58	108	21:19 (WEA04)
23	08:25	07:28	06:22		17:24 (WEA08)	06:08		19:51 (WEA03)	05:13		19:33 (WEA09)	04:54		19:31 (WEA09)
	16:48	17:49	18:42	29	17:53 (WEA08)	20:39	19	20:10 (WEA03)	21:30	79	20:57 (WEA04)	21:58	108	21:19 (WEA04)
24	08:24	07:26	06:19		17:25 (WEA08)	06:06		19:50 (WEA03)	05:11		19:33 (WEA09)	04:55		19:31 (WEA09)
	16:49	17:50	18:43	27	17:52 (WEA08)	20:40	22	20:12 (WEA03)	21:32	83	20:58 (WEA04)	21:58	107	21:18 (WEA04)
25	08:22	07:24	06:17		17:26 (WEA08)	06:04		19:49 (WEA03)	05:10		19:32 (WEA09)	04:55		19:32 (WEA09)
	16:51	17:52	18:45	25	18:19 (WEA02)	20:42	25	20:14 (WEA03)	21:33	88	21:00 (WEA04)	21:58	107	21:19 (WEA04)
26	08:21	07:21	06:14		17:28 (WEA08)	06:02		19:49 (WEA03)	05:09		19:32 (WEA09)	04:55		19:32 (WEA09)
	16:53	17:54	18:47	26	18:21 (WEA02)	20:44	26	20:15 (WEA03)	21:35	89	21:01 (WEA04)	21:58	107	21:19 (WEA04)
27	08:19	07:19	06:12		17:30 (WEA08)	05:59		19:48 (WEA03)	05:07		19:31 (WEA09)	04:56		19:32 (WEA09)
	16:55	17:56	18:49	24	18:22 (WEA02)	20:46	29	20:17 (WEA03)	21:36	91	21:02 (WEA04)	21:58	108	21:20 (WEA04)
28	08:18	07:17	06:10		17:35 (WEA08)	05:57		19:48 (WEA03)	05:06		19:31 (WEA09)	04:56		19:32 (WEA09)
	16:57	17:58	18:51	17	18:24 (WEA02)	20:48	31	20:19 (WEA03)	21:37	93	21:04 (WEA04)	21:58	107	21:19 (WEA04)
29	08:16		07:07		19:11 (WEA02)	05:55		19:48 (WEA03)	05:05		19:30 (WEA09)	04:57		19:33 (WEA09)
	16:59		19:53	16	19:27 (WEA02)	20:49	31	20:19 (WEA03)	21:39	95	21:05 (WEA04)	21:58	107	21:20 (WEA04)
30	08:15		07:05		19:10 (WEA02)	05:53		19:47 (WEA03)	05:04		19:30 (WEA09)	04:57		19:33 (WEA09)
	17:01		19:54	18	19:28 (WEA02)	20:51	32	20:19 (WEA03)	21:40	96	21:06 (WEA04)	21:58	106	21:19 (WEA04)
31	08:13		07:02		19:09 (WEA02)				05:03		19:30 (WEA09)			
	17:03		19:56	21	19:30 (WEA02)				21:41	97	21:07 (WEA04)			
Sonnenscheinstunden	251	274	367			420			493			509		
astr.max.mögl.Beschattung				733			429			1779			3174	
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95	
Reduktion Windrichtung				0,65			0,63			0,62			0,62	
Gesamte Reduktion				0,17			0,22			0,25			0,23	
Met.wahrsch.Beschattung				126			96			453			726	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP07 - Driftweg 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		19:33 (WEA09)	05:38		19:59 (WEA09)	06:31		07:24	18:04 (WEA08)	07:22	08:17
	21:57	106	21:19 (WEA04)	21:22	41	20:40 (WEA11)	20:16		19:03	30	18:34 (WEA08)	16:53	16:09
2	04:59		19:34 (WEA09)	05:39		20:02 (WEA09)	06:33		07:26		18:04 (WEA07)	07:24	08:18
	21:57	106	21:20 (WEA04)	21:21	39	20:41 (WEA11)	20:14		19:01	28	18:32 (WEA08)	16:51	16:08
3	05:00		19:33 (WEA09)	05:41		20:01 (WEA03)	06:35	19:13 (WEA02)	07:28		18:03 (WEA07)	07:26	08:20
	21:57	106	21:19 (WEA04)	21:19	37	20:40 (WEA11)	20:12	7 19:20 (WEA02)	18:58	27	18:30 (WEA08)	16:49	16:08
4	05:00		19:34 (WEA09)	05:43		20:00 (WEA03)	06:37	19:10 (WEA02)	07:30		18:03 (WEA07)	07:28	08:21
	21:56	105	21:19 (WEA04)	21:17	35	20:41 (WEA11)	20:09	13 19:23 (WEA02)	18:56	24	18:27 (WEA07)	16:47	16:07
5	05:01		19:35 (WEA09)	05:44		19:59 (WEA03)	06:38	19:07 (WEA02)	07:31		18:03 (WEA07)	07:30	08:22
	21:56	104	21:19 (WEA04)	21:15	35	20:40 (WEA11)	20:07	17 19:24 (WEA02)	18:53	22	18:25 (WEA07)	16:45	16:06
6	05:02		19:35 (WEA09)	05:46		19:58 (WEA03)	06:40	19:06 (WEA02)	07:33		18:03 (WEA07)	07:32	08:24
	21:55	104	21:19 (WEA04)	21:13	37	20:40 (WEA11)	20:04	20 19:26 (WEA02)	18:51	20	18:23 (WEA07)	16:43	16:06
7	05:03		19:36 (WEA09)	05:48		19:57 (WEA03)	06:42	19:05 (WEA02)	07:35		18:03 (WEA07)	07:34	08:25
	21:54	103	21:19 (WEA04)	21:11	35	20:38 (WEA11)	20:02	21 19:26 (WEA02)	18:49	17	18:20 (WEA07)	16:42	16:05
8	05:04		19:36 (WEA09)	05:49		19:57 (WEA03)	06:44	19:03 (WEA02)	07:37		18:02 (WEA07)	07:36	08:26
	21:54	103	21:19 (WEA04)	21:09	32	20:36 (WEA11)	20:00	23 19:26 (WEA02)	18:46	15	18:17 (WEA07)	16:40	16:05
9	05:05		19:37 (WEA09)	05:51		19:57 (WEA03)	06:45	19:02 (WEA02)	07:39		18:03 (WEA07)	07:37	08:28
	21:53	101	21:18 (WEA04)	21:07	30	20:27 (WEA03)	19:57	25 19:27 (WEA02)	18:44	12	18:15 (WEA07)	16:38	16:05
10	05:06		19:37 (WEA09)	05:53		19:56 (WEA03)	06:47	19:02 (WEA02)	07:41		18:03 (WEA07)	07:39	08:29
	21:52	101	21:18 (WEA04)	21:05	31	20:27 (WEA03)	19:55	25 19:27 (WEA02)	18:41	9	18:12 (WEA07)	16:36	16:04
11	05:07		19:37 (WEA09)	05:55		19:56 (WEA03)	06:49	19:02 (WEA02)	07:42		18:05 (WEA07)	07:41	08:30
	21:51	100	21:17 (WEA04)	21:03	31	20:27 (WEA03)	19:52	23 19:25 (WEA02)	18:39	5	18:10 (WEA07)	16:35	16:04
12	05:09		19:38 (WEA09)	05:56		19:56 (WEA03)	06:51	19:01 (WEA02)	07:44		18:07 (WEA07)	07:43	08:31
	21:50	98	21:16 (WEA04)	21:01	31	20:27 (WEA03)	19:50	21 19:22 (WEA02)	18:37	1	18:08 (WEA07)	16:33	16:04
13	05:10		19:38 (WEA09)	05:58		19:55 (WEA03)	06:52	19:01 (WEA02)	07:46			07:45	08:32
	21:49	97	21:15 (WEA04)	20:59	32	20:27 (WEA03)	19:47	18 19:19 (WEA02)	18:34			16:31	16:04
14	05:11		19:39 (WEA09)	06:00		19:55 (WEA03)	06:54	19:01 (WEA02)	07:48			07:47	08:33
	21:48	95	21:14 (WEA04)	20:57	32	20:27 (WEA03)	19:45	16 19:17 (WEA02)	18:32			16:30	16:04
15	05:12		19:39 (WEA09)	06:02		19:55 (WEA03)	06:56	19:01 (WEA02)	07:50			07:49	08:34
	21:47	94	21:13 (WEA04)	20:55	30	20:25 (WEA03)	19:42	13 19:14 (WEA02)	18:30			16:28	16:04
16	05:14		19:41 (WEA09)	06:03		19:55 (WEA03)	06:58	18:20 (WEA08)	07:52			07:51	08:35
	21:46	92	21:13 (WEA04)	20:53	28	20:23 (WEA03)	19:40	24 19:12 (WEA02)	18:27			16:27	16:04
17	05:15		19:41 (WEA09)	06:05		19:56 (WEA03)	06:59	18:17 (WEA08)	07:53			07:53	08:36
	21:45	90	21:11 (WEA04)	20:51	26	20:22 (WEA03)	19:37	26 19:10 (WEA02)	18:25			16:25	16:04
18	05:16		19:41 (WEA09)	06:07		19:55 (WEA03)	07:01	18:15 (WEA08)	07:55			07:54	08:37
	21:44	89	21:10 (WEA04)	20:48	24	20:19 (WEA03)	19:35	26 19:08 (WEA02)	18:23			16:24	16:04
19	05:18		19:42 (WEA09)	06:09		19:56 (WEA03)	07:03	18:12 (WEA08)	07:57			07:56	08:37
	21:42	86	21:09 (WEA04)	20:46	21	20:17 (WEA03)	19:33	26 18:38 (WEA08)	18:21			16:22	16:05
20	05:19		19:43 (WEA09)	06:10		19:57 (WEA03)	07:05	18:11 (WEA08)	07:59			07:58	08:38
	21:41	81	21:08 (WEA04)	20:44	18	20:15 (WEA03)	19:30	29 18:40 (WEA08)	18:18			16:21	16:05
21	05:20		19:44 (WEA09)	06:12		19:57 (WEA03)	07:06	18:09 (WEA08)	08:01			08:00	08:39
	21:40	76	21:07 (WEA04)	20:42	16	20:13 (WEA03)	19:28	31 18:40 (WEA08)	18:16			16:20	16:05
22	05:22		19:44 (WEA09)	06:14		19:59 (WEA03)	07:08	18:08 (WEA08)	08:03			08:02	08:39
	21:38	64	20:48 (WEA09)	20:40	12	20:11 (WEA03)	19:25	32 18:40 (WEA08)	18:14			16:18	16:06
23	05:23		19:46 (WEA09)	06:16		20:01 (WEA03)	07:10	18:07 (WEA08)	08:05			08:03	08:40
	21:37	62	20:48 (WEA09)	20:37	8	20:09 (WEA03)	19:23	33 18:40 (WEA08)	18:12			16:17	16:06
24	05:25		19:46 (WEA09)	06:17		20:03 (WEA03)	07:12	18:06 (WEA08)	08:07			08:05	08:40
	21:36	61	20:47 (WEA09)	20:35	3	20:06 (WEA03)	19:20	35 18:41 (WEA08)	18:10			16:16	16:07
25	05:26		19:48 (WEA09)	06:19			07:14	18:06 (WEA08)	07:09			08:07	08:40
	21:34	58	20:46 (WEA09)	20:33			19:18	35 18:41 (WEA08)	17:07			16:15	16:08
26	05:28		19:49 (WEA09)	06:21			07:15	18:06 (WEA08)	07:10			08:09	08:41
	21:32	56	20:45 (WEA09)	20:30			19:15	35 18:41 (WEA08)	17:05			16:14	16:08
27	05:30		19:50 (WEA09)	06:23			07:17	18:04 (WEA08)	07:12			08:10	08:41
	21:31	53	20:43 (WEA09)	20:28			19:13	36 18:40 (WEA08)	17:03			16:13	16:09
28	05:31		19:52 (WEA09)	06:24			07:19	18:04 (WEA08)	07:14			08:12	08:41
	21:29	50	20:42 (WEA09)	20:26			19:10	35 18:39 (WEA08)	17:01			16:12	16:10
29	05:33		19:53 (WEA09)	06:26			07:21	18:05 (WEA08)	07:16			08:13	08:41
	21:28	47	20:40 (WEA09)	20:23			19:08	34 18:39 (WEA08)	16:59			16:11	16:11
30	05:34		19:55 (WEA09)	06:28			07:22	18:05 (WEA08)	07:18			08:15	08:41
	21:26	44	20:39 (WEA09)	20:21			19:06	32 18:37 (WEA08)	16:57			16:10	16:12
31	05:36		19:56 (WEA09)	06:30					07:20				08:41
	21:24	42	20:38 (WEA11)	20:19					16:55				16:13
Sonnenscheinstunden	511			459			382		329			260	234
astr.max.mögl.Beschattung		2574			664			711		210			
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35		0,29			
Reduktion Betriebsdauer		0,95			0,95			0,95		0,95			
Reduktion Windrichtung		0,62			0,62			0,65		0,65			
Gesamte Reduktion		0,22			0,25			0,22		0,18			
Met.wahrsch.Beschattung		576			166			154		38			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April	Mai	Juni
1	08:41		09:23 (WEA05) | 08:12		09:28 (WEA05) | 07:14		07:39 (WEA06) | 07:00	| 05:51	| 05:02
	16:14	138	15:19 (WEA02) | 17:05	67	16:14 (WEA11) | 18:00	18	07:57 (WEA06) | 19:58	| 20:53	| 21:43
2	08:41		09:23 (WEA05) | 08:10		09:28 (WEA05) | 07:12		07:37 (WEA06) | 06:57	| 05:49	| 05:01
	16:15	137	15:19 (WEA02) | 17:07	67	16:14 (WEA11) | 18:02	23	08:00 (WEA06) | 20:00	| 20:55	| 21:44
3	08:41		09:24 (WEA05) | 08:08		09:29 (WEA05) | 07:10		07:34 (WEA06) | 06:55	| 05:47	| 05:00
	16:16	135	15:20 (WEA02) | 17:09	67	16:15 (WEA11) | 18:04	27	08:01 (WEA06) | 20:02	| 20:57	| 21:45
4	08:41		09:23 (WEA05) | 08:06		09:31 (WEA05) | 07:08		07:32 (WEA06) | 06:53	| 05:45	| 04:59
	16:17	136	15:20 (WEA02) | 17:11	65	16:16 (WEA11) | 18:06	31	08:03 (WEA06) | 20:04	| 20:59	| 21:46
5	08:40		09:24 (WEA05) | 08:05		09:31 (WEA05) | 07:05		07:29 (WEA06) | 06:50	| 05:43	| 04:59
	16:19	134	15:20 (WEA02) | 17:13	64	16:16 (WEA11) | 18:08	34	08:03 (WEA06) | 20:06	| 21:00	| 21:47
6	08:40		09:23 (WEA05) | 08:03		09:32 (WEA05) | 07:03		07:28 (WEA06) | 06:48	| 05:41	| 04:58
	16:20	134	15:20 (WEA02) | 17:15	63	16:16 (WEA11) | 18:10	36	08:04 (WEA06) | 20:07	| 21:02	| 21:48
7	08:40		09:23 (WEA05) | 08:01		09:33 (WEA05) | 07:00		07:27 (WEA06) | 06:45	| 05:39	| 04:57
	16:21	133	15:20 (WEA02) | 17:17	60	16:16 (WEA11) | 18:12	38	08:05 (WEA06) | 20:09	| 21:04	| 21:49
8	08:39		09:24 (WEA05) | 07:59		09:34 (WEA05) | 06:58		07:26 (WEA06) | 06:43	| 05:37	| 04:57
	16:23	130	15:20 (WEA02) | 17:19	56	16:15 (WEA11) | 18:14	39	08:05 (WEA06) | 20:11	| 21:06	| 21:50
9	08:39		09:24 (WEA05) | 07:57		09:35 (WEA05) | 06:56		07:25 (WEA06) | 06:41	| 05:35	| 04:56
	16:24	128	15:20 (WEA02) | 17:21	52	16:14 (WEA11) | 18:16	41	08:06 (WEA06) | 20:13	| 21:07	| 21:51
10	08:38		09:24 (WEA05) | 07:55		09:37 (WEA05) | 06:53		07:24 (WEA06) | 06:38	| 05:34	| 04:56
	16:26	125	15:20 (WEA02) | 17:23	45	16:12 (WEA11) | 18:17	42	08:06 (WEA06) | 20:15	| 21:09	| 21:52
11	08:37		09:24 (WEA05) | 07:53		09:37 (WEA05) | 06:51		07:24 (WEA06) | 06:36	| 05:32	| 04:55
	16:27	122	15:19 (WEA02) | 17:25	35	10:12 (WEA05) | 18:19	42	08:06 (WEA06) | 20:17	| 21:11	| 21:53
12	08:37		09:24 (WEA05) | 07:51		09:39 (WEA05) | 06:49		07:23 (WEA06) | 06:33	| 05:30	| 04:55
	16:29	118	15:18 (WEA02) | 17:27	31	10:10 (WEA05) | 18:21	43	08:06 (WEA06) | 20:18	| 21:13	| 21:54
13	08:36		09:24 (WEA05) | 07:49		09:42 (WEA05) | 06:46		07:23 (WEA06) | 06:31	| 05:28	| 04:54
	16:30	112	15:17 (WEA02) | 17:29	26	10:08 (WEA05) | 18:23	43	08:06 (WEA06) | 20:20	| 21:14	| 21:54
14	08:35		09:24 (WEA05) | 07:47		09:45 (WEA05) | 06:44		07:22 (WEA06) | 06:29	| 05:26	| 04:54
	16:32	102	15:16 (WEA02) | 17:31	20	10:05 (WEA05) | 18:25	43	08:05 (WEA06) | 20:22	| 21:16	| 21:55
15	08:34		09:24 (WEA05) | 07:45		09:49 (WEA05) | 06:41		07:23 (WEA06) | 06:26	| 05:25	| 04:54
	16:34	84	15:06 (WEA03) | 17:33	18	17:00 (WEA10) | 18:27	42	08:05 (WEA06) | 20:24	| 21:18	| 21:56
16	08:33		09:24 (WEA05) | 07:43		16:52 (WEA10) | 06:39		07:23 (WEA06) | 06:24	| 05:23	| 04:54
	16:35	83	15:05 (WEA03) | 17:35	9	17:01 (WEA10) | 18:29	42	08:05 (WEA06) | 20:26	| 21:19	| 21:56
17	08:32		09:25 (WEA05) | 07:41		16:51 (WEA10) | 06:36		07:23 (WEA06) | 06:22	| 05:21	| 04:54
	16:37	81	15:05 (WEA03) | 17:37	11	17:02 (WEA10) | 18:31	40	08:03 (WEA06) | 20:28	| 21:21	| 21:57
18	08:31		09:24 (WEA05) | 07:39		16:50 (WEA10) | 06:34		07:23 (WEA06) | 06:20	| 05:20	| 04:54
	16:39	81	15:04 (WEA03) | 17:39	12	17:02 (WEA10) | 18:32	40	08:03 (WEA06) | 20:29	| 21:23	| 21:57
19	08:30		09:24 (WEA05) | 07:37		16:50 (WEA10) | 06:32		07:23 (WEA06) | 06:17	| 05:18	| 04:54
	16:40	78	15:03 (WEA03) | 17:41	12	17:02 (WEA10) | 18:34	38	08:01 (WEA06) | 20:31	| 21:24	| 21:57
20	08:29		09:25 (WEA05) | 07:35		16:51 (WEA10) | 06:29		07:24 (WEA06) | 06:15	| 05:17	| 04:54
	16:42	76	15:03 (WEA03) | 17:43	11	17:02 (WEA10) | 18:36	36	08:00 (WEA06) | 20:33	| 21:26	| 21:58
21	08:28		09:25 (WEA05) | 07:32		16:52 (WEA10) | 06:27		07:25 (WEA06) | 06:13	| 05:15	| 04:54
	16:44	78	16:05 (WEA13) | 17:45	9	17:01 (WEA10) | 18:38	34	07:59 (WEA06) | 20:35	| 21:27	| 21:58
22	08:26		09:25 (WEA05) | 07:30		16:53 (WEA10) | 06:24		07:26 (WEA06) | 06:10	| 05:14	| 04:54
	16:46	76	16:07 (WEA13) | 17:47	6	16:59 (WEA10) | 18:40	31	07:57 (WEA06) | 20:37	| 21:29	| 21:58
23	08:25		09:25 (WEA05) | 07:28		| 06:22		07:27 (WEA06) | 06:08	| 05:13	| 04:54
	16:48	69	16:08 (WEA13) | 17:49		| 18:42	28	07:55 (WEA06) | 20:39	| 21:30	| 21:58
24	08:24		09:26 (WEA05) | 07:26		| 06:19		07:29 (WEA06) | 06:06	| 05:11	| 04:55
	16:49	66	16:09 (WEA13) | 17:50		| 18:44	24	07:53 (WEA06) | 20:40	| 21:32	| 21:58
25	08:22		09:25 (WEA05) | 07:24		| 06:17		07:30 (WEA06) | 06:04	| 05:10	| 04:55
	16:51	67	16:09 (WEA13) | 17:52		| 18:45	19	07:49 (WEA06) | 20:42	| 21:33	| 21:58
26	08:21		09:26 (WEA05) | 07:21		| 06:14		07:35 (WEA06) | 06:02	| 05:09	| 04:55
	16:53	67	16:10 (WEA13) | 17:54		| 18:47	10	07:45 (WEA06) | 20:44	| 21:35	| 21:58
27	08:19		09:26 (WEA05) | 07:19		| 06:12		| 05:59	| 05:07	| 04:56
	16:55	67	16:10 (WEA13) | 17:56		| 18:49		| 20:46	| 21:36	| 21:58
28	08:18		09:26 (WEA05) | 07:17		07:41 (WEA06) | 06:10		| 05:57	| 05:06	| 04:56
	16:57	66	16:10 (WEA13) | 17:58	12	07:53 (WEA06) | 18:51		| 20:48	| 21:38	| 21:58
29	08:16		09:27 (WEA05) |		| 07:07		| 05:55	| 05:05	| 04:57
	16:59	65	16:10 (WEA13) |		| 19:53		| 20:50	| 21:39	| 21:58
30	08:15		09:28 (WEA05) |		| 07:05		| 05:53	| 05:04	| 04:57
	17:01	64	16:12 (WEA11) |		| 19:55		| 20:51	| 21:40	| 21:58
31	08:13		09:28 (WEA05) |		| 07:02		|	| 05:03	|
	17:03	65	16:13 (WEA11) |		| 19:56		|	| 21:41	|
Sonnenscheinstunden	251		| 274		| 367		| 420	| 493	| 509
astr.max.mögl.Beschattung		3017	|	818	|	884	|	|	|
Red.Sonnenscheinwahrsch.		0,17	|	0,24	|	0,28	|	|	|
Reduktion Betriebsdauer		0,95	|	0,95	|	0,95	|	|	|
Reduktion Windrichtung		0,63	|	0,62	|	0,62	|	|	|
Gesamte Reduktion		0,10	|	0,14	|	0,16	|	|	|
Met.wahrsch.Beschattung		310	|	116	|	144	|	|	|

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP08 - Haneworth 1, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September			Oktober			November			Dezember		
1	04:58		05:38		06:31			07:24		08:03 (WEA06)	07:22		09:05 (WEA05)	08:17		09:06 (WEA05)
	21:57		21:23		20:16			19:03	42	08:45 (WEA06)	16:53	46	15:41 (WEA11)	16:09	123	15:01 (WEA02)
2	04:59		05:39		06:33			07:26		08:02 (WEA06)	07:24		09:04 (WEA05)	08:18		09:07 (WEA05)
	21:57		21:21		20:14			19:01	42	08:44 (WEA06)	16:51	53	15:43 (WEA11)	16:08	125	15:03 (WEA02)
3	05:00		05:41		06:35			07:28		08:02 (WEA06)	07:26		09:04 (WEA05)	08:20		09:07 (WEA05)
	21:57		21:19		20:12			18:58	42	08:44 (WEA06)	16:49	57	15:45 (WEA11)	16:08	128	15:03 (WEA02)
4	05:00		05:43		06:37			07:30		08:02 (WEA06)	07:28		09:03 (WEA05)	08:21		09:08 (WEA05)
	21:56		21:17		20:09			18:56	41	08:43 (WEA06)	16:47	60	15:45 (WEA11)	16:07	130	15:04 (WEA02)
5	05:01		05:44		06:38			07:31		08:02 (WEA06)	07:30		09:02 (WEA05)	08:23		09:08 (WEA05)
	21:56		21:15		20:07			18:53	41	08:43 (WEA06)	16:45	63	15:46 (WEA11)	16:06	133	15:05 (WEA02)
6	05:02		05:46		06:40			07:33		08:03 (WEA06)	07:32		09:01 (WEA05)	08:24		09:09 (WEA05)
	21:55		21:13		20:04			18:51	39	08:42 (WEA06)	16:43	64	15:46 (WEA11)	16:06	134	15:06 (WEA02)
7	05:03		05:48		06:42			07:35		08:04 (WEA06)	07:34		09:00 (WEA05)	08:25		09:10 (WEA05)
	21:54		21:11		20:02			18:49	37	08:41 (WEA06)	16:42	66	15:46 (WEA11)	16:05	134	15:06 (WEA02)
8	05:04		05:49		06:44			07:37		08:03 (WEA06)	07:36		09:00 (WEA05)	08:27		09:11 (WEA05)
	21:54		21:09		20:00			18:46	36	08:39 (WEA06)	16:40	67	15:46 (WEA11)	16:05	136	15:08 (WEA02)
9	05:05		05:51		06:45			07:39		08:05 (WEA06)	07:38		08:59 (WEA05)	08:28		09:12 (WEA05)
	21:53		21:07		19:57			18:44	33	08:38 (WEA06)	16:38	67	15:45 (WEA11)	16:05	135	15:08 (WEA02)
10	05:06		05:53		06:47			07:41		08:07 (WEA06)	07:39		08:59 (WEA05)	08:29		09:12 (WEA05)
	21:52		21:05		19:55			18:42	29	08:36 (WEA06)	16:36	66	15:45 (WEA11)	16:04	138	15:09 (WEA02)
11	05:07		05:55		06:49			07:42		08:09 (WEA06)	07:41		08:59 (WEA05)	08:30		09:13 (WEA05)
	21:51		21:03		19:52			18:39	25	08:34 (WEA06)	16:35	65	15:44 (WEA11)	16:04	138	15:09 (WEA02)
12	05:09		05:56		06:51			07:44		08:11 (WEA06)	07:43		08:58 (WEA05)	08:31		09:14 (WEA05)
	21:50		21:01		19:50			18:37	21	08:32 (WEA06)	16:33	64	15:42 (WEA11)	16:04	138	15:10 (WEA02)
13	05:10		05:58		06:52			07:46		08:13 (WEA06)	07:45		08:59 (WEA05)	08:32		09:15 (WEA05)
	21:49		20:59		19:47			18:34	16	08:29 (WEA06)	16:31	65	15:42 (WEA13)	16:04	139	15:11 (WEA02)
14	05:11		06:00		06:54			07:48		08:16 (WEA06)	07:47		08:59 (WEA05)	08:33		09:15 (WEA05)
	21:48		20:57		19:45			18:32	8	08:24 (WEA06)	16:30	66	15:43 (WEA13)	16:04	139	15:11 (WEA02)
15	05:12		06:02		06:56			07:50			07:49		08:59 (WEA05)	08:34		09:16 (WEA05)
	21:47		20:55		19:42			18:30			16:28	67	15:43 (WEA13)	16:04	139	15:12 (WEA02)
16	05:14		06:03		06:58			07:52			07:51		08:59 (WEA05)	08:35		09:17 (WEA05)
	21:46		20:53		19:40			18:28			16:27	67	15:43 (WEA13)	16:04	139	15:13 (WEA02)
17	05:15		06:05		06:59		08:25 (WEA06)	07:54			07:53		08:59 (WEA05)	08:36		09:17 (WEA05)
	21:45		20:51		19:38	7	08:32 (WEA06)	18:25			16:25	66	15:43 (WEA13)	16:04	139	15:12 (WEA02)
18	05:16		06:07		07:01		08:20 (WEA06)	07:55			07:54		09:00 (WEA05)	08:37		09:18 (WEA05)
	21:44		20:49		19:35	17	08:37 (WEA06)	18:23			16:24	66	15:43 (WEA13)	16:04	139	15:13 (WEA02)
19	05:18		06:09		07:03		08:16 (WEA06)	07:57			07:56		09:00 (WEA05)	08:37		09:18 (WEA05)
	21:43		20:46		19:33	23	08:39 (WEA06)	18:21			16:22	69	15:43 (WEA13)	16:05	140	15:14 (WEA02)
20	05:19		06:10		07:05		08:14 (WEA06)	07:59		17:23 (WEA10)	07:58		09:00 (WEA05)	08:38		09:18 (WEA05)
	21:41		20:44		19:30	27	08:41 (WEA06)	18:18	8	17:31 (WEA10)	16:21	76	15:42 (WEA13)	16:05	139	15:14 (WEA02)
21	05:20		06:12		07:07		08:12 (WEA06)	08:01		17:22 (WEA10)	08:00		09:01 (WEA05)	08:39		09:19 (WEA05)
	21:40		20:42		19:28	30	08:42 (WEA06)	18:16	10	17:32 (WEA10)	16:20	78	15:41 (WEA13)	16:05	139	15:15 (WEA02)
22	05:22		06:14		07:08		08:10 (WEA06)	08:03		17:21 (WEA10)	08:02		09:01 (WEA05)	08:39		09:19 (WEA05)
	21:39		20:40		19:25	34	08:44 (WEA06)	18:14	11	17:32 (WEA10)	16:18	76	14:39 (WEA03)	16:06	139	15:15 (WEA02)
23	05:23		06:16		07:10		08:08 (WEA06)	08:05		17:21 (WEA10)	08:03		09:02 (WEA05)	08:40		09:20 (WEA05)
	21:37		20:37		19:23	36	08:44 (WEA06)	18:12	12	17:33 (WEA10)	16:17	78	14:40 (WEA03)	16:06	140	15:16 (WEA02)
24	05:25		06:17		07:12		08:07 (WEA06)	08:07		17:21 (WEA10)	08:05		09:02 (WEA05)	08:40		09:20 (WEA05)
	21:36		20:35		19:20	38	08:45 (WEA06)	18:10	11	17:32 (WEA10)	16:16	81	14:42 (WEA03)	16:07	140	15:16 (WEA02)
25	05:26		06:19		07:14		08:06 (WEA06)	07:09		16:21 (WEA10)	08:07		09:02 (WEA05)	08:41		09:20 (WEA05)
	21:34		20:33		19:18	39	08:45 (WEA06)	17:07	11	16:32 (WEA10)	16:15	81	14:42 (WEA03)	16:08	140	15:16 (WEA02)
26	05:28		06:21		07:15		08:06 (WEA06)	07:11		16:22 (WEA10)	08:09		09:02 (WEA05)	08:41		09:22 (WEA05)
	21:33		20:31		19:15	40	08:46 (WEA06)	17:05	9	16:31 (WEA10)	16:14	83	14:43 (WEA03)	16:08	139	15:17 (WEA02)
27	05:30		06:23		07:17		08:04 (WEA06)	07:12		09:17 (WEA05)	08:10		09:03 (WEA05)	08:41		09:22 (WEA05)
	21:31		20:28		19:13	41	08:45 (WEA06)	17:03	19	16:28 (WEA10)	16:13	84	14:45 (WEA03)	16:09	139	15:18 (WEA02)
28	05:31		06:24		07:19		08:04 (WEA06)	07:14		09:13 (WEA05)	08:12		09:04 (WEA05)	08:41		09:22 (WEA05)
	21:29		20:26		19:10	41	08:45 (WEA06)	17:01	22	09:35 (WEA05)	16:12	103	14:56 (WEA02)	16:10	139	15:18 (WEA02)
29	05:33		06:26		07:21		08:03 (WEA06)	07:16		09:11 (WEA05)	08:14		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:28		20:24		19:08	43	08:46 (WEA06)	16:59	27	09:38 (WEA05)	16:11	112	14:58 (WEA02)	16:11	139	15:18 (WEA02)
30	05:34		06:28		07:22		08:03 (WEA06)	07:18		09:08 (WEA05)	08:15		09:05 (WEA05)	08:41		09:23 (WEA05)
	21:26		20:21		19:06	43	08:46 (WEA06)	16:57	32	09:40 (WEA05)	16:10	118	14:59 (WEA02)	16:12	139	15:19 (WEA02)
31	05:36		06:30					07:20		09:07 (WEA05)				08:41		09:23 (WEA05)
	21:24		20:19					16:55	35	09:42 (WEA05)				16:13	138	15:19 (WEA02)
Sonnenscheinstunden	511		459		382			329			260			234		
astr.max.mögl.Beschattung						459			659			2174			4236	
Red.Sonnenscheinwahrsch.						0,35			0,29			0,19			0,14	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,62			0,62			0,62			0,64	
Gesamte Reduktion						0,20			0,17			0,12			0,09	
Met.wahrsch.Beschattung						94			114			250			364	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:42		09:50 (WEA02)	08:12		08:39 (WEA03)	07:15	07:00		05:51		05:02
	16:14	26	10:16 (WEA02)	17:05	49	10:14 (WEA10)	18:00	19:58		20:53		21:43
2	08:41		09:51 (WEA02)	08:10		08:39 (WEA03)	07:12	06:58		05:49		05:01
	16:15	25	10:16 (WEA02)	17:07	49	10:13 (WEA10)	18:02	20:00		20:55		21:44
3	08:41		09:52 (WEA02)	08:08		08:40 (WEA03)	07:10	06:55		05:47		05:00
	16:16	25	10:17 (WEA02)	17:09	46	10:13 (WEA10)	18:04	20:02		20:57		21:45
4	08:41		09:52 (WEA02)	08:06		08:40 (WEA03)	07:08	06:53		05:45		04:59
	16:18	25	10:17 (WEA02)	17:11	43	10:11 (WEA10)	18:06	20:04		20:59		21:46
5	08:41		09:53 (WEA02)	08:05		08:40 (WEA03)	07:05	06:50		05:43		04:59
	16:19	24	10:17 (WEA02)	17:13	38	10:09 (WEA10)	18:08	20:06		21:00		21:47
6	08:40		09:54 (WEA02)	08:03		08:40 (WEA03)	07:03	06:48		05:41		04:58
	16:20	23	10:17 (WEA02)	17:15	30	09:10 (WEA03)	18:10	20:08		21:02		21:48
7	08:40		09:54 (WEA02)	08:01		08:40 (WEA03)	07:01	06:45		05:39		04:57
	16:21	22	10:16 (WEA02)	17:17	30	09:10 (WEA03)	18:12	20:09		21:04		21:49
8	08:39		09:56 (WEA02)	07:59		08:41 (WEA03)	06:58	06:43		05:37		04:57
	16:23	21	10:17 (WEA02)	17:19	28	09:09 (WEA03)	18:14	20:11		21:06		21:50
9	08:39		09:57 (WEA02)	07:57		08:41 (WEA03)	06:56	06:41		05:35		04:56
	16:24	19	10:16 (WEA02)	17:21	28	09:09 (WEA03)	18:16	20:13		21:07		21:51
10	08:38		09:58 (WEA02)	07:55		08:42 (WEA11)	06:53	06:38		05:34		04:56
	16:26	17	10:15 (WEA02)	17:23	26	09:08 (WEA03)	18:18	20:15		21:09		21:52
11	08:37		10:00 (WEA02)	07:53		08:41 (WEA11)	06:51	06:36		05:32		04:55
	16:27	15	10:15 (WEA02)	17:25	27	09:08 (WEA03)	18:19	20:17		21:11		21:53
12	08:37		10:01 (WEA02)	07:51		08:40 (WEA11)	06:49	06:34		05:30		04:55
	16:29	12	10:13 (WEA13)	17:27	26	09:06 (WEA03)	18:21	20:19		21:13		21:54
13	08:36		10:04 (WEA02)	07:49		08:40 (WEA11)	06:46	06:31		05:28		04:55
	16:30	9	10:13 (WEA13)	17:29	24	09:04 (WEA03)	18:23	20:20		21:14		21:54
14	08:35		09:56 (WEA10)	07:47		08:40 (WEA11)	06:44	06:29		05:27		04:54
	16:32	9	10:11 (WEA13)	17:31	22	09:02 (WEA03)	18:25	20:22		21:16		21:55
15	08:34		09:54 (WEA10)	07:45		08:40 (WEA11)	06:41	06:27		05:25		04:54
	16:34	11	10:05 (WEA10)	17:33	19	08:59 (WEA03)	18:27	20:24		21:18		21:56
16	08:33		09:53 (WEA10)	07:43		08:40 (WEA11)	06:39	06:24		05:23		04:54
	16:35	14	10:07 (WEA10)	17:35	15	08:55 (WEA11)	18:29	20:26		21:19		21:56
17	08:32		09:53 (WEA10)	07:41		08:41 (WEA11)	06:37	06:22		05:22		04:54
	16:37	15	10:08 (WEA10)	17:37	14	08:55 (WEA11)	18:31	20:28		21:21		21:57
18	08:31		09:52 (WEA10)	07:39		08:41 (WEA11)	06:34	06:20		05:20		04:54
	16:39	17	10:09 (WEA10)	17:39	12	08:53 (WEA11)	18:33	20:30		21:23		21:57
19	08:30		09:51 (WEA10)	07:37		08:44 (WEA11)	06:32	06:17		05:18		04:54
	16:40	19	10:10 (WEA10)	17:41	7	08:51 (WEA11)	18:34	20:31		21:24		21:57
20	08:29		09:51 (WEA10)	07:35			06:29	06:15		05:17		04:54
	16:42	21	10:12 (WEA10)	17:43			18:36	20:33		21:26		21:58
21	08:28		09:51 (WEA10)	07:33			06:27	06:13		05:15		04:54
	16:44	21	10:12 (WEA10)	17:45			18:38	20:35		21:27		21:58
22	08:26		09:51 (WEA10)	07:30			06:24	06:11		05:14		04:54
	16:46	22	10:13 (WEA10)	17:47			18:40	20:37		21:29		21:58
23	08:25		08:54 (WEA03)	07:28			06:22	06:08		05:13		04:54
	16:48	27	10:13 (WEA10)	17:49			18:42	20:39		21:30		21:58
24	08:24		08:53 (WEA03)	07:26			06:19	06:06		05:11		04:55
	16:50	30	10:14 (WEA10)	17:51			18:44	20:41		21:32		21:59
25	08:22		08:51 (WEA03)	07:24			06:17	06:04		05:10		04:55
	16:51	35	10:14 (WEA10)	17:53			18:45	20:42		21:33		21:59
26	08:21		08:50 (WEA03)	07:21			06:15	06:02		05:09		04:55
	16:53	38	10:15 (WEA10)	17:54			18:47	20:44		21:35		21:59
27	08:20		08:48 (WEA03)	07:19			06:12	06:00		05:07		04:56
	16:55	41	10:15 (WEA10)	17:56			18:49	20:46		21:36		21:58
28	08:18		08:46 (WEA03)	07:17			06:10	05:57		05:06		04:56
	16:57	43	10:15 (WEA10)	17:58			18:51	20:48		21:38		21:58
29	08:16		08:45 (WEA03)				07:07	05:55		05:05		04:57
	16:59	46	10:16 (WEA10)				19:53	20:50		21:39		21:58
30	08:15		08:43 (WEA03)				07:05	05:53		05:04		04:58
	17:01	47	10:15 (WEA10)				19:55	20:51		21:40		21:58
31	08:13		08:41 (WEA03)				07:02			05:03		
	17:03	49	10:15 (WEA10)				19:56			21:42		
Sonnenscheinstunden	251			274			367	420		493		509
astr.max.mögl.Beschattung		768			533							
Red.Sonnenscheinwahrsch.		0,17			0,24							
Reduktion Betriebsdauer		0,95			0,95							
Reduktion Windrichtung		0,61			0,61							
Gesamte Reduktion		0,10			0,14							
Met.wahrsch.Beschattung		76			74							

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP09 - Sticht 5, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober			November			Dezember		
1	04:58		05:38		06:32		07:24			07:22		08:11 (WEA11)	08:17		09:42 (WEA02)
	21:58		21:23		20:17		19:03			16:53	26	08:37 (WEA03)	16:09	15	09:57 (WEA02)
2	04:59		05:39		06:33		07:26			07:24		08:11 (WEA03)	08:18		09:41 (WEA02)
	21:57		21:21		20:14		19:01			16:51	28	08:39 (WEA03)	16:08	17	09:58 (WEA02)
3	05:00		05:41		06:35		07:28			07:26		08:10 (WEA03)	08:20		09:40 (WEA02)
	21:57		21:19		20:12		18:58			16:49	29	08:39 (WEA03)	16:08	19	09:59 (WEA02)
4	05:01		05:43		06:37		07:30			07:28		08:10 (WEA03)	08:21		09:40 (WEA02)
	21:56		21:17		20:09		18:56			16:47	29	08:39 (WEA03)	16:07	21	10:01 (WEA02)
5	05:01		05:44		06:39		07:32			07:30		08:10 (WEA03)	08:23		09:40 (WEA02)
	21:56		21:15		20:07		18:54			16:45	30	08:40 (WEA03)	16:06	22	10:02 (WEA02)
6	05:02		05:46		06:40		07:33			07:32		08:10 (WEA03)	08:24		09:40 (WEA02)
	21:55		21:13		20:05		18:51			16:44	39	09:39 (WEA10)	16:06	23	10:03 (WEA02)
7	05:03		05:48		06:42		07:35			07:34		08:10 (WEA03)	08:25		09:39 (WEA02)
	21:54		21:11		20:02		18:49			16:42	43	09:41 (WEA10)	16:05	24	10:03 (WEA02)
8	05:04		05:50		06:44		07:37			07:36		08:10 (WEA03)	08:27		09:40 (WEA02)
	21:54		21:10		20:00		18:46			16:40	47	09:43 (WEA10)	16:05	25	10:05 (WEA02)
9	05:05		05:51		06:46		07:39			07:38		08:10 (WEA03)	08:28		09:40 (WEA02)
	21:53		21:08		19:57		18:44			16:38	48	09:44 (WEA10)	16:05	25	10:05 (WEA02)
10	05:06		05:53		06:47		07:41			07:40		08:10 (WEA03)	08:29		09:40 (WEA02)
	21:52		21:06		19:55		18:42			16:36	50	09:45 (WEA10)	16:04	26	10:06 (WEA02)
11	05:08		05:55		06:49		07:43			07:41		08:12 (WEA03)	08:30		09:41 (WEA02)
	21:51		21:04		19:52		18:39			16:35	49	09:46 (WEA10)	16:04	26	10:07 (WEA02)
12	05:09		05:56		06:51		07:44			07:43		08:15 (WEA03)	08:31		09:41 (WEA02)
	21:50		21:01		19:50		18:37			16:33	47	09:47 (WEA10)	16:04	27	10:08 (WEA02)
13	05:10		05:58		06:53		07:46			07:45		08:17 (WEA03)	08:32		09:41 (WEA02)
	21:49		20:59		19:47		18:35			16:31	46	09:48 (WEA10)	16:04	27	10:08 (WEA02)
14	05:11		06:00		06:54		07:48			07:47		08:19 (WEA03)	08:33		09:41 (WEA02)
	21:48		20:57		19:45		18:32			16:30	43	09:48 (WEA10)	16:04	28	10:09 (WEA02)
15	05:12		06:02		06:56		07:50			07:49		08:21 (WEA03)	08:34		09:42 (WEA02)
	21:47		20:55		19:43		18:30			16:28	40	09:48 (WEA10)	16:04	27	10:09 (WEA02)
16	05:14		06:03		06:58		07:52			07:51		08:23 (WEA03)	08:35		09:42 (WEA02)
	21:46		20:53		19:40		18:28			16:27	38	09:48 (WEA10)	16:04	28	10:10 (WEA02)
17	05:15		06:05		07:00		07:54			07:53		08:25 (WEA03)	08:36		09:42 (WEA02)
	21:45		20:51		19:38		18:25			16:25	35	09:48 (WEA10)	16:04	28	10:10 (WEA02)
18	05:16		06:07		07:01		07:56			07:55		08:27 (WEA03)	08:37		09:42 (WEA02)
	21:44		20:49		19:35		18:23			16:24	30	09:48 (WEA10)	16:04	29	10:11 (WEA02)
19	05:18		06:09		07:03		07:57			07:56		08:29 (WEA03)	08:38		09:43 (WEA02)
	21:43		20:46		19:33		18:21			16:22	27	09:48 (WEA10)	16:05	28	10:11 (WEA02)
20	05:19		06:10		07:05		07:59			07:58		09:26 (WEA10)	08:38		09:44 (WEA02)
	21:41		20:44		19:30		18:19			16:21	22	09:48 (WEA10)	16:05	28	10:12 (WEA02)
21	05:21		06:12		07:07		08:01			08:00		09:27 (WEA10)	08:39		09:44 (WEA02)
	21:40		20:42		19:28		18:16			16:20	21	09:48 (WEA10)	16:05	28	10:12 (WEA02)
22	05:22		06:14		07:08		08:03			08:02		09:27 (WEA10)	08:39		09:45 (WEA02)
	21:39		20:40		19:25		18:14			16:18	21	09:48 (WEA10)	16:06	28	10:13 (WEA02)
23	05:23		06:16		07:10		08:05		09:13 (WEA11)	08:04		09:28 (WEA10)	08:40		09:45 (WEA02)
	21:37		20:38		19:23		18:12	9	09:22 (WEA11)	16:17	19	09:47 (WEA10)	16:06	28	10:13 (WEA02)
24	05:25		06:17		07:12		08:07		09:12 (WEA11)	08:05		09:30 (WEA10)	08:40		09:45 (WEA02)
	21:36		20:35		19:20		18:10	12	09:24 (WEA11)	16:16	17	09:47 (WEA10)	16:07	28	10:13 (WEA02)
25	05:27		06:19		07:14		07:09		08:10 (WEA11)	08:07		09:31 (WEA10)	08:41		09:46 (WEA02)
	21:34		20:33		19:18		17:08	14	08:24 (WEA11)	16:15	16	09:47 (WEA10)	16:08	28	10:14 (WEA02)
26	05:28		06:21		07:15		07:11		08:10 (WEA11)	08:09		09:31 (WEA10)	08:41		09:46 (WEA02)
	21:33		20:31		19:15		17:05	15	08:25 (WEA11)	16:14	14	09:45 (WEA10)	16:08	29	10:15 (WEA02)
27	05:30		06:23		07:17		07:13		08:09 (WEA11)	08:10		09:33 (WEA10)	08:41		09:47 (WEA02)
	21:31		20:28		19:13		17:03	21	08:30 (WEA03)	16:13	11	09:44 (WEA10)	16:09	28	10:15 (WEA02)
28	05:31		06:25		07:19		07:14		08:09 (WEA11)	08:12		09:36 (WEA10)	08:41		09:47 (WEA02)
	21:29		20:26		19:11		17:01	23	08:32 (WEA03)	16:12	10	09:51 (WEA13)	16:10	28	10:15 (WEA02)
29	05:33		06:26		07:21		07:16		08:09 (WEA11)	08:14		09:45 (WEA02)	08:42		09:48 (WEA02)
	21:28		20:24		19:08		16:59	25	08:34 (WEA03)	16:11	9	09:54 (WEA13)	16:11	28	10:16 (WEA02)
30	05:34		06:28		07:23		07:18		08:09 (WEA11)	08:15		09:44 (WEA02)	08:42		09:49 (WEA02)
	21:26		20:21		19:06		16:57	26	08:35 (WEA03)	16:10	11	09:55 (WEA13)	16:12	27	10:16 (WEA02)
31	05:36		06:30				07:20		08:10 (WEA11)				08:42		09:49 (WEA02)
	21:24		20:19				16:55	26	08:36 (WEA03)				16:13	27	10:16 (WEA02)
Sonnenscheinstunden	511		459		382		329			260			234		
astr.max.mögl.Beschattung								171			895			800	
Red.Sonnenscheinwahrsch.								0,29			0,19			0,14	
Reduktion Betriebsdauer								0,95			0,95			0,95	
Reduktion Windrichtung								0,61			0,61			0,61	
Gesamte Reduktion								0,17			0,11			0,08	
Met.wahrsch.Beschattung								29			101			65	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP10 - Falkenhorst 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:42	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:54	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:51	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:36
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:17	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:42	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:38
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:39	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:15	07:10	08:05	08:03	08:40
	16:48	17:48	18:41	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:08	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP11 - Auf dem Kampen 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni
1	08:41		08:11		07:14		17:25 (WEA05)	07:00	18:49 (WEA06)	05:51	18:51 (WEA06) 05:02
	16:14		17:05		18:00	8	17:33 (WEA05)	19:58 40	19:29 (WEA06)	20:53 26	19:17 (WEA06) 21:43
2	08:41		08:10		07:12		17:22 (WEA05)	06:57	18:48 (WEA06)	05:49	18:53 (WEA06) 05:01
	16:15		17:07		18:02	12	17:34 (WEA05)	20:00 42	19:30 (WEA06)	20:55 21	19:14 (WEA06) 21:44
3	08:41		08:08		07:10		17:20 (WEA05)	06:55	18:46 (WEA06)	05:47	18:56 (WEA06) 05:00
	16:16		17:09		18:04	17	17:37 (WEA05)	20:02 45	19:31 (WEA06)	20:57 14	19:10 (WEA06) 21:45
4	08:41		08:06	16:38 (WEA09)	07:07		17:19 (WEA05)	06:52	18:45 (WEA06)	05:45	04:59
	16:17		17:11	1 16:39 (WEA09)	18:06	20	17:39 (WEA05)	20:04 47	19:32 (WEA06)	20:58	21:46
5	08:40		08:04	16:38 (WEA09)	07:05		17:17 (WEA05)	06:50	18:44 (WEA06)	05:43	04:59
	16:19		17:13	4 16:42 (WEA09)	18:08	24	17:41 (WEA05)	20:05 49	19:33 (WEA06)	21:00	21:47
6	08:40		08:03	16:37 (WEA09)	07:03		17:17 (WEA05)	06:48	18:43 (WEA06)	05:41	04:58
	16:20		17:15	7 16:44 (WEA09)	18:10	26	17:43 (WEA05)	20:07 50	19:33 (WEA06)	21:02	21:48
7	08:40		08:01	16:36 (WEA09)	07:00		17:15 (WEA05)	06:45	18:42 (WEA06)	05:39	04:57
	16:21		17:17	11 16:47 (WEA09)	18:12	29	17:44 (WEA05)	20:09 51	19:33 (WEA06)	21:04	21:49
8	08:39		07:59	16:35 (WEA09)	06:58		17:15 (WEA05)	06:43	18:42 (WEA06)	05:37	04:57
	16:23		17:19	14 16:49 (WEA09)	18:14	32	17:47 (WEA05)	20:11 52	19:34 (WEA06)	21:06	21:50
9	08:38		07:57	16:35 (WEA09)	06:56		17:15 (WEA05)	06:40	18:40 (WEA06)	05:35	04:56
	16:24		17:21	16 16:51 (WEA09)	18:15	33	17:48 (WEA05)	20:13 53	19:33 (WEA06)	21:07	21:51
10	08:38		07:55	16:33 (WEA09)	06:53		17:14 (WEA05)	06:38	18:40 (WEA06)	05:33	04:55
	16:26		17:23	19 16:52 (WEA09)	18:17	34	17:48 (WEA05)	20:15 54	19:34 (WEA06)	21:09	21:52
11	08:37		07:53	16:33 (WEA09)	06:51		17:14 (WEA05)	06:36	18:39 (WEA06)	05:32	04:55
	16:27		17:25	22 16:55 (WEA09)	18:19	34	17:48 (WEA05)	20:16 54	19:33 (WEA06)	21:11	21:53
12	08:36		07:51	16:33 (WEA09)	06:48		17:14 (WEA05)	06:33	18:39 (WEA06)	05:30	04:55
	16:29		17:27	24 16:57 (WEA09)	18:21	33	17:47 (WEA05)	20:18 54	19:33 (WEA06)	21:12	21:53
13	08:36		07:49	16:34 (WEA09)	06:46		17:14 (WEA05)	06:31	18:39 (WEA06)	05:28	04:54
	16:30		17:29	25 16:59 (WEA09)	18:23	33	17:47 (WEA05)	20:20 54	19:33 (WEA06)	21:14	21:54
14	08:35		07:47	16:34 (WEA09)	06:44		17:14 (WEA05)	06:29	18:39 (WEA06)	05:26	04:54
	16:32		17:31	25 16:59 (WEA09)	18:25	31	17:45 (WEA05)	20:22 54	19:33 (WEA06)	21:16	21:55
15	08:34		07:45	16:34 (WEA09)	06:41		17:15 (WEA05)	06:26	18:38 (WEA06)	05:25	04:54
	16:33		17:33	25 16:59 (WEA09)	18:27	30	17:45 (WEA05)	20:24 54	19:32 (WEA06)	21:18	21:55
16	08:33		07:43	16:35 (WEA09)	06:39		17:15 (WEA05)	06:24	18:38 (WEA06)	05:23	04:54
	16:35		17:35	24 16:59 (WEA09)	18:29	28	17:43 (WEA05)	20:26 54	19:32 (WEA06)	21:19	21:56
17	08:32		07:41	16:35 (WEA09)	06:36		17:16 (WEA05)	06:22	18:38 (WEA06)	05:21	04:54
	16:37		17:37	22 16:57 (WEA09)	18:30	26	17:42 (WEA05)	20:27 54	19:32 (WEA06)	21:21	21:56
18	08:31		07:39	16:36 (WEA09)	06:34		17:17 (WEA05)	06:19	18:39 (WEA06)	05:20	04:54
	16:39		17:39	20 16:56 (WEA09)	18:32	23	17:40 (WEA05)	20:29 53	19:32 (WEA06)	21:22	21:57
19	08:30		07:37	16:38 (WEA09)	06:31		17:19 (WEA05)	06:17	18:38 (WEA06)	05:18	04:54
	16:40		17:41	17 16:55 (WEA09)	18:34	19	17:38 (WEA05)	20:31 52	19:30 (WEA06)	21:24	21:57
20	08:29		07:35	16:40 (WEA09)	06:29		17:22 (WEA05)	06:15	18:39 (WEA06)	05:17	04:54
	16:42		17:43	14 16:54 (WEA09)	18:36	14	17:36 (WEA05)	20:33 51	19:30 (WEA06)	21:26	21:58
21	08:27		07:32	16:43 (WEA09)	06:27			06:13	18:39 (WEA06)	05:15	04:54
	16:44		17:45	6 16:49 (WEA09)	18:38			20:35 50	19:29 (WEA06)	21:27	21:58
22	08:26		07:30		06:24			06:10	18:40 (WEA06)	05:14	04:54
	16:46		17:46		18:40			20:37 49	19:29 (WEA06)	21:29	21:58
23	08:25		07:28		06:22			06:08	18:40 (WEA06)	05:12	04:54
	16:48		17:48		18:42			20:38 48	19:28 (WEA06)	21:30	21:58
24	08:24		07:26		06:19			06:06	18:41 (WEA06)	05:11	04:54
	16:49		17:50		18:43			20:40 46	19:27 (WEA06)	21:32	21:58
25	08:22		07:23		06:17			06:04	18:42 (WEA06)	05:10	04:55
	16:51		17:52		18:45			20:42 44	19:26 (WEA06)	21:33	21:58
26	08:21		07:21		06:14			06:02	18:43 (WEA06)	05:09	04:55
	16:53		17:54		18:47			20:44 42	19:25 (WEA06)	21:35	21:58
27	08:19		07:19		06:12		18:05 (WEA06)	05:59	18:43 (WEA06)	05:07	04:56
	16:55		17:56		18:49	11	18:16 (WEA06)	20:46 40	19:23 (WEA06)	21:36	21:58
28	08:18		07:17	17:28 (WEA05)	06:09		18:00 (WEA06)	05:57	18:45 (WEA06)	05:06	04:56
	16:57		17:58	3 17:31 (WEA05)	18:51	21	18:21 (WEA06)	20:48 36	19:21 (WEA06)	21:37	21:58
29	08:16				07:07		18:57 (WEA06)	05:55	18:46 (WEA06)	05:05	04:57
	16:59				19:53	28	19:25 (WEA06)	20:49 34	19:20 (WEA06)	21:39	21:58
30	08:15				07:05		18:54 (WEA06)	05:53	18:48 (WEA06)	05:04	04:57
	17:01				19:54	32	19:26 (WEA06)	20:51 30	19:18 (WEA06)	21:40	21:58
31	08:13				07:02		18:52 (WEA06)			05:03	
	17:03				19:56	36	19:28 (WEA06)			21:41	
Sonnenscheinstunden	251		274		367			420		493	509
astr.max.mögl.Beschattung		299				634		1436		61	
Red.Sonnenscheinwahrsch.		0,24				0,28		0,37		0,43	
Reduktion Betriebsdauer		0,95				0,95		0,95		0,95	
Reduktion Windrichtung		0,68				0,65		0,65		0,65	
Gesamte Reduktion		0,15				0,17		0,23		0,27	
Met.wahrsch.Beschattung		46				109		332		16	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP11 - Auf dem Kampen 2, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November		Dezember	
1	04:58	05:38			06:31		18:39 (WEA06)	07:24	17:53 (WEA05)	07:22	16:03 (WEA09)	08:17
	21:57	21:22			20:16	54	19:33 (WEA06)	19:03	33	18:26 (WEA05)	16:53	19	16:22 (WEA09)	16:09
2	04:59	05:39			06:33		18:38 (WEA06)	07:26	17:52 (WEA05)	07:24	16:03 (WEA09)	08:18
	21:57	21:21			20:14	54	19:32 (WEA06)	19:01	34	18:26 (WEA05)	16:51	16	16:19 (WEA09)	16:08
3	05:00	05:41			06:35		18:38 (WEA06)	07:28	17:52 (WEA05)	07:26	16:04 (WEA09)	08:20
	21:57	21:19			20:12	53	19:31 (WEA06)	18:58	34	18:26 (WEA05)	16:49	13	16:17 (WEA09)	16:08
4	05:00	05:43			06:37		18:39 (WEA06)	07:30	17:52 (WEA05)	07:28	16:06 (WEA09)	08:21
	21:56	21:17			20:09	52	19:31 (WEA06)	18:56	33	18:25 (WEA05)	16:47	10	16:16 (WEA09)	16:07
5	05:01	05:44			06:38		18:38 (WEA06)	07:31	17:52 (WEA05)	07:30	16:06 (WEA09)	08:22
	21:56	21:15			20:07	51	19:29 (WEA06)	18:53	33	18:25 (WEA05)	16:45	8	16:14 (WEA09)	16:06
6	05:02	05:46			06:40		18:39 (WEA06)	07:33	17:52 (WEA05)	07:32	16:08 (WEA09)	08:24
	21:55	21:13			20:04	50	19:29 (WEA06)	18:51	31	18:23 (WEA05)	16:43	4	16:12 (WEA09)	16:06
7	05:03	05:48			06:42		18:39 (WEA06)	07:35	17:52 (WEA05)	07:34	16:09 (WEA09)	08:25
	21:54	21:11			20:02	49	19:28 (WEA06)	18:49	28	18:20 (WEA05)	16:41	1	16:10 (WEA09)	16:05
8	05:04	05:49			06:44		18:39 (WEA06)	07:37	17:52 (WEA05)	07:35				08:26
	21:54	21:09			20:00	47	19:26 (WEA06)	18:46	25	18:17 (WEA05)	16:40			16:05
9	05:05	05:51		19:11 (WEA06)	06:45		18:40 (WEA06)	07:39	17:53 (WEA05)	07:37				08:28
	21:53	21:07	3	19:14 (WEA06)	19:57	45	19:25 (WEA06)	18:44	22	18:15 (WEA05)	16:38			16:05
10	05:06	05:53		19:04 (WEA06)	06:47		18:41 (WEA06)	07:40	17:54 (WEA05)	07:39				08:29
	21:52	21:05	16	19:20 (WEA06)	19:55	43	19:24 (WEA06)	18:41	18	18:12 (WEA05)	16:36			16:04
11	05:07	05:55		19:01 (WEA06)	06:49		18:42 (WEA06)	07:42	17:55 (WEA05)	07:41				08:30
	21:51	21:03	22	19:23 (WEA06)	19:52	39	19:21 (WEA06)	18:39	15	18:10 (WEA05)	16:34			16:04
12	05:08	05:56		18:57 (WEA06)	06:51		18:43 (WEA06)	07:44	17:57 (WEA05)	07:43				08:31
	21:50	21:01	28	19:25 (WEA06)	19:50	37	19:20 (WEA06)	18:37	11	18:08 (WEA05)	16:33			16:04
13	05:10	05:58		18:56 (WEA06)	06:52		18:45 (WEA06)	07:46	17:59 (WEA05)	07:45				08:32
	21:49	20:59	31	19:27 (WEA06)	19:47	33	19:18 (WEA06)	18:34	6	18:05 (WEA05)	16:31			16:04
14	05:11	06:00		18:54 (WEA06)	06:54		18:47 (WEA06)	07:48			07:47			08:33
	21:48	20:57	35	19:29 (WEA06)	19:45	28	19:15 (WEA06)	18:32			16:30			16:04
15	05:12	06:01		18:52 (WEA06)	06:56		18:49 (WEA06)	07:50			07:49			08:34
	21:47	20:55	37	19:29 (WEA06)	19:42	22	19:11 (WEA06)	18:30			16:28			16:04
16	05:13	06:03		18:51 (WEA06)	06:58		18:53 (WEA06)	07:52			07:51			08:35
	21:46	20:53	39	19:30 (WEA06)	19:40	14	19:07 (WEA06)	18:27			16:26			16:04
17	05:15	06:05		18:50 (WEA06)	06:59			07:53			07:52			08:36
	21:45	20:51	42	19:32 (WEA06)	19:37			18:25			16:25			16:04
18	05:16	06:07		18:48 (WEA06)	07:01			07:55			07:54			08:37
	21:44	20:48	44	19:32 (WEA06)	19:35			18:23			16:24			16:04
19	05:18	06:08		18:47 (WEA06)	07:03			07:57			07:56			08:37
	21:42	20:46	46	19:33 (WEA06)	19:33			18:21			16:22			16:04
20	05:19	06:10		18:46 (WEA06)	07:05			07:59			07:58			08:38
	21:41	20:44	48	19:34 (WEA06)	19:30			18:18			16:21			16:05
21	05:20	06:12		18:44 (WEA06)	07:06			08:01	17:13 (WEA09)	08:00				08:39
	21:40	20:42	49	19:33 (WEA06)	19:28			18:16	9	17:22 (WEA09)	16:19			16:05
22	05:22	06:14		18:44 (WEA06)	07:08			08:03	17:10 (WEA09)	08:02				08:39
	21:38	20:40	50	19:34 (WEA06)	19:25			18:14	15	17:25 (WEA09)	16:18			16:06
23	05:23	06:16		18:43 (WEA06)	07:10		18:07 (WEA05)	08:05		17:08 (WEA09)	08:03			08:40
	21:37	20:37	52	19:35 (WEA06)	19:23	11	18:18 (WEA05)	18:12	18	17:26 (WEA09)	16:17			16:06
24	05:25	06:17		18:42 (WEA06)	07:12		18:03 (WEA05)	08:07		17:06 (WEA09)	08:05			08:40
	21:36	20:35	52	19:34 (WEA06)	19:20	18	18:21 (WEA05)	18:10	21	17:27 (WEA09)	16:16			16:07
25	05:26	06:19		18:41 (WEA06)	07:13		18:01 (WEA05)	07:09		16:05 (WEA09)	08:07			08:40
	21:34	20:33	54	19:35 (WEA06)	19:18	22	18:23 (WEA05)	17:07	23	16:28 (WEA09)	16:15			16:07
26	05:28	06:21		18:41 (WEA06)	07:15		17:58 (WEA05)	07:10		16:04 (WEA09)	08:08			08:41
	21:32	20:30	54	19:35 (WEA06)	19:15	25	18:23 (WEA05)	17:05	24	16:28 (WEA09)	16:14			16:08
27	05:29	06:23		18:40 (WEA06)	07:17		17:57 (WEA05)	07:12		16:04 (WEA09)	08:10			08:41
	21:31	20:28	54	19:34 (WEA06)	19:13	28	18:25 (WEA05)	17:03	25	16:29 (WEA09)	16:13			16:09
28	05:31	06:24		18:40 (WEA06)	07:19		17:56 (WEA05)	07:14		16:03 (WEA09)	08:12			08:41
	21:29	20:26	54	19:34 (WEA06)	19:10	29	18:25 (WEA05)	17:01	26	16:29 (WEA09)	16:12			16:10
29	05:33	06:26		18:40 (WEA06)	07:21		17:55 (WEA05)	07:16		16:03 (WEA09)	08:13			08:41
	21:28	20:23	54	19:34 (WEA06)	19:08	31	18:26 (WEA05)	16:59	25	16:28 (WEA09)	16:11			16:11
30	05:34	06:28		18:39 (WEA06)	07:22		17:54 (WEA05)	07:18		16:03 (WEA09)	08:15			08:41
	21:26	20:21	54	19:33 (WEA06)	19:05	32	18:26 (WEA05)	16:57	23	16:26 (WEA09)	16:10			16:12
31	05:36	06:30		18:39 (WEA06)				07:20		16:03 (WEA09)				08:41
	21:24	20:19	54	19:33 (WEA06)				16:55	21	16:24 (WEA09)				16:13
Sonnenscheinstunden	511	459			382			329			260			234
astr.max.mögl.Beschattung			972			867			553			71		
Red.Sonnenscheinwahrsch.			0,42			0,35			0,29			0,19		
Reduktion Betriebsdauer			0,95			0,95			0,95			0,95		
Reduktion Windrichtung			0,65			0,65			0,66			0,68		
Gesamte Reduktion			0,26			0,22			0,18			0,13		
Met.wahrsch.Beschattung			255			187			102			9		

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP12 - Auf dem Kampen 6, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar			März			April			Mai			Juni		
1	08:41		08:11			07:14			07:00			05:51		18:58 (WEA06)	05:02		19:21 (WEA06)
	16:14		17:05			18:00			19:58			20:53	61	19:59 (WEA06)	21:43	17	19:38 (WEA06)
2	08:41		08:10			07:12		17:31 (WEA04)	06:57			05:49		18:58 (WEA06)	05:01		19:24 (WEA06)
	16:15		17:07			18:02	3	17:34 (WEA04)	20:00			20:55	61	19:59 (WEA06)	21:44	13	19:37 (WEA06)
3	08:41		08:08			07:10		17:30 (WEA04)	06:55			05:47		18:58 (WEA06)	05:00		19:28 (WEA06)
	16:16		17:09			18:04	7	17:37 (WEA04)	20:02			20:57	60	19:58 (WEA06)	21:45	5	19:33 (WEA06)
4	08:41		08:06			07:07		17:29 (WEA04)	06:52			05:45		18:58 (WEA06)	04:59		
	16:17		17:11			18:06	10	17:39 (WEA04)	20:04			20:58	60	19:58 (WEA06)	21:46		
5	08:40		08:04			07:05		17:27 (WEA04)	06:50			05:43		18:58 (WEA06)	04:59		
	16:19		17:13			18:08	14	17:41 (WEA04)	20:05			21:00	60	19:58 (WEA06)	21:47		
6	08:40		08:03			07:03		17:27 (WEA04)	06:48			05:41		18:58 (WEA06)	04:58		
	16:20		17:15			18:10	16	17:43 (WEA04)	20:07			21:02	59	19:57 (WEA06)	21:48		
7	08:40		08:01		16:46 (WEA09)	07:00		17:26 (WEA04)	06:45			05:39		18:58 (WEA06)	04:57		
	16:21		17:17	1	16:47 (WEA09)	18:12	18	17:44 (WEA04)	20:09			21:04	59	19:57 (WEA06)	21:49		
8	08:39		07:59		16:44 (WEA09)	06:58		17:26 (WEA04)	06:43			05:37		18:59 (WEA06)	04:57		
	16:23		17:19	5	16:49 (WEA09)	18:14	21	17:47 (WEA04)	20:11			21:06	58	19:57 (WEA06)	21:50		
9	08:38		07:57		16:43 (WEA09)	06:56		17:26 (WEA04)	06:40			05:35		18:59 (WEA06)	04:56		
	16:24		17:21	8	16:51 (WEA09)	18:15	23	17:49 (WEA04)	20:13			21:07	58	19:57 (WEA06)	21:51		
10	08:38		07:55		16:41 (WEA09)	06:53		17:26 (WEA04)	06:38		19:26 (WEA06)	05:33		18:59 (WEA06)	04:55		
	16:26		17:23	11	16:52 (WEA09)	18:17	25	17:51 (WEA05)	20:15	14	19:40 (WEA06)	21:09	57	19:56 (WEA06)	21:52		
11	08:37		07:53		16:40 (WEA09)	06:51		17:27 (WEA04)	06:36		19:20 (WEA06)	05:32		19:00 (WEA06)	04:55		
	16:27		17:25	15	16:55 (WEA09)	18:19	26	17:53 (WEA05)	20:16	23	19:43 (WEA06)	21:11	56	19:56 (WEA06)	21:53		
12	08:36		07:51		16:39 (WEA09)	06:48		17:26 (WEA05)	06:33		19:17 (WEA06)	05:30		19:00 (WEA06)	04:55		
	16:29		17:27	18	16:57 (WEA09)	18:21	28	17:54 (WEA05)	20:18	29	19:46 (WEA06)	21:12	55	19:55 (WEA06)	21:53		
13	08:36		07:49		16:39 (WEA09)	06:46		17:25 (WEA05)	06:31		19:15 (WEA06)	05:28		19:00 (WEA06)	04:54		
	16:30		17:29	20	16:59 (WEA09)	18:23	32	17:57 (WEA05)	20:20	34	19:49 (WEA06)	21:14	54	19:54 (WEA06)	21:54		
14	08:35		07:47		16:39 (WEA09)	06:44		17:24 (WEA05)	06:29		19:13 (WEA06)	05:26		19:01 (WEA06)	04:54		
	16:32		17:31	22	17:01 (WEA09)	18:25	34	17:58 (WEA05)	20:22	38	19:51 (WEA06)	21:16	53	19:54 (WEA06)	21:55		
15	08:34		07:45		16:39 (WEA09)	06:41		17:24 (WEA05)	06:26		19:10 (WEA06)	05:25		19:01 (WEA06)	04:54		
	16:33		17:33	25	17:04 (WEA09)	18:27	35	17:59 (WEA05)	20:24	42	19:52 (WEA06)	21:18	52	19:53 (WEA06)	21:55		
16	08:33		07:43		16:39 (WEA09)	06:39		17:23 (WEA05)	06:24		19:08 (WEA06)	05:23		19:03 (WEA06)	04:54		
	16:35		17:35	27	17:06 (WEA09)	18:29	36	17:59 (WEA05)	20:26	45	19:53 (WEA06)	21:19	50	19:53 (WEA06)	21:56		
17	08:32		07:41		16:38 (WEA09)	06:36		17:23 (WEA05)	06:22		19:07 (WEA06)	05:21		19:03 (WEA06)	04:54		
	16:37		17:37	28	17:06 (WEA09)	18:30	36	17:59 (WEA05)	20:27	47	19:54 (WEA06)	21:21	49	19:52 (WEA06)	21:56		
18	08:31		07:39		16:39 (WEA09)	06:34		17:22 (WEA05)	06:19		19:06 (WEA06)	05:20		19:04 (WEA06)	04:54		
	16:39		17:39	27	17:06 (WEA09)	18:32	36	17:58 (WEA05)	20:29	49	19:55 (WEA06)	21:22	48	19:52 (WEA06)	21:57		
19	08:30		07:37		16:39 (WEA09)	06:31		17:22 (WEA05)	06:17		19:04 (WEA06)	05:18		19:04 (WEA06)	04:54		
	16:40		17:41	27	17:06 (WEA09)	18:34	36	17:58 (WEA05)	20:31	51	19:55 (WEA06)	21:24	47	19:51 (WEA06)	21:57		
20	08:29		07:35		16:40 (WEA09)	06:29		17:23 (WEA05)	06:15		19:03 (WEA06)	05:17		19:05 (WEA06)	04:54		
	16:42		17:43	25	17:05 (WEA09)	18:36	35	17:58 (WEA05)	20:33	53	19:56 (WEA06)	21:26	45	19:50 (WEA06)	21:58		
21	08:27		07:32		16:40 (WEA09)	06:27		17:23 (WEA05)	06:13		19:02 (WEA06)	05:15		19:07 (WEA06)	04:54		
	16:44		17:45	24	17:04 (WEA09)	18:38	34	17:57 (WEA05)	20:35	55	19:57 (WEA06)	21:27	43	19:50 (WEA06)	21:58		
22	08:26		07:30		16:41 (WEA09)	06:24		17:23 (WEA05)	06:10		19:02 (WEA06)	05:14		19:08 (WEA06)	04:54		
	16:46		17:46	22	17:03 (WEA09)	18:40	33	17:56 (WEA05)	20:37	55	19:57 (WEA06)	21:29	41	19:49 (WEA06)	21:58		
23	08:25		07:28		16:43 (WEA09)	06:22		17:23 (WEA05)	06:08		19:01 (WEA06)	05:12		19:08 (WEA06)	04:54		
	16:48		17:48	19	17:02 (WEA09)	18:42	32	17:55 (WEA05)	20:38	57	19:58 (WEA06)	21:30	40	19:48 (WEA06)	21:58		
24	08:24		07:26		16:45 (WEA09)	06:19		17:25 (WEA05)	06:06		19:00 (WEA06)	05:11		19:09 (WEA06)	04:54		
	16:49		17:50	15	17:00 (WEA09)	18:43	29	17:54 (WEA05)	20:40	58	19:58 (WEA06)	21:32	38	19:47 (WEA06)	21:58		
25	08:22		07:23		16:47 (WEA09)	06:17		17:25 (WEA05)	06:04		19:00 (WEA06)	05:10		19:11 (WEA06)	04:55		
	16:51		17:52	9	16:56 (WEA09)	18:45	26	17:51 (WEA05)	20:42	59	19:59 (WEA06)	21:33	35	19:46 (WEA06)	21:58		
26	08:21		07:21			06:14		17:27 (WEA05)	06:02		18:59 (WEA06)	05:09		19:12 (WEA06)	04:55		
	16:53		17:54			18:47	23	17:50 (WEA05)	20:44	60	19:59 (WEA06)	21:35	34	19:46 (WEA06)	21:58		
27	08:19		07:19			06:12		17:28 (WEA05)	05:59		18:58 (WEA06)	05:07		19:13 (WEA06)	04:56		
	16:55		17:56			18:49	19	17:47 (WEA05)	20:46	60	19:58 (WEA06)	21:36	32	19:45 (WEA06)	21:58		
28	08:18		07:17			06:09		17:32 (WEA05)	05:57		18:58 (WEA06)	05:06		19:15 (WEA06)	04:56		
	16:57		17:58			18:51	12	17:44 (WEA05)	20:48	60	19:58 (WEA06)	21:37	29	19:44 (WEA06)	21:58		
29	08:16					07:07			05:55		18:57 (WEA06)	05:05		19:16 (WEA06)	04:57		
	16:59					19:53			20:49	61	19:58 (WEA06)	21:39	27	19:43 (WEA06)	21:58		
30	08:15					07:05			05:53		18:57 (WEA06)	05:04		19:18 (WEA06)	04:57		
	17:01					19:54			20:51	61	19:58 (WEA06)	21:40	23	19:41 (WEA06)	21:58		
31	08:13					07:02						05:03		19:19 (WEA06)			
	17:03					19:56						21:41	21	19:40 (WEA06)			
Sonnenscheinstunden	251		274			367			420			493			509		
astr.max.mögl.Beschattung				348			679			1011			1465			35	
Red.Sonnenscheinwahrsch.				0,24			0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95			0,95	
Reduktion Windrichtung				0,68			0,65			0,63			0,63			0,63	
Gesamte Reduktion				0,15			0,17			0,22			0,26			0,23	
Met.wahrsch.Beschattung				54			117			226			378			8	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP12 - Auf dem Kampen 6, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

Juli			August			September			Oktober			November			Dezember
1	04:58		05:38		19:10 (WEA06)	06:31		19:20 (WEA06)	07:24		18:04 (WEA05)	07:22		16:11 (WEA09)	08:17
	21:57		21:22	56	20:06 (WEA06)	20:16	23	19:43 (WEA06)	19:03	30	18:34 (WEA05)	16:53	11	16:22 (WEA09)	16:09
2	04:59		05:39		19:09 (WEA06)	06:33		19:24 (WEA06)	07:26		18:05 (WEA04)	07:24		16:12 (WEA09)	08:18
	21:57		21:21	57	20:06 (WEA06)	20:14	13	19:37 (WEA06)	19:01	27	18:32 (WEA05)	16:51	7	16:19 (WEA09)	16:08
3	05:00		05:41		19:09 (WEA06)	06:35			07:28		18:04 (WEA04)	07:26		16:13 (WEA09)	08:20
	21:57		21:19	57	20:06 (WEA06)	20:12			18:58	26	18:30 (WEA05)	16:49	4	16:17 (WEA09)	16:08
4	05:00		05:43		19:09 (WEA06)	06:37			07:30		18:04 (WEA04)	07:28			08:21
	21:56		21:17	58	20:07 (WEA06)	20:09			18:56	23	18:27 (WEA04)	16:47			16:07
5	05:01		05:44		19:08 (WEA06)	06:38			07:31		18:03 (WEA04)	07:30			08:22
	21:56		21:15	59	20:07 (WEA06)	20:07			18:53	22	18:25 (WEA04)	16:45			16:06
6	05:02		05:46		19:08 (WEA06)	06:40			07:33		18:03 (WEA04)	07:32			08:24
	21:55		21:13	59	20:07 (WEA06)	20:04			18:51	20	18:23 (WEA04)	16:43			16:06
7	05:03		05:48		19:07 (WEA06)	06:42			07:35		18:03 (WEA04)	07:34			08:25
	21:54		21:11	60	20:07 (WEA06)	20:02			18:49	17	18:20 (WEA04)	16:41			16:05
8	05:04		05:49		19:07 (WEA06)	06:44			07:37		18:02 (WEA04)	07:35			08:26
	21:54		21:09	60	20:07 (WEA06)	20:00			18:46	15	18:17 (WEA04)	16:40			16:05
9	05:05		05:51		19:07 (WEA06)	06:45			07:39		18:03 (WEA04)	07:37			08:28
	21:53		21:07	61	20:08 (WEA06)	19:57			18:44	12	18:15 (WEA04)	16:38			16:05
10	05:06		05:53		19:06 (WEA06)	06:47			07:40		18:03 (WEA04)	07:39			08:29
	21:52	10	19:43 (WEA06)	21:05	61	20:07 (WEA06)	19:55			18:41	9	18:12 (WEA04)	16:36			16:04
11	05:07		19:30 (WEA06)	05:55		19:06 (WEA06)	06:49			07:42		18:04 (WEA04)	07:41			08:30
	21:51	15	19:45 (WEA06)	21:03	61	20:07 (WEA06)	19:52			18:39	6	18:10 (WEA04)	16:34			16:04
12	05:08		19:29 (WEA06)	05:56		19:06 (WEA06)	06:51			07:44		18:06 (WEA04)	07:43			08:31
	21:50	18	19:47 (WEA06)	21:01	60	20:06 (WEA06)	19:50			18:37	2	18:08 (WEA04)	16:33			16:04
13	05:10		19:27 (WEA06)	05:58		19:06 (WEA06)	06:52			07:46			07:45			08:32
	21:49	22	19:49 (WEA06)	20:59	60	20:06 (WEA06)	19:47			18:34			16:31			16:04
14	05:11		19:25 (WEA06)	06:00		19:06 (WEA06)	06:54			07:48			07:47			08:33
	21:48	25	19:50 (WEA06)	20:57	61	20:07 (WEA06)	19:45			18:32			16:30			16:04
15	05:12		19:24 (WEA06)	06:02		19:05 (WEA06)	06:56		18:22 (WEA05)	07:50			07:49			08:34
	21:47	28	19:52 (WEA06)	20:55	61	20:06 (WEA06)	19:42	10	18:32 (WEA05)	18:30			16:28			16:04
16	05:13		19:22 (WEA06)	06:03		19:06 (WEA06)	06:58		18:18 (WEA05)	07:52			07:51			08:35
	21:46	31	19:53 (WEA06)	20:53	59	20:05 (WEA06)	19:40	18	18:36 (WEA05)	18:27			16:26			16:04
17	05:15		19:22 (WEA06)	06:05		19:06 (WEA06)	06:59		18:16 (WEA05)	07:53		17:18 (WEA09)	07:52			08:36
	21:45	33	19:55 (WEA06)	20:51	59	20:05 (WEA06)	19:37	22	18:38 (WEA05)	18:25	12	17:30 (WEA09)	16:25			16:04
18	05:16		19:21 (WEA06)	06:07		19:06 (WEA06)	07:01		18:13 (WEA05)	07:55		17:15 (WEA09)	07:54			08:37
	21:44	35	19:56 (WEA06)	20:48	58	20:04 (WEA06)	19:35	26	18:39 (WEA05)	18:23	17	17:32 (WEA09)	16:24			16:04
19	05:18		19:20 (WEA06)	06:09		19:06 (WEA06)	07:03		18:11 (WEA05)	07:57		17:14 (WEA09)	07:56			08:37
	21:42	36	19:56 (WEA06)	20:46	58	20:04 (WEA06)	19:33	29	18:40 (WEA05)	18:21	19	17:33 (WEA09)	16:22			16:04
20	05:19		19:19 (WEA06)	06:10		19:07 (WEA06)	07:05		18:10 (WEA05)	07:59		17:12 (WEA09)	07:58			08:38
	21:41	39	19:58 (WEA06)	20:44	56	20:03 (WEA06)	19:30	31	18:41 (WEA05)	18:18	22	17:34 (WEA09)	16:21			16:05
21	05:20		19:18 (WEA06)	06:12		19:06 (WEA06)	07:06		18:09 (WEA05)	08:01		17:11 (WEA09)	08:00			08:39
	21:40	41	19:59 (WEA06)	20:42	56	20:02 (WEA06)	19:28	33	18:42 (WEA05)	18:16	24	17:35 (WEA09)	16:19			16:05
22	05:22		19:17 (WEA06)	06:14		19:07 (WEA06)	07:08		18:07 (WEA05)	08:03		17:10 (WEA09)	08:02			08:39
	21:38	42	19:59 (WEA06)	20:40	54	20:01 (WEA06)	19:25	34	18:41 (WEA05)	18:14	26	17:36 (WEA09)	16:18			16:06
23	05:23		19:17 (WEA06)	06:16		19:08 (WEA06)	07:10		18:07 (WEA05)	08:05		17:09 (WEA09)	08:03			08:40
	21:37	44	20:01 (WEA06)	20:37	53	20:01 (WEA06)	19:23	34	18:41 (WEA05)	18:12	27	17:36 (WEA09)	16:17			16:06
24	05:25		19:15 (WEA06)	06:17		19:08 (WEA06)	07:12		18:06 (WEA05)	08:07		17:09 (WEA09)	08:05			08:40
	21:36	46	20:01 (WEA06)	20:35	51	19:59 (WEA06)	19:20	36	18:42 (WEA05)	18:10	27	17:36 (WEA09)	16:16			16:07
25	05:26		19:15 (WEA06)	06:19		19:09 (WEA06)	07:13		18:06 (WEA05)	07:09		16:09 (WEA09)	08:07			08:40
	21:34	47	20:02 (WEA06)	20:33	49	19:58 (WEA06)	19:18	36	18:42 (WEA05)	17:07	27	16:36 (WEA09)	16:15			16:07
26	05:28		19:14 (WEA06)	06:21		19:10 (WEA06)	07:15		18:05 (WEA05)	07:10		16:08 (WEA09)	08:08			08:41
	21:32	49	20:03 (WEA06)	20:30	47	19:57 (WEA06)	19:15	36	18:41 (WEA05)	17:05	27	16:35 (WEA09)	16:14			16:08
27	05:29		19:13 (WEA06)	06:23		19:10 (WEA06)	07:17		18:04 (WEA05)	07:12		16:08 (WEA09)	08:10			08:41
	21:31	50	20:03 (WEA06)	20:28	45	19:55 (WEA06)	19:13	37	18:41 (WEA05)	17:03	25	16:33 (WEA09)	16:13			16:09
28	05:31		19:13 (WEA06)	06:24		19:12 (WEA06)	07:19		18:04 (WEA05)	07:14		16:08 (WEA09)	08:12			08:41
	21:29	51	20:04 (WEA06)	20:26	41	19:53 (WEA06)	19:10	36	18:40 (WEA05)	17:01	22	16:30 (WEA09)	16:12			16:10
29	05:33		19:12 (WEA06)	06:26		19:14 (WEA06)	07:21		18:05 (WEA05)	07:16		16:09 (WEA09)	08:13			08:41
	21:28	52	20:04 (WEA06)	20:23	38	19:52 (WEA06)	19:08	35	18:40 (WEA05)	16:59	19	16:28 (WEA09)	16:11			16:11
30	05:34		19:11 (WEA06)	06:28		19:15 (WEA06)	07:22		18:05 (WEA05)	07:18		16:09 (WEA09)	08:15			08:41
	21:26	54	20:05 (WEA06)	20:21	34	19:49 (WEA06)	19:05	32	18:37 (WEA05)	16:57	17	16:26 (WEA09)	16:10			16:12
31	05:36		19:10 (WEA06)	06:30		19:17 (WEA06)				07:20		16:10 (WEA09)				08:41
	21:24	55	20:05 (WEA06)	20:19	29	19:46 (WEA06)				16:55	14	16:24 (WEA09)				16:13
Sonnenscheinstunden	511			459			382			329			260			234
astr.max.mögl.Beschattung	823			1678			521			534			22			
Red.Sonnenscheinwahrsch.	0,38			0,42			0,35			0,29			0,19			
Reduktion Betriebsdauer	0,95			0,95			0,95			0,95			0,95			
Reduktion Windrichtung	0,63			0,63			0,65			0,67			0,68			
Gesamte Reduktion	0,23			0,25			0,22			0,19			0,13			
Met.wahrsch.Beschattung	187			427			113			99			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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP13 - Auf dem Kampen 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar		März		April		Mai		Juni
1	08:41	08:11		07:14		16:59 (WEA09)	07:00		05:51	19:13 (WEA06) 05:02
	16:14	17:05		18:00	7	17:06 (WEA09)	19:58		20:53	53 20:06 (WEA06) 21:43
2	08:41	08:10		07:12			06:57		05:49	19:13 (WEA06) 05:01
	16:15	17:07		18:02			20:00		20:55	53 20:06 (WEA06) 21:44
3	08:41	08:08		07:10			06:55		05:47	19:12 (WEA06) 05:00
	16:16	17:09		18:04			20:02		20:57	54 20:06 (WEA06) 21:45
4	08:41	08:06		07:07			06:52		05:45	19:12 (WEA06) 04:59
	16:17	17:11		18:06			20:04		20:58	54 20:06 (WEA06) 21:46
5	08:40	08:04		07:05			06:50		05:43	19:12 (WEA06) 04:59
	16:19	17:13		18:08			20:05		21:00	53 20:05 (WEA06) 21:47
6	08:40	08:03		07:03			06:48		05:41	19:12 (WEA06) 04:58
	16:20	17:15		18:10			20:07		21:02	53 20:05 (WEA06) 21:48
7	08:40	08:01		07:00			06:45		05:39	19:12 (WEA06) 04:57
	16:21	17:17		18:12			20:09		21:04	53 20:05 (WEA06) 21:49
8	08:39	07:59		06:58			06:43		05:37	19:13 (WEA06) 04:57
	16:23	17:19		18:14			20:11		21:06	52 20:05 (WEA06) 21:50
9	08:38	07:57		06:56			06:40		05:35	19:13 (WEA06) 04:56
	16:24	17:21		18:15			20:13		21:07	51 20:04 (WEA06) 21:51
10	08:38	07:55		06:53			06:38		05:33	19:13 (WEA06) 04:55
	16:26	17:23		18:17			20:15		21:09	51 20:04 (WEA06) 21:52
11	08:37	07:53		06:51		17:48 (WEA05)	06:36		05:32	19:14 (WEA06) 04:55
	16:27	17:25		18:19	5	17:53 (WEA05)	20:16		21:11	50 20:04 (WEA06) 21:53
12	08:36	07:51		06:48		17:44 (WEA05)	06:33		05:30	19:14 (WEA06) 04:55
	16:29	17:27		18:21	10	17:54 (WEA05)	20:18		21:12	49 20:03 (WEA06) 21:53
13	08:36	07:49		16:56 (WEA09)	06:46	17:42 (WEA05)	06:31	19:40 (WEA06)	05:28	19:14 (WEA06) 04:54
	16:30	17:29	3	16:59 (WEA09)	18:23	15 17:57 (WEA05)	20:20	6 19:46 (WEA06)	21:14	48 20:02 (WEA06) 21:54
14	08:35	07:47		16:54 (WEA09)	06:44	17:40 (WEA05)	06:29	19:34 (WEA06)	05:26	19:16 (WEA06) 04:54
	16:32	17:31	7	17:01 (WEA09)	18:25	18 17:58 (WEA05)	20:22	18 19:52 (WEA06)	21:16	46 20:02 (WEA06) 21:55
15	08:34	07:45		16:53 (WEA09)	06:41	17:39 (WEA05)	06:26	19:29 (WEA06)	05:25	19:16 (WEA06) 04:54
	16:33	17:33	11	17:04 (WEA09)	18:27	21 18:00 (WEA05)	20:24	25 19:54 (WEA06)	21:18	45 20:01 (WEA06) 21:55
16	08:33	07:43		16:52 (WEA09)	06:39	17:37 (WEA05)	06:24	19:27 (WEA06)	05:23	19:17 (WEA06) 04:54
	16:35	17:35	14	17:06 (WEA09)	18:29	25 18:02 (WEA05)	20:26	30 19:57 (WEA06)	21:19	44 20:01 (WEA06) 21:56
17	08:32	07:41		16:51 (WEA09)	06:36	17:36 (WEA05)	06:22	19:25 (WEA06)	05:21	19:17 (WEA06) 04:54
	16:37	17:37	16	17:07 (WEA09)	18:30	28 18:04 (WEA05)	20:27	34 19:59 (WEA06)	21:21	43 20:00 (WEA06) 21:56
18	08:31	07:39		16:51 (WEA09)	06:34	17:35 (WEA05)	06:19	19:23 (WEA06)	05:20	19:18 (WEA06) 04:54
	16:39	17:39	19	17:10 (WEA09)	18:32	30 18:05 (WEA05)	20:29	37 20:00 (WEA06)	21:22	42 20:00 (WEA06) 21:57
19	08:30	07:37		16:50 (WEA09)	06:31	17:35 (WEA05)	06:17	19:21 (WEA06)	05:18	19:19 (WEA06) 04:54
	16:40	17:41	22	17:12 (WEA09)	18:34	33 18:08 (WEA05)	20:31	40 20:01 (WEA06)	21:24	39 19:58 (WEA06) 21:57
20	08:29	07:35		16:50 (WEA09)	06:29	17:35 (WEA05)	06:15	19:20 (WEA06)	05:17	19:20 (WEA06) 04:54
	16:42	17:43	25	17:15 (WEA09)	18:36	33 18:08 (WEA05)	20:33	42 20:02 (WEA06)	21:26	38 19:58 (WEA06) 21:58
21	08:27	07:32		16:50 (WEA09)	06:27	17:34 (WEA05)	06:13	19:19 (WEA06)	05:15	19:21 (WEA06) 04:54
	16:44	17:45	26	17:16 (WEA09)	18:38	34 18:08 (WEA05)	20:35	44 20:03 (WEA06)	21:27	36 19:57 (WEA06) 21:58
22	08:26	07:30		16:50 (WEA09)	06:24	17:34 (WEA05)	06:10	19:18 (WEA06)	05:14	19:22 (WEA06) 04:54
	16:46	17:46	26	17:16 (WEA09)	18:40	34 18:08 (WEA05)	20:37	46 20:04 (WEA06)	21:29	35 19:57 (WEA06) 21:58
23	08:25	07:28		16:51 (WEA09)	06:22	17:33 (WEA05)	06:08	19:17 (WEA06)	05:12	19:23 (WEA06) 04:54
	16:48	17:48	25	17:16 (WEA09)	18:42	34 18:07 (WEA05)	20:38	47 20:04 (WEA06)	21:30	32 19:55 (WEA06) 21:58
24	08:24	07:26		16:51 (WEA09)	06:19	17:34 (WEA05)	06:06	19:16 (WEA06)	05:11	19:24 (WEA06) 04:54
	16:49	17:50	25	17:16 (WEA09)	18:43	32 18:06 (WEA05)	20:40	49 20:05 (WEA06)	21:32	30 19:54 (WEA06) 21:58
25	08:22	07:23		16:51 (WEA09)	06:17	17:34 (WEA05)	06:04	19:15 (WEA06)	05:10	19:26 (WEA06) 04:55
	16:51	17:52	23	17:14 (WEA09)	18:45	31 18:05 (WEA05)	20:42	51 20:06 (WEA06)	21:33	27 19:53 (WEA06) 21:58
26	08:21	07:21		16:53 (WEA09)	06:14	17:35 (WEA05)	06:02	19:15 (WEA06)	05:09	19:27 (WEA06) 04:55
	16:53	17:54	20	17:13 (WEA09)	18:47	29 18:04 (WEA05)	20:44	51 20:06 (WEA06)	21:35	25 19:52 (WEA06) 21:58
27	08:19	07:19		16:54 (WEA09)	06:12	17:35 (WEA05)	05:59	19:13 (WEA06)	05:07	19:29 (WEA06) 04:56
	16:55	17:56	18	17:12 (WEA09)	18:49	28 18:03 (WEA05)	20:46	52 20:05 (WEA06)	21:36	22 19:51 (WEA06) 21:58
28	08:18	07:17		16:56 (WEA09)	06:09	17:36 (WEA05)	05:57	19:13 (WEA06)	05:06	19:31 (WEA06) 04:56
	16:57	17:58	13	17:09 (WEA09)	18:51	26 18:02 (WEA05)	20:48	52 20:05 (WEA06)	21:37	18 19:49 (WEA06) 21:58
29	08:16				07:07	18:38 (WEA05)	05:55	19:12 (WEA06)	05:05	19:33 (WEA06) 04:57
	16:59				19:53	22 19:00 (WEA05)	20:49	53 20:05 (WEA06)	21:39	14 19:47 (WEA06) 21:58
30	08:15				07:05	18:39 (WEA05)	05:53	19:12 (WEA06)	05:04	19:36 (WEA06) 04:57
	17:01				19:54	18 18:57 (WEA05)	20:51	53 20:05 (WEA06)	21:40	9 19:45 (WEA06) 21:58
31	08:13				07:02	18:42 (WEA05)			05:03	
	17:03				19:56	13 18:55 (WEA05)			21:41	
Sonnenscheinstunden	251	274			367		420		493	509
astr.max.mögl.Beschattung			293		526		730		1219	
Red.Sonnenscheinwahrsch.			0,24		0,28		0,37		0,43	
Reduktion Betriebsdauer			0,95		0,95		0,95		0,95	
Reduktion Windrichtung			0,67		0,65		0,62		0,62	
Gesamte Reduktion			0,15		0,17		0,22		0,25	
Met.wahrsch.Beschattung			45		91		161		310	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP13 - Auf dem Kampen 5, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober			November	Dezember
1	04:58			05:38		19:24 (WEA06)	06:31			07:24		18:22 (WEA05)	07:22	08:17
	21:57			21:22	50	20:14 (WEA06)	20:16			19:03	12	18:34 (WEA05)	16:53	16:09
2	04:59			05:39		19:23 (WEA06)	06:33			07:26		18:24 (WEA05)	07:24	08:18
	21:57			21:21	50	20:13 (WEA06)	20:14			19:01	8	18:32 (WEA05)	16:51	16:08
3	05:00			05:41		19:23 (WEA06)	06:35			07:28		18:29 (WEA05)	07:26	08:20
	21:57			21:19	51	20:14 (WEA06)	20:12			18:58	1	18:30 (WEA05)	16:49	16:08
4	05:00			05:43		19:23 (WEA06)	06:37			07:30			07:28	08:21
	21:56			21:17	52	20:15 (WEA06)	20:09			18:56			16:47	16:07
5	05:01			05:44		19:22 (WEA06)	06:38			07:31			07:30	08:22
	21:56			21:15	52	20:14 (WEA06)	20:07			18:53			16:45	16:06
6	05:02			05:46		19:22 (WEA06)	06:40			07:33			07:32	08:24
	21:55			21:13	53	20:15 (WEA06)	20:04			18:51			16:43	16:06
7	05:03			05:48		19:21 (WEA06)	06:42			07:35			07:34	08:25
	21:54			21:11	54	20:15 (WEA06)	20:02			18:49			16:41	16:05
8	05:04			05:49		19:22 (WEA06)	06:44			07:37			07:35	08:26
	21:54			21:09	53	20:15 (WEA06)	20:00			18:46			16:40	16:05
9	05:05			05:51		19:22 (WEA06)	06:45			07:39			07:37	08:28
	21:53			21:07	53	20:15 (WEA06)	19:57			18:44			16:38	16:05
10	05:06			05:53		19:21 (WEA06)	06:47			07:40			07:39	08:29
	21:52			21:05	54	20:15 (WEA06)	19:55			18:41			16:36	16:04
11	05:07			05:55		19:21 (WEA06)	06:49			07:42			07:41	08:30
	21:51			21:03	54	20:15 (WEA06)	19:52			18:39			16:34	16:04
12	05:08			05:56		19:20 (WEA06)	06:51		18:34 (WEA05)	07:44			07:43	08:31
	21:50			21:01	54	20:14 (WEA06)	19:50	11	18:45 (WEA05)	18:37			16:33	16:04
13	05:10		19:47 (WEA06)	05:58		19:21 (WEA06)	06:52		18:31 (WEA05)	07:46		17:31 (WEA09)	07:45	08:32
	21:49	4	19:51 (WEA06)	20:59	53	20:14 (WEA06)	19:47	17	18:48 (WEA05)	18:34	10	17:41 (WEA09)	16:31	16:04
14	05:11		19:43 (WEA06)	06:00		19:21 (WEA06)	06:54		18:28 (WEA05)	07:48		17:28 (WEA09)	07:47	08:33
	21:48	12	19:55 (WEA06)	20:57	53	20:14 (WEA06)	19:45	22	18:50 (WEA05)	18:32	15	17:43 (WEA09)	16:30	16:04
15	05:12		19:40 (WEA06)	06:01		19:20 (WEA06)	06:56		18:26 (WEA05)	07:50		17:26 (WEA09)	07:49	08:34
	21:47	17	19:57 (WEA06)	20:55	53	20:13 (WEA06)	19:42	25	18:51 (WEA05)	18:30	19	17:45 (WEA09)	16:28	16:04
16	05:13		19:38 (WEA06)	06:03		19:21 (WEA06)	06:58		18:24 (WEA05)	07:52		17:24 (WEA09)	07:51	08:35
	21:46	21	19:59 (WEA06)	20:53	52	20:13 (WEA06)	19:40	28	18:52 (WEA05)	18:27	22	17:46 (WEA09)	16:26	16:04
17	05:15		19:38 (WEA06)	06:05		19:22 (WEA06)	06:59		18:23 (WEA05)	07:53		17:23 (WEA09)	07:52	08:36
	21:45	23	20:01 (WEA06)	20:51	50	20:12 (WEA06)	19:37	30	18:53 (WEA05)	18:25	24	17:47 (WEA09)	16:25	16:04
18	05:16		19:36 (WEA06)	06:07		19:21 (WEA06)	07:01		18:21 (WEA05)	07:55		17:22 (WEA09)	07:54	08:37
	21:44	26	20:02 (WEA06)	20:48	50	20:11 (WEA06)	19:35	31	18:52 (WEA05)	18:23	25	17:47 (WEA09)	16:24	16:04
19	05:18		19:35 (WEA06)	06:08		19:22 (WEA06)	07:03		18:21 (WEA05)	07:57		17:22 (WEA09)	07:56	08:37
	21:42	28	20:03 (WEA06)	20:46	49	20:11 (WEA06)	19:33	32	18:53 (WEA05)	18:21	25	17:47 (WEA09)	16:22	16:04
20	05:19		19:34 (WEA06)	06:10		19:23 (WEA06)	07:05		18:20 (WEA05)	07:59		17:21 (WEA09)	07:58	08:38
	21:41	31	20:05 (WEA06)	20:44	47	20:10 (WEA06)	19:30	33	18:53 (WEA05)	18:18	27	17:48 (WEA09)	16:21	16:05
21	05:20		19:33 (WEA06)	06:12		19:22 (WEA06)	07:06		18:20 (WEA05)	08:01		17:21 (WEA09)	08:00	08:39
	21:40	33	20:06 (WEA06)	20:42	46	20:08 (WEA06)	19:28	33	18:53 (WEA05)	18:16	26	17:47 (WEA09)	16:19	16:05
22	05:22		19:31 (WEA06)	06:14		19:23 (WEA06)	07:08		18:18 (WEA05)	08:03		17:21 (WEA09)	08:02	08:39
	21:38	36	20:07 (WEA06)	20:40	44	20:07 (WEA06)	19:25	34	18:52 (WEA05)	18:14	23	17:44 (WEA09)	16:18	16:06
23	05:23		19:31 (WEA06)	06:16		19:25 (WEA06)	07:10		18:18 (WEA05)	08:05		17:21 (WEA09)	08:03	08:40
	21:37	37	20:08 (WEA06)	20:37	42	20:07 (WEA06)	19:23	34	18:52 (WEA05)	18:12	21	17:42 (WEA09)	16:17	16:06
24	05:25		19:30 (WEA06)	06:17		19:25 (WEA06)	07:12		18:18 (WEA05)	08:07		17:21 (WEA09)	08:05	08:40
	21:36	39	20:09 (WEA06)	20:35	39	20:04 (WEA06)	19:20	34	18:52 (WEA05)	18:10	19	17:40 (WEA09)	16:16	16:07
25	05:26		19:30 (WEA06)	06:19		19:26 (WEA06)	07:13		18:19 (WEA05)	07:09		16:21 (WEA09)	08:07	08:40
	21:34	40	20:10 (WEA06)	20:33	37	20:03 (WEA06)	19:18	31	18:50 (WEA05)	17:07	16	16:37 (WEA09)	16:15	16:07
26	05:28		19:28 (WEA06)	06:21		19:28 (WEA06)	07:15		18:18 (WEA05)	07:10		16:22 (WEA09)	08:08	08:41
	21:32	42	20:10 (WEA06)	20:30	33	20:01 (WEA06)	19:15	29	18:47 (WEA05)	17:05	13	16:35 (WEA09)	16:14	16:08
27	05:29		19:27 (WEA06)	06:23		19:29 (WEA06)	07:17		18:18 (WEA05)	07:12		16:23 (WEA09)	08:10	08:41
	21:31	44	20:11 (WEA06)	20:28	30	19:59 (WEA06)	19:13	26	18:44 (WEA05)	17:03	10	16:33 (WEA09)	16:13	16:09
28	05:31		19:27 (WEA06)	06:24		19:32 (WEA06)	07:19		18:19 (WEA05)	07:14		16:24 (WEA09)	08:12	08:41
	21:29	45	20:12 (WEA06)	20:26	24	19:56 (WEA06)	19:10	23	18:42 (WEA05)	17:01	6	16:30 (WEA09)	16:12	16:10
29	05:33		19:26 (WEA06)	06:26		19:35 (WEA06)	07:21		18:20 (WEA05)	07:16		16:26 (WEA09)	08:13	08:41
	21:28	46	20:12 (WEA06)	20:23	18	19:53 (WEA06)	19:08	20	18:40 (WEA05)	16:59	2	16:28 (WEA09)	16:11	16:11
30	05:34		19:26 (WEA06)	06:28		19:41 (WEA06)	07:22		18:21 (WEA05)	07:18			08:15	08:41
	21:26	47	20:13 (WEA06)	20:21	4	19:45 (WEA06)	19:05	16	18:37 (WEA05)	16:57			16:10	16:12
31	05:36		19:25 (WEA06)	06:30						07:20				08:41
	21:24	48	20:13 (WEA06)	20:19						16:55				16:13
Sonnenscheinstunden	511			459			382			329			260	234
astr.max.mögl.Beschattung		619			1354			509			324			
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35			0,29			
Reduktion Betriebsdauer		0,95			0,95			0,95			0,95			
Reduktion Windrichtung		0,62			0,62			0,65			0,67			
Gesamte Reduktion		0,22			0,25			0,22			0,19			
Met.wahrsch.Beschattung		139			340			111			61			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP14 - Heinrich-Evers-Straße 4A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar		März		April		Mai	Juni
1	08:41	08:11		07:14		07:00		19:09 (WEA06)	05:51	05:02
	16:14	17:05		18:00		19:58	22	19:31 (WEA06)	20:53	21:43
2	08:41	08:10		07:12		06:57		19:07 (WEA06)	05:49	05:01
	16:15	17:07		18:02		20:00	26	19:33 (WEA06)	20:55	21:44
3	08:41	08:08		07:10		06:55		19:05 (WEA06)	05:47	05:00
	16:16	17:09		18:04		20:02	30	19:35 (WEA06)	20:57	21:45
4	08:41	08:06		07:07		06:52		19:04 (WEA06)	05:45	04:59
	16:17	17:11		18:06		20:04	33	19:37 (WEA06)	20:58	21:46
5	08:40	08:04		07:05		06:50		19:03 (WEA06)	05:43	04:59
	16:19	17:13		18:08		20:05	36	19:39 (WEA06)	21:00	21:47
6	08:40	08:03		07:03		17:40 (WEA05)	06:48		19:01 (WEA06)	05:41	04:58
	16:20	17:15		18:10	3	17:43 (WEA05)	20:07	38	19:39 (WEA06)	21:02	21:48
7	08:40	08:01		07:00		17:37 (WEA05)	06:45		19:00 (WEA06)	05:39	04:57
	16:21	17:17		18:12	7	17:44 (WEA05)	20:09	40	19:40 (WEA06)	21:04	21:49
8	08:39	07:59		06:58		17:35 (WEA05)	06:43		18:59 (WEA06)	05:37	04:57
	16:23	17:19		18:14	12	17:47 (WEA05)	20:11	41	19:40 (WEA06)	21:06	21:50
9	08:38	07:57		06:56		17:34 (WEA05)	06:40		18:58 (WEA06)	05:35	04:56
	16:24	17:21		18:15	15	17:49 (WEA05)	20:13	42	19:40 (WEA06)	21:07	21:51
10	08:38	07:55		06:53		17:32 (WEA05)	06:38		18:58 (WEA06)	05:33	04:55
	16:26	17:23		18:17	19	17:51 (WEA05)	20:15	43	19:41 (WEA06)	21:09	21:52
11	08:37	07:53		06:51		17:32 (WEA05)	06:36		18:57 (WEA06)	05:32	04:55
	16:27	17:25		18:19	21	17:53 (WEA05)	20:16	43	19:40 (WEA06)	21:11	21:53
12	08:36	07:51	16:55 (WEA09)	06:48		17:31 (WEA05)	06:33		18:57 (WEA06)	05:30	04:55
	16:29	17:27	2 16:57 (WEA09)	18:21	23	17:54 (WEA05)	20:18	43	19:40 (WEA06)	21:12	21:53
13	08:36	07:49	16:54 (WEA09)	06:46		17:30 (WEA05)	06:31		18:57 (WEA06)	05:28	04:54
	16:30	17:29	5 16:59 (WEA09)	18:23	27	17:57 (WEA05)	20:20	43	19:40 (WEA06)	21:14	21:54
14	08:35	07:47	16:53 (WEA09)	06:44		17:29 (WEA05)	06:29		18:57 (WEA06)	05:26	04:54
	16:32	17:31	8 17:01 (WEA09)	18:25	29	17:58 (WEA05)	20:22	43	19:40 (WEA06)	21:16	21:55
15	08:34	07:45	16:52 (WEA09)	06:41		17:30 (WEA05)	06:26		18:56 (WEA06)	05:25	04:54
	16:33	17:33	12 17:04 (WEA09)	18:27	29	17:59 (WEA05)	20:24	43	19:39 (WEA06)	21:18	21:55
16	08:33	07:43	16:52 (WEA09)	06:39		17:29 (WEA05)	06:24		18:56 (WEA06)	05:23	04:54
	16:35	17:35	14 17:06 (WEA09)	18:29	29	17:58 (WEA05)	20:26	43	19:39 (WEA06)	21:19	21:56
17	08:32	07:41	16:51 (WEA09)	06:36		17:30 (WEA05)	06:22		18:57 (WEA06)	05:21	04:54
	16:37	17:37	16 17:07 (WEA09)	18:30	27	17:57 (WEA05)	20:27	41	19:38 (WEA06)	21:21	21:56
18	08:31	07:39	16:51 (WEA09)	06:34		17:29 (WEA05)	06:19		18:57 (WEA06)	05:20	04:54
	16:39	17:39	19 17:10 (WEA09)	18:32	27	17:56 (WEA05)	20:29	41	19:38 (WEA06)	21:22	21:57
19	08:30	07:37	16:51 (WEA09)	06:31		17:30 (WEA05)	06:17		18:57 (WEA06)	05:18	04:54
	16:40	17:41	21 17:12 (WEA09)	18:34	25	17:55 (WEA05)	20:31	39	19:36 (WEA06)	21:24	21:57
20	08:29	07:35	16:52 (WEA09)	06:29		17:32 (WEA05)	06:15		18:58 (WEA06)	05:17	04:54
	16:42	17:43	22 17:14 (WEA09)	18:36	23	17:55 (WEA05)	20:33	37	19:35 (WEA06)	21:26	21:58
21	08:27	07:32	16:51 (WEA09)	06:27		17:32 (WEA05)	06:13		18:59 (WEA06)	05:15	04:54
	16:44	17:44	22 17:13 (WEA09)	18:38	20	17:52 (WEA05)	20:35	35	19:34 (WEA06)	21:27	21:58
22	08:26	07:30	16:52 (WEA09)	06:24		17:34 (WEA05)	06:10		19:00 (WEA06)	05:14	04:54
	16:46	17:46	21 17:13 (WEA09)	18:40	17	17:51 (WEA05)	20:37	33	19:33 (WEA06)	21:29	21:58
23	08:25	07:28	16:53 (WEA09)	06:22		17:37 (WEA05)	06:08		19:01 (WEA06)	05:12	04:54
	16:48	17:48	19 17:12 (WEA09)	18:42	10	17:47 (WEA05)	20:38	31	19:32 (WEA06)	21:30	21:58
24	08:24	07:26	16:55 (WEA09)	06:19			06:06		19:02 (WEA06)	05:11	04:54
	16:49	17:50	16 17:11 (WEA09)	18:43			20:40	29	19:31 (WEA06)	21:32	21:58
25	08:22	07:23	16:56 (WEA09)	06:17			06:04		19:04 (WEA06)	05:10	04:55
	16:51	17:52	12 17:08 (WEA09)	18:45			20:42	25	19:29 (WEA06)	21:33	21:58
26	08:21	07:21	17:00 (WEA09)	06:14			06:02		19:05 (WEA06)	05:09	04:55
	16:53	17:54	5 17:05 (WEA09)	18:47			20:44	21	19:26 (WEA06)	21:35	21:58
27	08:19	07:19		06:12			05:59		19:07 (WEA06)	05:07	04:56
	16:55	17:56		18:49			20:46	16	19:23 (WEA06)	21:36	21:58
28	08:18	07:17		06:09			05:57		19:12 (WEA06)	05:06	04:56
	16:57	17:58		18:51			20:48	6	19:18 (WEA06)	21:37	21:58
29	08:16			07:07			05:55			05:05	04:57
	16:59			19:53			20:49			21:39	21:58
30	08:15			07:05		19:16 (WEA06)	05:53			05:04	04:57
	17:01			19:54	12	19:28 (WEA06)	20:51			21:40	21:58
31	08:13			07:02		19:12 (WEA06)				05:03	
	17:03			19:56	18	19:30 (WEA06)				21:41	
Sonnenscheinstunden	251	274		367			420			493	509
astr.max.mögl.Beschattung			214		393			963			
Red.Sonnenscheinwahrsch.			0,24		0,28			0,37			
Reduktion Betriebsdauer			0,95		0,95			0,95			
Reduktion Windrichtung			0,67		0,65			0,65			
Gesamte Reduktion			0,15		0,17			0,23			
Met.wahrsch.Beschattung			33		68			221			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP14 - Heinrich-Evers-Straße 4A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August			September			Oktober			November	Dezember
1	04:58	05:38			06:31		18:57 (WEA06)	07:24		18:09 (WEA05)	07:22	08:17
	21:57	21:22			20:16	43	19:40 (WEA06)	19:03	25	18:34 (WEA05)	16:53	16:09
2	04:59	05:39			06:33		18:56 (WEA06)	07:26		18:10 (WEA05)	07:24	08:18
	21:57	21:21			20:14	43	19:39 (WEA06)	19:01	22	18:32 (WEA05)	16:51	16:08
3	05:00	05:41			06:35		18:56 (WEA06)	07:28		18:10 (WEA05)	07:26	08:20
	21:57	21:19			20:12	42	19:38 (WEA06)	18:58	20	18:30 (WEA05)	16:49	16:08
4	05:00	05:43			06:37		18:57 (WEA06)	07:30		18:11 (WEA05)	07:28	08:21
	21:56	21:17			20:09	41	19:38 (WEA06)	18:56	16	18:27 (WEA05)	16:47	16:07
5	05:01	05:44			06:38		18:56 (WEA06)	07:31		18:12 (WEA05)	07:30	08:22
	21:56	21:15			20:07	40	19:36 (WEA06)	18:53	13	18:25 (WEA05)	16:45	16:06
6	05:02	05:46			06:40		18:57 (WEA06)	07:33		18:13 (WEA05)	07:32	08:24
	21:55	21:13			20:04	39	19:36 (WEA06)	18:51	10	18:23 (WEA05)	16:43	16:06
7	05:03	05:48			06:42		18:58 (WEA06)	07:35		18:14 (WEA05)	07:34	08:25
	21:54	21:11			20:02	36	19:34 (WEA06)	18:49	5	18:19 (WEA05)	16:41	16:05
8	05:04	05:49			06:44		18:58 (WEA06)	07:37			07:35	08:26
	21:54	21:09			19:59	33	19:31 (WEA06)	18:46			16:40	16:05
9	05:05	05:51			06:45		18:59 (WEA06)	07:39			07:37	08:28
	21:53	21:07			19:57	30	19:29 (WEA06)	18:44			16:38	16:05
10	05:06	05:53			06:47		19:00 (WEA06)	07:40			07:39	08:29
	21:52	21:05			19:55	27	19:27 (WEA06)	18:41			16:36	16:04
11	05:07	05:55			06:49		19:01 (WEA06)	07:42			07:41	08:30
	21:51	21:03			19:52	23	19:24 (WEA06)	18:39			16:34	16:04
12	05:08	05:56			06:51		19:03 (WEA06)	07:44			07:43	08:31
	21:50	21:01			19:50	19	19:22 (WEA06)	18:37			16:33	16:04
13	05:10	05:58			06:52		19:07 (WEA06)	07:46			07:45	08:32
	21:49	20:59			19:47	12	19:19 (WEA06)	18:34			16:31	16:04
14	05:11	06:00			06:54			07:48			07:47	08:33
	21:48	20:57			19:45			18:32			16:30	16:04
15	05:12	06:01		19:18 (WEA06)	06:56			07:50			07:49	08:34
	21:47	20:55	9	19:27 (WEA06)	19:42			18:30			16:28	16:04
16	05:13	06:03		19:14 (WEA06)	06:58			07:52		17:30 (WEA09)	07:51	08:35
	21:46	20:53	17	19:31 (WEA06)	19:40			18:27	9	17:39 (WEA09)	16:26	16:04
17	05:15	06:05		19:12 (WEA06)	06:59			07:53		17:27 (WEA09)	07:52	08:36
	21:45	20:51	22	19:34 (WEA06)	19:37			18:25	14	17:41 (WEA09)	16:25	16:04
18	05:16	06:07		19:09 (WEA06)	07:01			07:55		17:25 (WEA09)	07:54	08:37
	21:44	20:48	26	19:35 (WEA06)	19:35			18:23	18	17:43 (WEA09)	16:24	16:04
19	05:17	06:08		19:07 (WEA06)	07:03			07:57		17:24 (WEA09)	07:56	08:37
	21:42	20:46	30	19:37 (WEA06)	19:33			18:21	20	17:44 (WEA09)	16:22	16:04
20	05:19	06:10		19:06 (WEA06)	07:05		18:24 (WEA05)	07:59		17:23 (WEA09)	07:58	08:38
	21:41	20:44	32	19:38 (WEA06)	19:30	8	18:32 (WEA05)	18:18	21	17:44 (WEA09)	16:21	16:05
21	05:20	06:12		19:04 (WEA06)	07:06		18:21 (WEA05)	08:01		17:22 (WEA09)	08:00	08:39
	21:40	20:42	34	19:38 (WEA06)	19:28	14	18:35 (WEA05)	18:16	23	17:45 (WEA09)	16:19	16:05
22	05:22	06:14		19:03 (WEA06)	07:08		18:17 (WEA05)	08:03		17:22 (WEA09)	08:02	08:39
	21:38	20:40	36	19:39 (WEA06)	19:25	19	18:36 (WEA05)	18:14	22	17:44 (WEA09)	16:18	16:06
23	05:23	06:16		19:02 (WEA06)	07:10		18:16 (WEA05)	08:05		17:21 (WEA09)	08:03	08:40
	21:37	20:37	38	19:40 (WEA06)	19:23	22	18:38 (WEA05)	18:12	21	17:42 (WEA09)	16:17	16:06
24	05:25	06:17		19:01 (WEA06)	07:12		18:14 (WEA05)	08:07		17:21 (WEA09)	08:05	08:40
	21:35	20:35	39	19:40 (WEA06)	19:20	25	18:39 (WEA05)	18:10	19	17:40 (WEA09)	16:16	16:07
25	05:26	06:19		19:00 (WEA06)	07:13		18:13 (WEA05)	07:09		16:21 (WEA09)	08:07	08:40
	21:34	20:33	41	19:41 (WEA06)	19:18	27	18:40 (WEA05)	17:07	16	16:37 (WEA09)	16:15	16:07
26	05:28	06:21		19:00 (WEA06)	07:15		18:12 (WEA05)	07:10		16:22 (WEA09)	08:08	08:41
	21:32	20:30	41	19:41 (WEA06)	19:15	27	18:39 (WEA05)	17:05	13	16:35 (WEA09)	16:14	16:08
27	05:29	06:23		18:58 (WEA06)	07:17		18:11 (WEA05)	07:12		16:22 (WEA09)	08:10	08:41
	21:31	20:28	42	19:40 (WEA06)	19:13	28	18:39 (WEA05)	17:03	11	16:33 (WEA09)	16:13	16:09
28	05:31	06:24		18:58 (WEA06)	07:19		18:11 (WEA05)	07:14		16:23 (WEA09)	08:12	08:41
	21:29	20:26	43	19:41 (WEA06)	19:10	28	18:39 (WEA05)	17:01	7	16:30 (WEA09)	16:12	16:10
29	05:33	06:26		18:58 (WEA06)	07:21		18:10 (WEA05)	07:16		16:23 (WEA09)	08:13	08:41
	21:28	20:23	43	19:41 (WEA06)	19:08	29	18:39 (WEA05)	16:59	5	16:28 (WEA09)	16:11	16:11
30	05:34	06:28		18:57 (WEA06)	07:22		18:10 (WEA05)	07:18		16:25 (WEA09)	08:15	08:41
	21:26	20:21	43	19:40 (WEA06)	19:05	27	18:37 (WEA05)	16:57	1	16:26 (WEA09)	16:10	16:12
31	05:36	06:30		18:57 (WEA06)				07:20				08:41
	21:24	20:19	43	19:40 (WEA06)				16:55				16:13
Sonnenscheinstunden	511	459			382			329			260	234
astr.max.mögl.Beschattung			579			682			331			
Red.Sonnenscheinwahrsch.			0,42			0,35			0,29			
Reduktion Betriebsdauer			0,95			0,95			0,95			
Reduktion Windrichtung			0,65			0,65			0,67			
Gesamte Reduktion			0,26			0,22			0,19			
Met.wahrsch.Beschattung			151			147			62			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP15 - Heinrich-Evers-Straße 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März			April			Mai	Juni
1	08:41	08:11	07:14			07:00			05:51	05:02
	16:14	17:05	18:00			19:58			20:53	21:43
2	08:41	08:10	07:12			06:57			05:49	05:01
	16:15	17:07	18:02			20:00			20:55	21:44
3	08:41	08:08	07:10			06:55			05:47	05:00
	16:16	17:09	18:04			20:02			20:57	21:45
4	08:41	08:06	07:07			06:52			05:45	04:59
	16:17	17:11	18:06			20:04			20:58	21:46
5	08:40	08:04	07:05			06:50		19:32 (WEA06)	05:43	04:59
	16:19	17:13	18:08			20:05	7	19:39 (WEA06)	21:00	21:47
6	08:40	08:03	07:03			06:48		19:27 (WEA06)	05:41	04:58
	16:20	17:15	18:10			20:07	13	19:40 (WEA06)	21:02	21:48
7	08:40	08:01	07:00			06:45		19:25 (WEA06)	05:39	04:57
	16:21	17:17	18:12			20:09	17	19:42 (WEA06)	21:04	21:49
8	08:39	07:59	06:58			06:43		19:22 (WEA06)	05:37	04:57
	16:23	17:19	18:14			20:11	21	19:43 (WEA06)	21:06	21:50
9	08:38	07:57	06:56			06:40		19:21 (WEA06)	05:35	04:56
	16:24	17:21	18:15			20:13	24	19:45 (WEA06)	21:07	21:51
10	08:38	07:55	06:53			06:38		19:20 (WEA06)	05:33	04:55
	16:26	17:23	18:17			20:15	28	19:48 (WEA06)	21:09	21:52
11	08:37	07:53	06:51			06:36		19:18 (WEA06)	05:32	04:55
	16:27	17:25	18:19			20:16	31	19:49 (WEA06)	21:11	21:53
12	08:36	07:51	06:48			06:33		19:17 (WEA06)	05:30	04:55
	16:29	17:27	18:21			20:18	34	19:51 (WEA06)	21:12	21:53
13	08:36	07:49	06:46		17:53 (WEA05)	06:31		19:17 (WEA06)	05:28	04:54
	16:30	17:29	18:23	4	17:57 (WEA05)	20:20	35	19:52 (WEA06)	21:14	21:54
14	08:35	07:47	06:44		17:50 (WEA05)	06:29		19:17 (WEA06)	05:26	04:54
	16:32	17:31	18:25	8	17:58 (WEA05)	20:22	36	19:53 (WEA06)	21:16	21:55
15	08:34	07:45	06:41		17:49 (WEA05)	06:26		19:15 (WEA06)	05:25	04:54
	16:33	17:33	18:27	11	18:00 (WEA05)	20:24	37	19:52 (WEA06)	21:18	21:55
16	08:33	07:43	06:39		17:47 (WEA05)	06:24		19:15 (WEA06)	05:23	04:54
	16:35	17:35	18:29	15	18:02 (WEA05)	20:26	37	19:52 (WEA06)	21:19	21:56
17	08:32	07:41	06:36		17:47 (WEA05)	06:22		19:15 (WEA06)	05:21	04:54
	16:37	17:37	18:30	17	18:04 (WEA05)	20:27	37	19:52 (WEA06)	21:21	21:56
18	08:31	07:39	06:34		17:45 (WEA05)	06:19		19:15 (WEA06)	05:20	04:54
	16:39	17:39	18:32	20	18:05 (WEA05)	20:29	37	19:52 (WEA06)	21:22	21:57
19	08:30	07:37	06:31		17:45 (WEA05)	06:17		19:14 (WEA06)	05:18	04:54
	16:40	17:41	18:34	23	18:08 (WEA05)	20:31	37	19:51 (WEA06)	21:24	21:57
20	08:29	07:34	06:29		17:45 (WEA05)	06:15		19:15 (WEA06)	05:17	04:54
	16:42	17:43	18:36	25	18:10 (WEA05)	20:33	36	19:51 (WEA06)	21:26	21:58
21	08:27	07:32	06:27		17:44 (WEA05)	06:13		19:15 (WEA06)	05:15	04:54
	16:44	17:44	18:38	27	18:11 (WEA05)	20:35	35	19:50 (WEA06)	21:27	21:58
22	08:26	07:30	06:24		17:45 (WEA05)	06:10		19:15 (WEA06)	05:14	04:54
	16:46	17:46	18:40	26	18:11 (WEA05)	20:37	35	19:50 (WEA06)	21:29	21:58
23	08:25	07:28	06:22		17:45 (WEA05)	06:08		19:16 (WEA06)	05:12	04:54
	16:48	17:48	18:42	24	18:09 (WEA05)	20:38	33	19:49 (WEA06)	21:30	21:58
24	08:24	07:26	06:19		17:45 (WEA05)	06:06		19:17 (WEA06)	05:11	04:54
	16:49	17:50	18:43	24	18:09 (WEA05)	20:40	31	19:48 (WEA06)	21:32	21:58
25	08:22	07:23	06:17		17:46 (WEA05)	06:04		19:17 (WEA06)	05:10	04:55
	16:51	17:52	18:45	21	18:07 (WEA05)	20:42	30	19:47 (WEA06)	21:33	21:58
26	08:21	07:21	06:14		17:47 (WEA05)	06:02		19:17 (WEA06)	05:09	04:55
	16:53	17:54	18:47	19	18:06 (WEA05)	20:44	28	19:45 (WEA06)	21:35	21:58
27	08:19	07:19	06:12		17:48 (WEA05)	05:59		19:19 (WEA06)	05:07	04:56
	16:55	17:56	18:49	15	18:03 (WEA05)	20:46	25	19:44 (WEA06)	21:36	21:58
28	08:18	07:17	06:09		17:51 (WEA05)	05:57		19:20 (WEA06)	05:06	04:56
	16:57	17:58	18:51	9	18:00 (WEA05)	20:48	22	19:42 (WEA06)	21:37	21:58
29	08:16		07:07			05:55		19:22 (WEA06)	05:05	04:57
	16:59		19:53			20:49	18	19:40 (WEA06)	21:39	21:58
30	08:15		07:05			05:53		19:25 (WEA06)	05:04	04:57
	17:01		19:54			20:51	12	19:37 (WEA06)	21:40	21:58
31	08:13		07:02						05:03	
	17:03		19:56						21:41	
Sonnenscheinstunden	251	274	367			420			493	509
astr.max.mögl.Beschattung				288			736			
Red.Sonnenscheinwahrsch.				0,28			0,37			
Reduktion Betriebsdauer				0,95			0,95			
Reduktion Windrichtung				0,65			0,64			
Gesamte Reduktion				0,17			0,23			
Met.wahrsch.Beschattung				50			167			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP15 - Heinrich-Evers-Straße 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August			September			Oktober	November	Dezember
1	04:58	05:38			06:31		19:18 (WEA06)	07:24	07:22	08:17
	21:57	21:22			20:16	30	19:48 (WEA06)	19:03	16:53	16:09
2	04:59	05:39			06:33		19:18 (WEA06)	07:26	07:24	08:18
	21:57	21:21			20:14	27	19:45 (WEA06)	19:01	16:51	16:08
3	05:00	05:41			06:35		19:19 (WEA06)	07:28	07:26	08:20
	21:57	21:19			20:12	24	19:43 (WEA06)	18:58	16:49	16:08
4	05:00	05:43			06:37		19:20 (WEA06)	07:30	07:28	08:21
	21:56	21:17			20:09	21	19:41 (WEA06)	18:56	16:47	16:07
5	05:01	05:44			06:38		19:21 (WEA06)	07:31	07:30	08:22
	21:55	21:15			20:07	17	19:38 (WEA06)	18:53	16:45	16:06
6	05:02	05:46			06:40		19:23 (WEA06)	07:33	07:32	08:24
	21:55	21:13			20:04	13	19:36 (WEA06)	18:51	16:43	16:06
7	05:03	05:48			06:42		19:27 (WEA06)	07:35	07:34	08:25
	21:54	21:11			20:02	7	19:34 (WEA06)	18:49	16:41	16:05
8	05:04	05:49			06:44			07:37	07:35	08:26
	21:54	21:09			19:59			18:46	16:40	16:05
9	05:05	05:51			06:45			07:39	07:37	08:28
	21:53	21:07			19:57			18:44	16:38	16:05
10	05:06	05:53			06:47			07:40	07:39	08:29
	21:52	21:05			19:55			18:41	16:36	16:04
11	05:07	05:55			06:49			07:42	07:41	08:30
	21:51	21:03			19:52			18:39	16:34	16:04
12	05:08	05:56		19:37 (WEA06)	06:51			07:44	07:43	08:31
	21:50	21:01	4	19:41 (WEA06)	19:50			18:37	16:33	16:04
13	05:10	05:58		19:32 (WEA06)	06:52			07:46	07:45	08:32
	21:49	20:59	14	19:46 (WEA06)	19:47			18:34	16:31	16:04
14	05:11	06:00		19:30 (WEA06)	06:54			07:48	07:47	08:33
	21:48	20:57	19	19:49 (WEA06)	19:45			18:32	16:30	16:04
15	05:12	06:01		19:27 (WEA06)	06:56		18:42 (WEA05)	07:50	07:49	08:34
	21:47	20:55	23	19:50 (WEA06)	19:42	7	18:49 (WEA05)	18:30	16:28	16:04
16	05:13	06:03		19:26 (WEA06)	06:58		18:38 (WEA05)	07:52	07:51	08:35
	21:46	20:53	26	19:52 (WEA06)	19:40	14	18:52 (WEA05)	18:27	16:26	16:04
17	05:15	06:05		19:25 (WEA06)	06:59		18:36 (WEA05)	07:53	07:52	08:36
	21:45	20:51	28	19:53 (WEA06)	19:37	18	18:54 (WEA05)	18:25	16:25	16:04
18	05:16	06:07		19:23 (WEA06)	07:01		18:33 (WEA05)	07:55	07:54	08:37
	21:44	20:48	30	19:53 (WEA06)	19:35	21	18:54 (WEA05)	18:23	16:24	16:04
19	05:17	06:08		19:22 (WEA06)	07:03		18:32 (WEA05)	07:57	07:56	08:37
	21:42	20:46	32	19:54 (WEA06)	19:32	23	18:55 (WEA05)	18:21	16:22	16:04
20	05:19	06:10		19:21 (WEA06)	07:05		18:31 (WEA05)	07:59	07:58	08:38
	21:41	20:44	34	19:55 (WEA06)	19:30	25	18:56 (WEA05)	18:18	16:21	16:05
21	05:20	06:12		19:20 (WEA06)	07:06		18:31 (WEA05)	08:01	08:00	08:39
	21:40	20:42	35	19:55 (WEA06)	19:28	25	18:56 (WEA05)	18:16	16:19	16:05
22	05:22	06:14		19:19 (WEA06)	07:08		18:29 (WEA05)	08:03	08:02	08:39
	21:38	20:40	36	19:55 (WEA06)	19:25	26	18:55 (WEA05)	18:14	16:18	16:06
23	05:23	06:16		19:19 (WEA06)	07:10		18:29 (WEA05)	08:05	08:03	08:40
	21:37	20:37	37	19:56 (WEA06)	19:23	25	18:54 (WEA05)	18:12	16:17	16:06
24	05:25	06:17		19:18 (WEA06)	07:12		18:29 (WEA05)	08:07	08:05	08:40
	21:35	20:35	37	19:55 (WEA06)	19:20	23	18:52 (WEA05)	18:10	16:16	16:07
25	05:26	06:19		19:18 (WEA06)	07:13		18:29 (WEA05)	07:09	08:07	08:40
	21:34	20:33	37	19:55 (WEA06)	19:18	21	18:50 (WEA05)	17:07	16:15	16:07
26	05:28	06:21		19:18 (WEA06)	07:15		18:28 (WEA05)	07:10	08:08	08:41
	21:32	20:30	37	19:55 (WEA06)	19:15	19	18:47 (WEA05)	17:05	16:14	16:08
27	05:29	06:23		19:17 (WEA06)	07:17		18:29 (WEA05)	07:12	08:10	08:41
	21:31	20:28	37	19:54 (WEA06)	19:13	15	18:44 (WEA05)	17:03	16:13	16:09
28	05:31	06:24		19:17 (WEA06)	07:19		18:29 (WEA05)	07:14	08:12	08:41
	21:29	20:26	37	19:54 (WEA06)	19:10	13	18:42 (WEA05)	17:01	16:12	16:10
29	05:33	06:26		19:17 (WEA06)	07:21		18:31 (WEA05)	07:16	08:13	08:41
	21:28	20:23	37	19:54 (WEA06)	19:08	9	18:40 (WEA05)	16:59	16:11	16:11
30	05:34	06:28		19:17 (WEA06)	07:22		18:32 (WEA05)	07:18	08:15	08:41
	21:26	20:21	35	19:52 (WEA06)	19:05	5	18:37 (WEA05)	16:57	16:10	16:12
31	05:36	06:30		19:17 (WEA06)				07:20		08:41
	21:24	20:19	33	19:50 (WEA06)				16:55		16:13
Sonnenscheinstunden	511	459			382			329	260	234
astr.max.mögl.Beschattung			608			428				
Red.Sonnenscheinwahrsch.			0,42			0,35				
Reduktion Betriebsdauer			0,95			0,95				
Reduktion Windrichtung			0,64			0,65				
Gesamte Reduktion			0,26			0,22				
Met.wahrsch.Beschattung			156			92				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP16 - Kleiner Köven 15A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar			März			April	Mai	Juni
1	08:41	08:11			07:14		17:20 (WEA06)	07:00	05:51	05:02
	16:14	17:05			18:00	13	17:33 (WEA06)	19:58	20:53	21:43
2	08:41	08:10			07:12		17:18 (WEA06)	06:57	05:49	05:01
	16:15	17:07			18:02	16	17:34 (WEA06)	20:00	20:55	21:44
3	08:41	08:08			07:10		17:17 (WEA06)	06:55	05:47	05:00
	16:16	17:09			18:04	20	17:37 (WEA06)	20:02	20:57	21:45
4	08:41	08:06			07:07		17:17 (WEA06)	06:52	05:45	04:59
	16:17	17:11			18:06	22	17:39 (WEA06)	20:04	20:58	21:46
5	08:40	08:04			07:05		17:16 (WEA06)	06:50	05:43	04:58
	16:19	17:13			18:08	25	17:41 (WEA06)	20:05	21:00	21:47
6	08:40	08:03			07:03		17:16 (WEA06)	06:48	05:41	04:58
	16:20	17:15			18:10	27	17:43 (WEA06)	20:07	21:02	21:48
7	08:40	08:01			07:00		17:15 (WEA06)	06:45	05:39	04:57
	16:21	17:17			18:12	29	17:44 (WEA06)	20:09	21:04	21:49
8	08:39	07:59			06:58		17:15 (WEA06)	06:43	05:37	04:56
	16:23	17:19			18:13	29	17:44 (WEA06)	20:11	21:06	21:50
9	08:38	07:57			06:56		17:15 (WEA06)	06:40	05:35	04:56
	16:24	17:21			18:15	29	17:44 (WEA06)	20:13	21:07	21:51
10	08:38	07:55			06:53		17:15 (WEA06)	06:38	05:33	04:55
	16:25	17:23			18:17	28	17:43 (WEA06)	20:15	21:09	21:52
11	08:37	07:53			06:51		17:16 (WEA06)	06:36	05:32	04:55
	16:27	17:25			18:19	26	17:42 (WEA06)	20:16	21:11	21:53
12	08:36	07:51			06:48		17:16 (WEA06)	06:33	05:30	04:55
	16:29	17:27			18:21	25	17:41 (WEA06)	20:18	21:12	21:53
13	08:36	07:49			06:46		17:18 (WEA06)	06:31	05:28	04:54
	16:30	17:29			18:23	22	17:40 (WEA06)	20:20	21:14	21:54
14	08:35	07:47			06:44		17:18 (WEA06)	06:29	05:26	04:54
	16:32	17:31			18:25	19	17:37 (WEA06)	20:22	21:16	21:55
15	08:34	07:45			06:41		17:21 (WEA06)	06:26	05:25	04:54
	16:33	17:33			18:27	14	17:35 (WEA06)	20:24	21:18	21:55
16	08:33	07:43			06:39		17:24 (WEA06)	06:24	05:23	04:54
	16:35	17:35			18:29	6	17:30 (WEA06)	20:26	21:19	21:56
17	08:32	07:41			06:36			06:22	05:21	04:54
	16:37	17:37			18:30			20:27	21:21	21:56
18	08:31	07:39			06:34			06:19	05:20	04:53
	16:38	17:39			18:32			20:29	21:22	21:57
19	08:30	07:37			06:31			06:17	05:18	04:53
	16:40	17:41			18:34			20:31	21:24	21:57
20	08:29	07:34			06:29			06:15	05:17	04:54
	16:42	17:42			18:36			20:33	21:26	21:58
21	08:27	07:32			06:27			06:13	05:15	04:54
	16:44	17:44			18:38			20:35	21:27	21:58
22	08:26	07:30			06:24			06:10	05:14	04:54
	16:46	17:46			18:40			20:37	21:29	21:58
23	08:25	07:28			06:22			06:08	05:12	04:54
	16:47	17:48			18:42			20:38	21:30	21:58
24	08:24	07:26			06:19			06:06	05:11	04:54
	16:49	17:50			18:43			20:40	21:32	21:58
25	08:22	07:23			06:17			06:04	05:10	04:55
	16:51	17:52			18:45			20:42	21:33	21:58
26	08:21	07:21		17:26 (WEA06)	06:14			06:02	05:08	04:55
	16:53	17:54	1	17:27 (WEA06)	18:47			20:44	21:35	21:58
27	08:19	07:19		17:23 (WEA06)	06:12			05:59	05:07	04:56
	16:55	17:56	6	17:29 (WEA06)	18:49			20:46	21:36	21:58
28	08:18	07:17		17:21 (WEA06)	06:09			05:57	05:06	04:56
	16:57	17:58	10	17:31 (WEA06)	18:51			20:48	21:37	21:58
29	08:16				07:07			05:55	05:05	04:57
	16:59				19:53			20:49	21:39	21:58
30	08:15				07:05			05:53	05:04	04:57
	17:01				19:54			20:51	21:40	21:58
31	08:13				07:02				05:03	
	17:03				19:56				21:41	
Sonnenscheinstunden	251	274			367			420	493	509
astr.max.mögl.Beschattung			17			350				
Red.Sonnenscheinwahrsch.			0,24			0,28				
Reduktion Betriebsdauer			0,95			0,95				
Reduktion Windrichtung			0,65			0,65				
Gesamte Reduktion			0,15			0,17				
Met.wahrsch.Beschattung			3			60				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP16 - Kleiner Köven 15A, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September			Oktober			November	Dezember
1	04:58	05:37	06:31			07:24		17:55 (WEA06)	07:22	08:17
	21:57	21:22	20:16			19:03	24	18:19 (WEA06)	16:53	16:09
2	04:59	05:39	06:33			07:26		17:54 (WEA06)	07:24	08:18
	21:57	21:21	20:14			19:01	26	18:20 (WEA06)	16:51	16:08
3	04:59	05:41	06:35			07:28		17:53 (WEA06)	07:26	08:20
	21:57	21:19	20:12			18:58	28	18:21 (WEA06)	16:49	16:07
4	05:00	05:42	06:37			07:30		17:53 (WEA06)	07:28	08:21
	21:56	21:17	20:09			18:56	28	18:21 (WEA06)	16:47	16:07
5	05:01	05:44	06:38			07:31		17:52 (WEA06)	07:30	08:22
	21:56	21:15	20:07			18:53	29	18:21 (WEA06)	16:45	16:06
6	05:02	05:46	06:40			07:33		17:52 (WEA06)	07:32	08:24
	21:55	21:13	20:04			18:51	29	18:21 (WEA06)	16:43	16:06
7	05:03	05:48	06:42			07:35		17:51 (WEA06)	07:34	08:25
	21:54	21:11	20:02			18:49	28	18:19 (WEA06)	16:41	16:05
8	05:04	05:49	06:44			07:37		17:51 (WEA06)	07:35	08:26
	21:54	21:09	19:59			18:46	26	18:17 (WEA06)	16:40	16:05
9	05:05	05:51	06:45			07:39		17:51 (WEA06)	07:37	08:28
	21:53	21:07	19:57			18:44	24	18:15 (WEA06)	16:38	16:04
10	05:06	05:53	06:47			07:40		17:51 (WEA06)	07:39	08:29
	21:52	21:05	19:55			18:41	21	18:12 (WEA06)	16:36	16:04
11	05:07	05:54	06:49			07:42		17:51 (WEA06)	07:41	08:30
	21:51	21:03	19:52			18:39	19	18:10 (WEA06)	16:34	16:04
12	05:08	05:56	06:51			07:44		17:52 (WEA06)	07:43	08:31
	21:50	21:01	19:50			18:37	16	18:08 (WEA06)	16:33	16:04
13	05:10	05:58	06:52			07:46		17:53 (WEA06)	07:45	08:32
	21:49	20:59	19:47			18:34	12	18:05 (WEA06)	16:31	16:04
14	05:11	06:00	06:54			07:48		17:55 (WEA06)	07:47	08:33
	21:48	20:57	19:45			18:32	8	18:03 (WEA06)	16:29	16:04
15	05:12	06:01	06:56			07:50		17:56 (WEA06)	07:49	08:34
	21:47	20:55	19:42			18:30	5	18:01 (WEA06)	16:28	16:04
16	05:13	06:03	06:58			07:52			07:51	08:35
	21:46	20:53	19:40			18:27			16:26	16:04
17	05:15	06:05	06:59			07:53			07:52	08:36
	21:45	20:51	19:37			18:25			16:25	16:04
18	05:16	06:07	07:01			07:55			07:54	08:37
	21:44	20:48	19:35			18:23			16:23	16:04
19	05:17	06:08	07:03			07:57			07:56	08:37
	21:42	20:46	19:32			18:21			16:22	16:04
20	05:19	06:10	07:05			07:59			07:58	08:38
	21:41	20:44	19:30			18:18			16:21	16:05
21	05:20	06:12	07:06			08:01			08:00	08:39
	21:40	20:42	19:28			18:16			16:19	16:05
22	05:22	06:14	07:08			08:03			08:02	08:39
	21:38	20:40	19:25			18:14			16:18	16:06
23	05:23	06:15	07:10			08:05			08:03	08:40
	21:37	20:37	19:23			18:12			16:17	16:06
24	05:25	06:17	07:12			08:07			08:05	08:40
	21:35	20:35	19:20			18:10			16:16	16:07
25	05:26	06:19	07:13			07:09			08:07	08:40
	21:34	20:33	19:18			17:07			16:15	16:07
26	05:28	06:21	07:15			07:10			08:08	08:41
	21:32	20:30	19:15			17:05			16:14	16:08
27	05:29	06:23	07:17			07:12			08:10	08:41
	21:31	20:28	19:13			17:03			16:13	16:09
28	05:31	06:24	07:19		18:03 (WEA06)	07:14			08:12	08:41
	21:29	20:26	19:10	12	18:15 (WEA06)	17:01			16:12	16:10
29	05:33	06:26	07:21		18:00 (WEA06)	07:16			08:13	08:41
	21:28	20:23	19:08	17	18:17 (WEA06)	16:59			16:11	16:11
30	05:34	06:28	07:22		17:58 (WEA06)	07:18			08:15	08:41
	21:26	20:21	19:05	21	18:19 (WEA06)	16:57			16:10	16:11
31	05:36	06:30				07:20				08:41
	21:24	20:19				16:55				16:12
Sonnenscheinstunden	511	459	382			329			260	234
astr.max.mögl.Beschattung				50			323			
Red.Sonnenscheinwahrsch.				0,35			0,29			
Reduktion Betriebsdauer				0,95			0,95			
Reduktion Windrichtung				0,65			0,65			
Gesamte Reduktion				0,22			0,18			
Met.wahrsch.Beschattung				11			59			

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP17 - An der Gösche 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April		Mai		Juni
1	08:41	08:11	07:14		07:00		19:05 (WEA05)	05:51	19:39 (WEA06)	05:02
	16:14	17:05	18:00		19:58	19	19:24 (WEA05)	20:53	22	20:01 (WEA06)	21:43
2	08:41	08:10	07:12		06:57		19:06 (WEA05)	05:49		19:41 (WEA06)	05:01
	16:15	17:07	18:02		20:00	17	19:23 (WEA05)	20:55	19	20:00 (WEA06)	21:44
3	08:41	08:08	07:10		06:55		19:07 (WEA05)	05:47		19:43 (WEA06)	05:00
	16:16	17:09	18:04		20:02	13	19:20 (WEA05)	20:57	16	19:59 (WEA06)	21:45
4	08:41	08:06	07:07		06:52		19:11 (WEA05)	05:45		19:45 (WEA06)	04:59
	16:17	17:11	18:06		20:04	5	19:16 (WEA05)	20:58	11	19:56 (WEA06)	21:46
5	08:40	08:04	07:05		06:50			05:43			04:59
	16:19	17:13	18:08		20:05			21:00			21:47
6	08:40	08:03	07:03		06:48			05:41			04:58
	16:20	17:15	18:10		20:07			21:02			21:48
7	08:40	08:01	07:00		06:45			05:39			04:57
	16:21	17:17	18:12		20:09			21:04			21:49
8	08:39	07:59	06:58		06:43			05:37			04:57
	16:23	17:19	18:13		20:11			21:05			21:50
9	08:38	07:57	06:56		06:40			05:35			04:56
	16:24	17:21	18:15		20:13			21:07			21:51
10	08:38	07:55	06:53		06:38			05:33			04:55
	16:26	17:23	18:17		20:15			21:09			21:52
11	08:37	07:53	06:51		06:36			05:32			04:55
	16:27	17:25	18:19		20:16			21:11			21:53
12	08:36	07:51	06:48		06:33			05:30			04:55
	16:29	17:27	18:21		20:18			21:12			21:53
13	08:36	07:49	06:46		06:31		19:48 (WEA06)	05:28			04:54
	16:30	17:29	18:23		20:20	5	19:53 (WEA06)	21:14			21:54
14	08:35	07:47	06:44		06:29		19:45 (WEA06)	05:26			04:54
	16:32	17:31	18:25		20:22	10	19:55 (WEA06)	21:16			21:55
15	08:34	07:45	06:41		06:26		19:42 (WEA06)	05:25			04:54
	16:33	17:33	18:27		20:24	14	19:56 (WEA06)	21:18			21:55
16	08:33	07:43	06:39		06:24		19:41 (WEA06)	05:23			04:54
	16:35	17:35	18:29		20:26	17	19:58 (WEA06)	21:19			21:56
17	08:32	07:41	06:36		06:22		19:40 (WEA06)	05:21			04:54
	16:37	17:37	18:30		20:27	20	20:00 (WEA06)	21:21			21:56
18	08:31	07:39	06:34		06:19		19:39 (WEA06)	05:20			04:54
	16:39	17:39	18:32		20:29	23	20:02 (WEA06)	21:22			21:57
19	08:30	07:37	06:31		06:17		19:38 (WEA06)	05:18			04:54
	16:40	17:41	18:34		20:31	25	20:03 (WEA06)	21:24			21:57
20	08:29	07:34	06:29		06:15		19:37 (WEA06)	05:17			04:54
	16:42	17:43	18:36		20:33	27	20:04 (WEA06)	21:26			21:58
21	08:27	07:32	06:27		06:13		19:37 (WEA06)	05:15			04:54
	16:44	17:44	18:38		20:35	29	20:06 (WEA06)	21:27			21:58
22	08:26	07:30	06:24	18:10 (WEA05)	06:10		19:37 (WEA06)	05:14			04:54
	16:46	17:46	18:40	4 18:14 (WEA05)	20:37	30	20:07 (WEA06)	21:29			21:58
23	08:25	07:28	06:22	18:08 (WEA05)	06:08		19:36 (WEA06)	05:12			04:54
	16:48	17:48	18:42	7 18:15 (WEA05)	20:38	31	20:07 (WEA06)	21:30			21:58
24	08:24	07:26	06:19	18:07 (WEA05)	06:06		19:36 (WEA06)	05:11			04:54
	16:49	17:50	18:43	10 18:17 (WEA05)	20:40	31	20:07 (WEA06)	21:32			21:58
25	08:22	07:23	06:17	18:05 (WEA05)	06:04		19:37 (WEA06)	05:10			04:55
	16:51	17:52	18:45	14 18:19 (WEA05)	20:42	30	20:07 (WEA06)	21:33			21:58
26	08:21	07:21	06:14	18:05 (WEA05)	06:02		19:36 (WEA06)	05:08			04:55
	16:53	17:54	18:47	16 18:21 (WEA05)	20:44	29	20:05 (WEA06)	21:35			21:58
27	08:19	07:19	06:12	18:04 (WEA05)	05:59		19:36 (WEA06)	05:07			04:56
	16:55	17:56	18:49	18 18:22 (WEA05)	20:46	29	20:05 (WEA06)	21:36			21:58
28	08:18	07:17	06:09	18:04 (WEA05)	05:57		19:37 (WEA06)	05:06			04:56
	16:57	17:58	18:51	20 18:24 (WEA05)	20:48	27	20:04 (WEA06)	21:37			21:58
29	08:16		07:07	19:03 (WEA05)	05:55		19:37 (WEA06)	05:05			04:57
	16:59		19:53	23 19:26 (WEA05)	20:49	26	20:03 (WEA06)	21:39			21:58
30	08:15		07:05	19:04 (WEA05)	05:53		19:38 (WEA06)	05:04			04:57
	17:01		19:54	22 19:26 (WEA05)	20:51	24	20:02 (WEA06)	21:40			21:58
31	08:13		07:02	19:05 (WEA05)				05:03			
	17:03		19:56	21 19:26 (WEA05)				21:41			
Sonnenscheinstunden	251	274	367		420			493			509
astr.max.mögl.Beschattung				155		481			68		
Red.Sonnenscheinwahrsch.				0,28		0,37			0,43		
Reduktion Betriebsdauer				0,95		0,95			0,95		
Reduktion Windrichtung				0,65		0,62			0,62		
Gesamte Reduktion				0,17		0,22			0,25		
Met.wahrsch.Beschattung				27		107			17		

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP17 - An der Gösche 10, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August		September		Oktober	November	Dezember
1	04:58	05:38		06:31		07:24	07:22	08:17
	21:57	21:22		20:16		19:03	16:53	16:09
2	04:59	05:39		06:33		07:26	07:24	08:18
	21:57	21:21		20:14		19:01	16:51	16:08
3	05:00	05:41		06:35		07:28	07:26	08:20
	21:56	21:19		20:12		18:58	16:49	16:08
4	05:00	05:43		06:37		07:30	07:28	08:21
	21:56	21:17		20:09		18:56	16:47	16:07
5	05:01	05:44		06:38		07:31	07:30	08:22
	21:55	21:15		20:07		18:53	16:45	16:06
6	05:02	05:46		06:40		07:33	07:32	08:24
	21:55	21:13		20:04		18:51	16:43	16:06
7	05:03	05:48		06:42		07:35	07:34	08:25
	21:54	21:11		20:02		18:49	16:41	16:05
8	05:04	05:49		19:57 (WEA06)	06:44	19:06 (WEA05)	07:37	07:35	08:26
	21:54	21:09	5	20:02 (WEA06)	19:59	4	19:10 (WEA05)	18:46	16:40	16:05
9	05:05	05:51		19:53 (WEA06)	06:45		19:02 (WEA05)	07:39	07:37	08:28
	21:53	21:07	13	20:06 (WEA06)	19:57	12	19:14 (WEA05)	18:44	16:38	16:05
10	05:06	05:53		19:50 (WEA06)	06:47		19:00 (WEA05)	07:40	07:39	08:29
	21:52	21:05	18	20:08 (WEA06)	19:55	16	19:16 (WEA05)	18:41	16:36	16:04
11	05:07	05:55		19:49 (WEA06)	06:49		18:57 (WEA05)	07:42	07:41	08:30
	21:51	21:03	20	20:09 (WEA06)	19:52	19	19:16 (WEA05)	18:39	16:34	16:04
12	05:08	05:56		19:47 (WEA06)	06:51		18:56 (WEA05)	07:44	07:43	08:31
	21:50	21:01	23	20:10 (WEA06)	19:50	21	19:17 (WEA05)	18:37	16:33	16:04
13	05:10	05:58		19:46 (WEA06)	06:52		18:55 (WEA05)	07:46	07:45	08:32
	21:49	20:59	25	20:11 (WEA06)	19:47	22	19:17 (WEA05)	18:34	16:31	16:04
14	05:11	06:00		19:45 (WEA06)	06:54		18:55 (WEA05)	07:48	07:47	08:33
	21:48	20:57	27	20:12 (WEA06)	19:45	22	19:17 (WEA05)	18:32	16:30	16:04
15	05:12	06:01		19:44 (WEA06)	06:56		18:53 (WEA05)	07:50	07:49	08:34
	21:47	20:55	28	20:12 (WEA06)	19:42	21	19:14 (WEA05)	18:30	16:28	16:04
16	05:13	06:03		19:44 (WEA06)	06:58		18:53 (WEA05)	07:52	07:51	08:35
	21:46	20:53	29	20:13 (WEA06)	19:40	19	19:12 (WEA05)	18:27	16:26	16:04
17	05:15	06:05		19:43 (WEA06)	06:59		18:53 (WEA05)	07:53	07:52	08:36
	21:45	20:51	30	20:13 (WEA06)	19:37	17	19:10 (WEA05)	18:25	16:25	16:04
18	05:16	06:07		19:42 (WEA06)	07:01		18:53 (WEA05)	07:55	07:54	08:37
	21:44	20:48	31	20:13 (WEA06)	19:35	14	19:07 (WEA05)	18:23	16:24	16:04
19	05:17	06:08		19:42 (WEA06)	07:03		18:53 (WEA05)	07:57	07:56	08:37
	21:42	20:46	31	20:13 (WEA06)	19:32	11	19:04 (WEA05)	18:21	16:22	16:04
20	05:19	06:10		19:42 (WEA06)	07:05		18:54 (WEA05)	07:59	07:58	08:38
	21:41	20:44	31	20:13 (WEA06)	19:30	8	19:02 (WEA05)	18:18	16:21	16:05
21	05:20	06:12		19:41 (WEA06)	07:06		18:55 (WEA05)	08:01	08:00	08:39
	21:40	20:42	31	20:12 (WEA06)	19:28	5	19:00 (WEA05)	18:16	16:19	16:05
22	05:22	06:14		19:42 (WEA06)	07:08		18:56 (WEA05)	08:03	08:02	08:39
	21:38	20:40	29	20:11 (WEA06)	19:25	1	18:57 (WEA05)	18:14	16:18	16:06
23	05:23	06:15		19:42 (WEA06)	07:10			08:05	08:03	08:40
	21:37	20:37	27	20:09 (WEA06)	19:23			18:12	16:17	16:06
24	05:25	06:17		19:41 (WEA06)	07:12			08:07	08:05	08:40
	21:35	20:35	25	20:06 (WEA06)	19:20			18:10	16:16	16:07
25	05:26	06:19		19:42 (WEA06)	07:13			07:09	08:07	08:40
	21:34	20:33	22	20:04 (WEA06)	19:18			17:07	16:15	16:07
26	05:28	06:21		19:43 (WEA06)	07:15			07:10	08:08	08:41
	21:32	20:30	19	20:02 (WEA06)	19:15			17:05	16:14	16:08
27	05:29	06:23		19:43 (WEA06)	07:17			07:12	08:10	08:41
	21:31	20:28	16	19:59 (WEA06)	19:13			17:03	16:13	16:09
28	05:31	06:24		19:44 (WEA06)	07:19			07:14	08:12	08:41
	21:29	20:26	13	19:57 (WEA06)	19:10			17:01	16:12	16:10
29	05:33	06:26		19:46 (WEA06)	07:21			07:16	08:13	08:41
	21:28	20:23	9	19:55 (WEA06)	19:08			16:59	16:11	16:11
30	05:34	06:28		19:48 (WEA06)	07:22			07:18	08:15	08:41
	21:26	20:21	4	19:52 (WEA06)	19:05			16:57	16:10	16:12
31	05:36	06:30						07:20		08:41
	21:24	20:19						16:55		16:12
Sonnenscheinstunden	511	459			382			329	260	234
astr.max.mögl.Beschattung			506		212					
Red.Sonnenscheinwahrsch.			0,42		0,35					
Reduktion Betriebsdauer			0,95		0,95					
Reduktion Windrichtung			0,62		0,65					
Gesamte Reduktion			0,25		0,22					
Met.wahrsch.Beschattung			127		46					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP18 - Wischhofstraße 17a, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März			April			Mai			Juni		
1	08:41		08:11		07:14			07:00			05:51			05:02		20:26 (WEA06)
	16:14		17:05		18:00			19:58			20:53			21:43	36	21:02 (WEA06)
2	08:41		08:10		07:12			06:57			05:49			05:01		20:26 (WEA06)
	16:15		17:07		18:02			20:00			20:55			21:44	36	21:02 (WEA06)
3	08:41		08:08		07:10			06:55			05:47			05:00		20:26 (WEA06)
	16:16		17:09		18:04			20:02			20:57			21:45	36	21:02 (WEA06)
4	08:41		08:06		07:07			06:52			05:45			04:59		20:26 (WEA06)
	16:17		17:11		18:06			20:04			20:58			21:46	36	21:02 (WEA06)
5	08:40		08:04		07:05			06:50			05:43			04:59		20:27 (WEA06)
	16:19		17:13		18:08			20:05			21:00			21:47	36	21:03 (WEA06)
6	08:40		08:03		07:03			06:48			05:41			04:58		20:27 (WEA06)
	16:20		17:15		18:10			20:07			21:02			21:48	36	21:03 (WEA06)
7	08:40		08:01		07:00			06:45		19:39 (WEA05)	05:39			04:57		20:27 (WEA06)
	16:21		17:17		18:12			20:09	3	19:42 (WEA05)	21:04			21:49	35	21:02 (WEA06)
8	08:39		07:59		06:58			06:43		19:36 (WEA05)	05:37			04:57		20:27 (WEA06)
	16:23		17:19		18:14			20:11	7	19:43 (WEA05)	21:05			21:50	36	21:03 (WEA06)
9	08:38		07:57		06:56			06:40		19:35 (WEA05)	05:35			04:56		20:28 (WEA06)
	16:24		17:21		18:15			20:13	10	19:45 (WEA05)	21:07			21:51	36	21:04 (WEA06)
10	08:38		07:55		06:53			06:38		19:33 (WEA05)	05:33			04:55		20:28 (WEA06)
	16:26		17:23		18:17			20:15	15	19:48 (WEA05)	21:09			21:52	35	21:03 (WEA06)
11	08:37		07:53		06:51		17:52 (WEA09)	06:36		19:32 (WEA05)	05:32			04:55		20:28 (WEA06)
	16:27		17:25		18:19	1	17:53 (WEA09)	20:16	17	19:49 (WEA05)	21:11			21:53	35	21:03 (WEA06)
12	08:36		07:51		06:48		17:49 (WEA09)	06:33		19:31 (WEA05)	05:30		20:39 (WEA06)	04:55		20:29 (WEA06)
	16:29		17:27		18:21	5	17:54 (WEA09)	20:18	20	19:51 (WEA05)	21:12	2	20:41 (WEA06)	21:53	35	21:04 (WEA06)
13	08:36		07:49		06:46		17:48 (WEA09)	06:31		19:31 (WEA05)	05:28		20:35 (WEA06)	04:54		20:28 (WEA06)
	16:30		17:29		18:23	9	17:57 (WEA09)	20:20	22	19:53 (WEA05)	21:14	7	20:42 (WEA06)	21:54	35	21:03 (WEA06)
14	08:35		07:47		06:44		17:46 (WEA09)	06:29		19:30 (WEA05)	05:26		20:34 (WEA06)	04:54		20:29 (WEA06)
	16:32		17:31		18:25	12	17:58 (WEA09)	20:22	25	19:55 (WEA05)	21:16	10	20:44 (WEA06)	21:55	35	21:04 (WEA06)
15	08:34		07:45		06:41		17:46 (WEA09)	06:26		19:29 (WEA05)	05:25		20:32 (WEA06)	04:54		20:29 (WEA06)
	16:33		17:33		18:27	14	18:00 (WEA09)	20:24	27	19:56 (WEA05)	21:18	14	20:46 (WEA06)	21:55	35	21:04 (WEA06)
16	08:33		07:43		06:39		17:45 (WEA09)	06:24		19:29 (WEA05)	05:23		20:31 (WEA06)	04:54		20:29 (WEA06)
	16:35		17:35		18:29	17	18:02 (WEA09)	20:26	28	19:57 (WEA05)	21:19	17	20:48 (WEA06)	21:56	35	21:04 (WEA06)
17	08:32		07:41		06:36		17:45 (WEA09)	06:22		19:30 (WEA05)	05:21		20:29 (WEA06)	04:54		20:30 (WEA06)
	16:37		17:37		18:30	19	18:04 (WEA09)	20:27	26	19:56 (WEA05)	21:21	19	20:48 (WEA06)	21:56	34	21:04 (WEA06)
18	08:31		07:39		06:34		17:44 (WEA09)	06:19		19:30 (WEA05)	05:20		20:29 (WEA06)	04:54		20:30 (WEA06)
	16:39		17:39		18:32	21	18:05 (WEA09)	20:29	26	19:56 (WEA05)	21:22	21	20:50 (WEA06)	21:57	34	21:04 (WEA06)
19	08:30		07:37		06:31		17:44 (WEA09)	06:17		19:30 (WEA05)	05:18		20:28 (WEA06)	04:54		20:30 (WEA06)
	16:40		17:41		18:34	23	18:07 (WEA09)	20:31	24	19:54 (WEA05)	21:24	23	20:51 (WEA06)	21:57	35	21:05 (WEA06)
20	08:29		07:34		06:29		17:45 (WEA09)	06:15		19:30 (WEA05)	05:17		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:42		17:43		18:36	22	18:07 (WEA09)	20:33	24	19:54 (WEA05)	21:26	26	20:53 (WEA06)	21:58	35	21:05 (WEA06)
21	08:27		07:32		06:27		17:45 (WEA09)	06:13		19:31 (WEA05)	05:15		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:44		17:44		18:38	20	18:05 (WEA09)	20:35	22	19:53 (WEA05)	21:27	28	20:55 (WEA06)	21:58	35	21:05 (WEA06)
22	08:26		07:30		06:24		17:46 (WEA09)	06:10		19:32 (WEA05)	05:14		20:27 (WEA06)	04:54		20:31 (WEA06)
	16:46		17:46		18:40	18	18:04 (WEA09)	20:37	19	19:51 (WEA05)	21:29	29	20:56 (WEA06)	21:58	35	21:06 (WEA06)
23	08:25		07:28		06:22		17:47 (WEA09)	06:08		19:34 (WEA05)	05:12		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:48		17:48		18:42	15	18:02 (WEA09)	20:38	16	19:50 (WEA05)	21:30	31	20:57 (WEA06)	21:58	35	21:06 (WEA06)
24	08:24		07:26		06:19		17:50 (WEA09)	06:06		19:36 (WEA05)	05:11		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:49		17:50		18:43	9	17:59 (WEA09)	20:40	11	19:47 (WEA05)	21:32	32	20:58 (WEA06)	21:58	35	21:06 (WEA06)
25	08:22		07:23		06:17			06:04			05:10		20:26 (WEA06)	04:55		20:32 (WEA06)
	16:51		17:52		18:45			20:42			21:33	34	21:00 (WEA06)	21:58	34	21:06 (WEA06)
26	08:21		07:21		06:14			06:02			05:09		20:26 (WEA06)	04:55		20:32 (WEA06)
	16:53		17:54		18:47			20:44			21:35	35	21:01 (WEA06)	21:58	34	21:06 (WEA06)
27	08:19		07:19		06:12			05:59			05:07		20:26 (WEA06)	04:56		20:32 (WEA06)
	16:55		17:56		18:49			20:46			21:36	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
28	08:18		07:17		06:09			05:57			05:06		20:26 (WEA06)	04:56		20:32 (WEA06)
	16:57		17:58		18:51			20:48			21:37	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
29	08:16				07:07			05:55			05:05		20:26 (WEA06)	04:57		20:32 (WEA06)
	16:59				19:53			20:49			21:39	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
30	08:15				07:05			05:53			05:04		20:26 (WEA06)	04:57		20:32 (WEA06)
	17:01				19:54			20:51			21:40	35	21:01 (WEA06)	21:58	35	21:07 (WEA06)
31	08:13				07:02						05:03		20:26 (WEA06)			
	17:03				19:56						21:41	36	21:02 (WEA06)			
Sonnenscheinstunden	251		274		367			420			493			509		
astr.max.mögl.Beschattung						205			342			504			1054	
Red.Sonnenscheinwahrsch.						0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,65			0,63			0,62			0,62	
Gesamte Reduktion						0,17			0,22			0,25			0,23	
Met.wahrsch.Beschattung						35			77			128			241	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP18 - Wischhofstraße 17a, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		20:32 (WEA06)	05:38			06:31		19:32 (WEA05)	07:24		18:27 (WEA09)	07:22	08:17
	21:57	36	21:08 (WEA06)	21:22			20:16	16	19:48 (WEA05)	19:03	7	18:34 (WEA09)	16:53	16:09
2	04:59		20:33 (WEA06)	05:39			06:33		19:31 (WEA05)	07:26		18:29 (WEA09)	07:24	08:18
	21:57	35	21:08 (WEA06)	21:21			20:14	14	19:45 (WEA05)	19:01	3	18:32 (WEA09)	16:51	16:08
3	05:00		20:32 (WEA06)	05:41			06:35		19:33 (WEA05)	07:28			07:26	08:20
	21:56	36	21:08 (WEA06)	21:19			20:12	10	19:43 (WEA05)	18:58			16:49	16:08
4	05:00		20:33 (WEA06)	05:43			06:37		19:34 (WEA05)	07:30			07:28	08:21
	21:56	35	21:08 (WEA06)	21:17			20:09	7	19:41 (WEA05)	18:56			16:47	16:07
5	05:01		20:33 (WEA06)	05:44			06:38		19:35 (WEA05)	07:31			07:30	08:22
	21:55	36	21:09 (WEA06)	21:15			20:07	3	19:38 (WEA05)	18:53			16:45	16:06
6	05:02		20:33 (WEA06)	05:46			06:40			07:33			07:32	08:24
	21:55	36	21:09 (WEA06)	21:13			20:04			18:51			16:43	16:06
7	05:03		20:33 (WEA06)	05:48			06:42			07:35			07:34	08:25
	21:54	36	21:09 (WEA06)	21:11			20:02			18:49			16:41	16:05
8	05:04		20:34 (WEA06)	05:49			06:44			07:37			07:35	08:26
	21:54	36	21:10 (WEA06)	21:09			19:59			18:46			16:40	16:05
9	05:05		20:34 (WEA06)	05:51			06:45			07:39			07:37	08:28
	21:53	36	21:10 (WEA06)	21:07			19:57			18:44			16:38	16:05
10	05:06		20:34 (WEA06)	05:53			06:47			07:40			07:39	08:29
	21:52	36	21:10 (WEA06)	21:05			19:55			18:41			16:36	16:04
11	05:07		20:34 (WEA06)	05:55			06:49			07:42			07:41	08:30
	21:51	36	21:10 (WEA06)	21:03			19:52			18:39			16:34	16:04
12	05:08		20:34 (WEA06)	05:56			06:51			07:44			07:43	08:31
	21:50	36	21:10 (WEA06)	21:01			19:50			18:37			16:33	16:04
13	05:10		20:34 (WEA06)	05:58			06:52			07:46			07:45	08:32
	21:49	36	21:10 (WEA06)	20:59			19:47			18:34			16:31	16:04
14	05:11		20:34 (WEA06)	06:00			06:54			07:48			07:47	08:33
	21:48	36	21:10 (WEA06)	20:57			19:45			18:32			16:30	16:04
15	05:12		20:34 (WEA06)	06:01			06:56			07:50			07:49	08:34
	21:47	36	21:10 (WEA06)	20:55			19:42			18:30			16:28	16:04
16	05:13		20:34 (WEA06)	06:03			06:58			07:52			07:51	08:35
	21:46	35	21:09 (WEA06)	20:53			19:40			18:27			16:26	16:04
17	05:15		20:35 (WEA06)	06:05			06:59			07:53			07:52	08:36
	21:45	35	21:10 (WEA06)	20:51			19:37			18:25			16:25	16:04
18	05:16		20:35 (WEA06)	06:07		19:47 (WEA05)	07:01			07:55			07:54	08:37
	21:44	35	21:10 (WEA06)	20:48	1	19:48 (WEA05)	19:35			18:23			16:24	16:04
19	05:18		20:35 (WEA06)	06:08		19:41 (WEA05)	07:03		18:37 (WEA09)	07:57			07:56	08:37
	21:42	34	21:09 (WEA06)	20:46	12	19:53 (WEA05)	19:32	8	18:45 (WEA09)	18:21			16:22	16:04
20	05:19		20:36 (WEA06)	06:10		19:39 (WEA05)	07:05		18:34 (WEA09)	07:59			07:58	08:38
	21:41	32	21:08 (WEA06)	20:44	17	19:56 (WEA05)	19:30	14	18:48 (WEA09)	18:18			16:21	16:05
21	05:20		20:37 (WEA06)	06:12		19:37 (WEA05)	07:06		18:32 (WEA09)	08:01			08:00	08:39
	21:40	30	21:07 (WEA06)	20:42	19	19:56 (WEA05)	19:28	17	18:49 (WEA09)	18:16			16:19	16:05
22	05:22		20:37 (WEA06)	06:14		19:36 (WEA05)	07:08		18:30 (WEA09)	08:03			08:02	08:39
	21:38	28	21:05 (WEA06)	20:40	21	19:57 (WEA05)	19:25	19	18:49 (WEA09)	18:14			16:18	16:06
23	05:23		20:38 (WEA06)	06:16		19:35 (WEA05)	07:10		18:29 (WEA09)	08:05			08:03	08:40
	21:37	26	21:04 (WEA06)	20:37	23	19:58 (WEA05)	19:23	21	18:50 (WEA09)	18:12			16:17	16:06
24	05:25		20:38 (WEA06)	06:17		19:33 (WEA05)	07:12		18:28 (WEA09)	08:07			08:05	08:40
	21:35	25	21:03 (WEA06)	20:35	25	19:58 (WEA05)	19:20	23	18:51 (WEA09)	18:10			16:16	16:07
25	05:26		20:39 (WEA06)	06:19		19:33 (WEA05)	07:13		18:28 (WEA09)	07:09			08:07	08:40
	21:34	23	21:02 (WEA06)	20:33	26	19:59 (WEA05)	19:18	22	18:50 (WEA09)	17:07			16:15	16:07
26	05:28		20:40 (WEA06)	06:21		19:32 (WEA05)	07:15		18:26 (WEA09)	07:10			08:08	08:41
	21:32	20	21:00 (WEA06)	20:30	27	19:59 (WEA05)	19:15	21	18:47 (WEA09)	17:05			16:14	16:08
27	05:29		20:40 (WEA06)	06:23		19:31 (WEA05)	07:17		18:26 (WEA09)	07:12			08:10	08:41
	21:31	18	20:58 (WEA06)	20:28	27	19:58 (WEA05)	19:13	18	18:44 (WEA09)	17:03			16:13	16:09
28	05:31		20:42 (WEA06)	06:24		19:31 (WEA05)	07:19		18:26 (WEA09)	07:14			08:12	08:41
	21:29	15	20:57 (WEA06)	20:26	26	19:57 (WEA05)	19:10	16	18:42 (WEA09)	17:01			16:12	16:10
29	05:33		20:43 (WEA06)	06:26		19:31 (WEA05)	07:21		18:27 (WEA09)	07:16			08:13	08:41
	21:28	12	20:55 (WEA06)	20:23	24	19:55 (WEA05)	19:08	13	18:40 (WEA09)	16:59			16:11	16:11
30	05:34		20:45 (WEA06)	06:28		19:31 (WEA05)	07:22		18:27 (WEA09)	07:18			08:15	08:41
	21:26	9	20:54 (WEA06)	20:21	21	19:52 (WEA05)	19:05	10	18:37 (WEA09)	16:57			16:10	16:12
31	05:36		20:47 (WEA06)	06:30		19:31 (WEA05)				07:20				08:41
	21:24	5	20:52 (WEA06)	20:19	19	19:50 (WEA05)				16:55				16:13
Sonnenscheinstunden	511			459			382			329			260	234
astr.max.mögl.Beschattung		920		288				252			10			
Red.Sonnenscheinwahrsch.		0,38		0,42				0,35			0,29			
Reduktion Betriebsdauer		0,95		0,95				0,95			0,95			
Reduktion Windrichtung		0,62		0,63				0,65			0,65			
Gesamte Reduktion		0,22		0,26				0,22			0,18			
Met.wahrsch.Beschattung		206		74				54			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP19 - Wischhofstraße 15, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51			05:02		20:25 (WEA06)
	16:14	17:05	18:00	19:58			20:53			21:43	33	20:58 (WEA06)
2	08:41	08:10	07:12	06:57			05:49			05:01		20:26 (WEA06)
	16:15	17:07	18:02	20:00			20:55			21:44	33	20:59 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:26 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	33	20:59 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:26 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	32	20:58 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:27 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	32	20:59 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:27 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	32	20:59 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:26 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	32	20:58 (WEA06)
8	08:39	07:59	06:58	06:43		19:38 (WEA05)	05:37			04:57		20:27 (WEA06)
	16:23	17:19	18:14	20:11	5	19:43 (WEA05)	21:05			21:50	32	20:59 (WEA06)
9	08:38	07:57	06:56	06:40		19:37 (WEA05)	05:35			04:56		20:28 (WEA06)
	16:24	17:21	18:15	20:13	8	19:45 (WEA05)	21:07			21:51	31	20:59 (WEA06)
10	08:38	07:55	06:53	06:38		19:36 (WEA05)	05:33		20:37 (WEA06)	04:55		20:28 (WEA06)
	16:26	17:23	18:17	20:15	12	19:48 (WEA05)	21:09	1	20:38 (WEA06)	21:52	31	20:59 (WEA06)
11	08:37	07:53	06:51	06:36		19:34 (WEA05)	05:32		20:34 (WEA06)	04:55		20:28 (WEA06)
	16:27	17:25	18:19	20:16	15	19:49 (WEA05)	21:11	6	20:40 (WEA06)	21:53	31	20:59 (WEA06)
12	08:36	07:51	06:48	06:33		19:33 (WEA05)	05:30		20:32 (WEA06)	04:55		20:29 (WEA06)
	16:29	17:27	18:21	20:18	18	19:51 (WEA05)	21:12	9	20:41 (WEA06)	21:53	30	20:59 (WEA06)
13	08:36	07:49	06:46	06:31		19:33 (WEA05)	05:28		20:30 (WEA06)	04:54		20:29 (WEA06)
	16:30	17:29	18:23	20:20	20	19:53 (WEA05)	21:14	12	20:42 (WEA06)	21:54	30	20:59 (WEA06)
14	08:35	07:47	06:44	06:29		19:33 (WEA05)	05:26		20:29 (WEA06)	04:54		20:29 (WEA06)
	16:32	17:31	18:25	20:22	22	19:55 (WEA05)	21:16	15	20:44 (WEA06)	21:55	30	20:59 (WEA06)
15	08:34	07:45	06:41	06:26		19:31 (WEA05)	05:25		20:28 (WEA06)	04:54		20:29 (WEA06)
	16:33	17:33	18:27	20:24	25	19:56 (WEA05)	21:18	18	20:46 (WEA06)	21:55	30	20:59 (WEA06)
16	08:33	07:43	06:39	06:24		19:32 (WEA05)	05:23		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:35	17:35	18:29	20:26	25	19:57 (WEA05)	21:19	21	20:48 (WEA06)	21:56	29	20:59 (WEA06)
17	08:32	07:41	06:36	06:22		19:32 (WEA05)	05:21		20:26 (WEA06)	04:54		20:30 (WEA06)
	16:37	17:37	18:30	20:27	25	19:57 (WEA05)	21:21	22	20:48 (WEA06)	21:56	30	21:00 (WEA06)
18	08:31	07:39	06:34	06:19		19:32 (WEA05)	05:20		20:26 (WEA06)	04:54		20:30 (WEA06)
	16:39	17:39	18:32	20:29	25	19:57 (WEA05)	21:22	24	20:50 (WEA06)	21:57	30	21:00 (WEA06)
19	08:30	07:37	06:31	06:17		19:32 (WEA05)	05:18		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:40	17:41	18:34	20:31	23	19:55 (WEA05)	21:24	26	20:51 (WEA06)	21:57	29	21:00 (WEA06)
20	08:29	07:34	06:29	06:15		19:33 (WEA05)	05:17		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:42	17:43	18:36	20:33	21	19:54 (WEA05)	21:26	28	20:53 (WEA06)	21:58	29	21:00 (WEA06)
21	08:27	07:32	06:27	06:13		19:34 (WEA05)	05:15		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:44	17:44	18:38	20:35	19	19:53 (WEA05)	21:27	30	20:55 (WEA06)	21:58	29	21:00 (WEA06)
22	08:26	07:30	06:24	06:10		19:35 (WEA05)	05:14		20:25 (WEA06)	04:54		20:32 (WEA06)
	16:46	17:46	18:40	20:37	17	19:52 (WEA05)	21:29	31	20:56 (WEA06)	21:58	29	21:01 (WEA06)
23	08:25	07:28	06:22	06:08		19:37 (WEA05)	05:12		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:48	17:48	18:42	20:38	13	19:50 (WEA05)	21:30	33	20:57 (WEA06)	21:58	29	21:01 (WEA06)
24	08:24	07:26	06:19	06:06		19:40 (WEA05)	05:11		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:49	17:50	18:43	20:40	6	19:46 (WEA05)	21:32	33	20:57 (WEA06)	21:58	29	21:01 (WEA06)
25	08:22	07:23	06:17	06:04			05:10		20:24 (WEA06)	04:55		20:32 (WEA06)
	16:51	17:52	18:45	20:42			21:33	34	20:58 (WEA06)	21:58	30	21:02 (WEA06)
26	08:21	07:21	06:14	06:02			05:09		20:24 (WEA06)	04:55		20:32 (WEA06)
	16:53	17:54	18:47	20:44			21:35	34	20:58 (WEA06)	21:58	29	21:01 (WEA06)
27	08:19	07:19	06:12	05:59			05:07		20:24 (WEA06)	04:56		20:33 (WEA06)
	16:55	17:56	18:49	20:46			21:36	34	20:58 (WEA06)	21:58	29	21:02 (WEA06)
28	08:18	07:17	06:09	05:57			05:06		20:24 (WEA06)	04:56		20:32 (WEA06)
	16:57	17:58	18:51	20:48			21:37	34	20:58 (WEA06)	21:58	30	21:02 (WEA06)
29	08:16		07:07	05:55			05:05		20:25 (WEA06)	04:57		20:33 (WEA06)
	16:59		19:53	20:49			21:39	33	20:58 (WEA06)	21:58	30	21:03 (WEA06)
30	08:15		07:05	05:53			05:04		20:25 (WEA06)	04:57		20:32 (WEA06)
	17:01		19:54	20:51			21:40	33	20:58 (WEA06)	21:58	31	21:03 (WEA06)
31	08:13		07:02				05:03		20:25 (WEA06)			
	17:03		19:56				21:41	33	20:58 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					299			544			914	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,63			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					67			139			209	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP19 - Wischhofstraße 15, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		20:33 (WEA06)	05:38	20:43 (WEA06)	06:31	19:34 (WEA05)	07:24	07:22	08:17
	21:57	30	21:03 (WEA06)	21:22	8	20:51 (WEA06)	20:16	14	19:48 (WEA05)	19:03	16:53	16:09
2	04:59		20:33 (WEA06)	05:39	20:44 (WEA06)	06:33	19:34 (WEA05)	07:26	07:24	08:18
	21:57	31	21:04 (WEA06)	21:21	5	20:49 (WEA06)	20:14	11	19:45 (WEA05)	19:01	16:51	16:08
3	05:00		20:32 (WEA06)	05:41			06:35		19:35 (WEA05)	07:28	07:26	08:20
	21:56	31	21:03 (WEA06)	21:19			20:12	8	19:43 (WEA05)	18:58	16:49	16:08
4	05:00		20:33 (WEA06)	05:43			06:37		19:36 (WEA05)	07:30	07:28	08:21
	21:56	31	21:04 (WEA06)	21:17			20:09	5	19:41 (WEA05)	18:56	16:47	16:07
5	05:01		20:33 (WEA06)	05:44			06:38			07:31	07:30	08:22
	21:55	32	21:05 (WEA06)	21:15			20:07			18:53	16:45	16:06
6	05:02		20:33 (WEA06)	05:46			06:40			07:33	07:32	08:24
	21:55	32	21:05 (WEA06)	21:13			20:04			18:51	16:43	16:06
7	05:03		20:33 (WEA06)	05:48			06:42			07:35	07:34	08:25
	21:54	32	21:05 (WEA06)	21:11			20:02			18:49	16:41	16:05
8	05:04		20:33 (WEA06)	05:49			06:44			07:37	07:35	08:26
	21:54	33	21:06 (WEA06)	21:09			19:59			18:46	16:40	16:05
9	05:05		20:33 (WEA06)	05:51			06:45			07:39	07:37	08:28
	21:53	33	21:06 (WEA06)	21:07			19:57			18:44	16:38	16:05
10	05:06		20:33 (WEA06)	05:53			06:47			07:40	07:39	08:29
	21:52	33	21:06 (WEA06)	21:05			19:55			18:41	16:36	16:04
11	05:07		20:33 (WEA06)	05:55			06:49			07:42	07:41	08:30
	21:51	33	21:06 (WEA06)	21:03			19:52			18:39	16:34	16:04
12	05:08		20:33 (WEA06)	05:56			06:51			07:44	07:43	08:31
	21:50	34	21:07 (WEA06)	21:01			19:50			18:37	16:33	16:04
13	05:10		20:33 (WEA06)	05:58			06:52			07:46	07:45	08:32
	21:49	34	21:07 (WEA06)	20:59			19:47			18:34	16:31	16:04
14	05:11		20:33 (WEA06)	06:00			06:54			07:48	07:47	08:33
	21:48	34	21:07 (WEA06)	20:57			19:45			18:32	16:30	16:04
15	05:12		20:33 (WEA06)	06:01			06:56			07:50	07:49	08:34
	21:47	34	21:07 (WEA06)	20:55			19:42			18:30	16:28	16:04
16	05:13		20:33 (WEA06)	06:03			06:58			07:52	07:51	08:35
	21:46	34	21:07 (WEA06)	20:53			19:40			18:27	16:26	16:04
17	05:15		20:34 (WEA06)	06:05			06:59			07:53	07:52	08:36
	21:45	33	21:07 (WEA06)	20:51			19:37			18:25	16:25	16:04
18	05:16		20:34 (WEA06)	06:07			07:01			07:55	07:54	08:37
	21:44	33	21:07 (WEA06)	20:48			19:35			18:23	16:24	16:04
19	05:18		20:34 (WEA06)	06:08	19:45 (WEA05)	07:03		07:57	07:56	08:37
	21:42	33	21:07 (WEA06)	20:46	8	19:53 (WEA05)	19:32			18:21	16:22	16:04
20	05:19		20:34 (WEA06)	06:10	19:42 (WEA05)	07:05		07:59	07:58	08:38
	21:41	34	21:08 (WEA06)	20:44	14	19:56 (WEA05)	19:30			18:18	16:21	16:05
21	05:20		20:34 (WEA06)	06:12	19:39 (WEA05)	07:06		08:01	08:00	08:39
	21:40	33	21:07 (WEA06)	20:42	18	19:57 (WEA05)	19:28			18:16	16:19	16:05
22	05:22		20:34 (WEA06)	06:14	19:38 (WEA05)	07:08		08:03	08:02	08:39
	21:38	31	21:05 (WEA06)	20:40	20	19:58 (WEA05)	19:25			18:14	16:18	16:06
23	05:23		20:35 (WEA06)	06:16	19:37 (WEA05)	07:10		08:05	08:03	08:40
	21:37	29	21:04 (WEA06)	20:37	22	19:59 (WEA05)	19:23			18:12	16:17	16:06
24	05:25		20:35 (WEA06)	06:17	19:35 (WEA05)	07:12		08:07	08:05	08:40
	21:35	28	21:03 (WEA06)	20:35	24	19:59 (WEA05)	19:20			18:10	16:16	16:07
25	05:26		20:36 (WEA06)	06:19	19:35 (WEA05)	07:13		07:09	08:07	08:40
	21:34	26	21:02 (WEA06)	20:33	24	19:59 (WEA05)	19:18			17:07	16:15	16:07
26	05:28		20:36 (WEA06)	06:21	19:35 (WEA05)	07:15		07:10	08:08	08:41
	21:32	24	21:00 (WEA06)	20:30	25	20:00 (WEA05)	19:15			17:05	16:14	16:08
27	05:29		20:37 (WEA06)	06:23	19:33 (WEA05)	07:17		07:12	08:10	08:41
	21:31	21	20:58 (WEA06)	20:28	26	19:59 (WEA05)	19:13			17:03	16:13	16:09
28	05:31		20:38 (WEA06)	06:24	19:33 (WEA05)	07:19		07:14	08:12	08:41
	21:29	19	20:57 (WEA06)	20:26	24	19:57 (WEA05)	19:10			17:01	16:12	16:10
29	05:33		20:38 (WEA06)	06:26	19:33 (WEA05)	07:21		07:16	08:13	08:41
	21:28	17	20:55 (WEA06)	20:23	22	19:55 (WEA05)	19:08			16:59	16:11	16:11
30	05:34		20:40 (WEA06)	06:28	19:33 (WEA05)	07:22		07:18	08:15	08:41
	21:26	14	20:54 (WEA06)	20:21	19	19:52 (WEA05)	19:05			16:57	16:10	16:12
31	05:36		20:41 (WEA06)	06:30	19:33 (WEA05)			07:20		08:41
	21:24	11	20:52 (WEA06)	20:19	17	19:50 (WEA05)			16:55			16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		907			276			38				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,62			0,63			0,63				
Gesamte Reduktion		0,22			0,26			0,21				
Met.wahrsch.Beschattung		203			70			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP20 - Wischhofstraße 13, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51			05:02		20:25 (WEA06)
	16:14	17:05	18:00	19:58			20:53			21:43	30	20:55 (WEA06)
2	08:41	08:10	07:12	06:57			05:49			05:01		20:26 (WEA06)
	16:15	17:07	18:02	20:00			20:55			21:44	30	20:56 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:26 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	30	20:56 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:26 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	29	20:55 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:27 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	29	20:56 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:27 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	28	20:55 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:27 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	28	20:55 (WEA06)
8	08:39	07:59	06:58	06:43		19:41 (WEA05)	05:37			04:57		20:28 (WEA06)
	16:23	17:19	18:13	20:11	2	19:43 (WEA05)	21:05			21:50	27	20:55 (WEA06)
9	08:38	07:57	06:56	06:40		19:39 (WEA05)	05:35		20:34 (WEA06)	04:56		20:29 (WEA06)
	16:24	17:21	18:15	20:13	6	19:45 (WEA05)	21:07	3	20:37 (WEA06)	21:51	27	20:56 (WEA06)
10	08:38	07:55	06:53	06:38		19:38 (WEA05)	05:33		20:31 (WEA06)	04:55		20:29 (WEA06)
	16:26	17:23	18:17	20:15	10	19:48 (WEA05)	21:09	7	20:38 (WEA06)	21:52	26	20:55 (WEA06)
11	08:37	07:53	06:51	06:36		19:36 (WEA05)	05:32		20:30 (WEA06)	04:55		20:30 (WEA06)
	16:27	17:25	18:19	20:16	13	19:49 (WEA05)	21:11	10	20:40 (WEA06)	21:53	25	20:55 (WEA06)
12	08:36	07:51	06:48	06:33		19:35 (WEA05)	05:30		20:29 (WEA06)	04:55		20:30 (WEA06)
	16:29	17:27	18:21	20:18	16	19:51 (WEA05)	21:12	12	20:41 (WEA06)	21:53	26	20:56 (WEA06)
13	08:36	07:49	06:46	06:31		19:35 (WEA05)	05:28		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:30	17:29	18:23	20:20	18	19:53 (WEA05)	21:14	15	20:42 (WEA06)	21:54	25	20:55 (WEA06)
14	08:35	07:47	06:44	06:29		19:35 (WEA05)	05:26		20:27 (WEA06)	04:54		20:30 (WEA06)
	16:32	17:31	18:25	20:22	20	19:55 (WEA05)	21:16	17	20:44 (WEA06)	21:55	25	20:55 (WEA06)
15	08:34	07:45	06:41	06:26		19:33 (WEA05)	05:25		20:26 (WEA06)	04:54		20:31 (WEA06)
	16:33	17:33	18:27	20:24	23	19:56 (WEA05)	21:17	20	20:46 (WEA06)	21:55	24	20:55 (WEA06)
16	08:33	07:43	06:39	06:24		19:34 (WEA05)	05:23		20:25 (WEA06)	04:54		20:31 (WEA06)
	16:35	17:35	18:29	20:26	24	19:58 (WEA05)	21:19	23	20:48 (WEA06)	21:56	24	20:55 (WEA06)
17	08:32	07:41	06:36	06:22		19:34 (WEA05)	05:21		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:37	17:37	18:30	20:27	24	19:58 (WEA05)	21:21	24	20:48 (WEA06)	21:56	24	20:56 (WEA06)
18	08:31	07:39	06:34	06:19		19:34 (WEA05)	05:20		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:39	17:39	18:32	20:29	24	19:58 (WEA05)	21:22	26	20:50 (WEA06)	21:57	24	20:56 (WEA06)
19	08:30	07:37	06:31	06:17		19:34 (WEA05)	05:18		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:40	17:41	18:34	20:31	22	19:56 (WEA05)	21:24	27	20:51 (WEA06)	21:57	24	20:56 (WEA06)
20	08:29	07:34	06:29	06:15		19:35 (WEA05)	05:17		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:42	17:43	18:36	20:33	20	19:55 (WEA05)	21:26	29	20:53 (WEA06)	21:58	24	20:56 (WEA06)
21	08:27	07:32	06:27	06:13		19:36 (WEA05)	05:15		20:24 (WEA06)	04:54		20:32 (WEA06)
	16:44	17:44	18:38	20:35	18	19:54 (WEA05)	21:27	31	20:55 (WEA06)	21:58	24	20:56 (WEA06)
22	08:26	07:30	06:24	06:10		19:37 (WEA05)	05:14		20:24 (WEA06)	04:54		20:33 (WEA06)
	16:46	17:46	18:40	20:37	15	19:52 (WEA05)	21:29	32	20:56 (WEA06)	21:58	24	20:57 (WEA06)
23	08:25	07:28	06:22	06:08		19:39 (WEA05)	05:12		20:23 (WEA06)	04:54		20:33 (WEA06)
	16:48	17:48	18:42	20:38	11	19:50 (WEA05)	21:30	32	20:55 (WEA06)	21:58	24	20:57 (WEA06)
24	08:24	07:26	06:19	06:06			05:11		20:23 (WEA06)	04:54		20:33 (WEA06)
	16:49	17:50	18:43	20:40			21:32	32	20:55 (WEA06)	21:58	24	20:57 (WEA06)
25	08:22	07:23	06:17	06:04			05:10		20:24 (WEA06)	04:55		20:34 (WEA06)
	16:51	17:52	18:45	20:42			21:33	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
26	08:21	07:21	06:14	06:02			05:09		20:24 (WEA06)	04:55		20:34 (WEA06)
	16:53	17:54	18:47	20:44			21:35	32	20:56 (WEA06)	21:58	23	20:57 (WEA06)
27	08:19	07:19	06:12	05:59			05:07		20:24 (WEA06)	04:56		20:34 (WEA06)
	16:55	17:56	18:49	20:46			21:36	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
28	08:18	07:17	06:09	05:57			05:06		20:24 (WEA06)	04:56		20:34 (WEA06)
	16:57	17:58	18:51	20:48			21:37	32	20:56 (WEA06)	21:58	24	20:58 (WEA06)
29	08:16		07:07	05:55			05:05		20:24 (WEA06)	04:57		20:34 (WEA06)
	16:59		19:53	20:49			21:39	32	20:56 (WEA06)	21:58	25	20:59 (WEA06)
30	08:15		07:05	05:53			05:04		20:25 (WEA06)	04:57		20:34 (WEA06)
	17:01		19:54	20:51			21:40	31	20:56 (WEA06)	21:58	25	20:59 (WEA06)
31	08:13		07:02				05:03		20:25 (WEA06)			
	17:03		19:56				21:41	31	20:56 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					266			562			770	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,63			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					60			143			176	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP20 - Wischhofstraße 13, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		20:34 (WEA06)	05:38		20:39 (WEA06)	06:31	19:36 (WEA05)	07:24	07:22	08:17
	21:57	26	21:00 (WEA06)	21:22	12	20:51 (WEA06)	20:16	12	19:48 (WEA05)	19:03	16:53	16:09
2	04:59		20:34 (WEA06)	05:39		20:40 (WEA06)	06:33		19:36 (WEA05)	07:26	07:24	08:18
	21:57	26	21:00 (WEA06)	21:21	9	20:49 (WEA06)	20:14	9	19:45 (WEA05)	19:01	16:51	16:08
3	05:00		20:33 (WEA06)	05:41		20:43 (WEA06)	06:35		19:37 (WEA05)	07:28	07:26	08:20
	21:56	27	21:00 (WEA06)	21:19	5	20:48 (WEA06)	20:12	6	19:43 (WEA05)	18:58	16:49	16:08
4	05:00		20:34 (WEA06)	05:43			06:37		19:39 (WEA05)	07:30	07:28	08:21
	21:56	27	21:01 (WEA06)	21:17			20:09	2	19:41 (WEA05)	18:56	16:47	16:07
5	05:01		20:34 (WEA06)	05:44			06:38			07:31	07:30	08:22
	21:55	27	21:01 (WEA06)	21:15			20:07			18:53	16:45	16:06
6	05:02		20:34 (WEA06)	05:46			06:40			07:33	07:32	08:24
	21:55	28	21:02 (WEA06)	21:13			20:04			18:51	16:43	16:06
7	05:03		20:34 (WEA06)	05:48			06:42			07:35	07:34	08:25
	21:54	28	21:02 (WEA06)	21:11			20:02			18:49	16:41	16:05
8	05:04		20:34 (WEA06)	05:49			06:44			07:37	07:35	08:26
	21:54	29	21:03 (WEA06)	21:09			19:59			18:46	16:40	16:05
9	05:05		20:34 (WEA06)	05:51			06:45			07:39	07:37	08:28
	21:53	29	21:03 (WEA06)	21:07			19:57			18:44	16:38	16:05
10	05:06		20:34 (WEA06)	05:53			06:47			07:40	07:39	08:29
	21:52	29	21:03 (WEA06)	21:05			19:55			18:41	16:36	16:04
11	05:07		20:33 (WEA06)	05:55			06:49			07:42	07:41	08:30
	21:51	31	21:04 (WEA06)	21:03			19:52			18:39	16:34	16:04
12	05:08		20:33 (WEA06)	05:56			06:51			07:44	07:43	08:31
	21:50	31	21:04 (WEA06)	21:01			19:50			18:37	16:33	16:04
13	05:10		20:33 (WEA06)	05:58			06:52			07:46	07:45	08:32
	21:49	31	21:04 (WEA06)	20:59			19:47			18:34	16:31	16:04
14	05:11		20:33 (WEA06)	06:00			06:54			07:48	07:47	08:33
	21:48	31	21:04 (WEA06)	20:57			19:45			18:32	16:30	16:04
15	05:12		20:33 (WEA06)	06:01			06:56			07:50	07:49	08:34
	21:47	31	21:04 (WEA06)	20:55			19:42			18:30	16:28	16:04
16	05:13		20:33 (WEA06)	06:03			06:58			07:52	07:51	08:35
	21:46	31	21:04 (WEA06)	20:53			19:40			18:27	16:26	16:04
17	05:15		20:33 (WEA06)	06:05			06:59			07:53	07:52	08:36
	21:45	32	21:05 (WEA06)	20:51			19:37			18:25	16:25	16:04
18	05:16		20:33 (WEA06)	06:07			07:01			07:55	07:54	08:37
	21:44	32	21:05 (WEA06)	20:48			19:35			18:23	16:24	16:04
19	05:18		20:33 (WEA06)	06:08		19:49 (WEA05)	07:03			07:57	07:56	08:37
	21:42	32	21:05 (WEA06)	20:46	3	19:52 (WEA05)	19:32			18:21	16:22	16:04
20	05:19		20:34 (WEA06)	06:10		19:45 (WEA05)	07:05			07:59	07:58	08:38
	21:41	32	21:06 (WEA06)	20:44	11	19:56 (WEA05)	19:30			18:18	16:21	16:05
21	05:20		20:34 (WEA06)	06:12		19:42 (WEA05)	07:06			08:01	08:00	08:39
	21:40	31	21:05 (WEA06)	20:42	15	19:57 (WEA05)	19:28			18:16	16:19	16:05
22	05:22		20:33 (WEA06)	06:14		19:40 (WEA05)	07:08			08:03	08:02	08:39
	21:38	32	21:05 (WEA06)	20:40	19	19:59 (WEA05)	19:25			18:14	16:18	16:06
23	05:23		20:34 (WEA06)	06:16		19:39 (WEA05)	07:10			08:05	08:03	08:40
	21:37	30	21:04 (WEA06)	20:37	21	20:00 (WEA05)	19:23			18:12	16:17	16:06
24	05:25		20:34 (WEA06)	06:17		19:37 (WEA05)	07:12			08:07	08:05	08:40
	21:35	29	21:03 (WEA06)	20:35	23	20:00 (WEA05)	19:20			18:10	16:16	16:07
25	05:26		20:34 (WEA06)	06:19		19:37 (WEA05)	07:13			07:09	08:07	08:40
	21:34	27	21:01 (WEA06)	20:33	23	20:00 (WEA05)	19:18			17:07	16:15	16:07
26	05:28		20:35 (WEA06)	06:21		19:37 (WEA05)	07:15			07:10	08:08	08:41
	21:32	25	21:00 (WEA06)	20:30	24	20:01 (WEA05)	19:15			17:05	16:14	16:08
27	05:29		20:35 (WEA06)	06:23		19:35 (WEA05)	07:17			07:12	08:10	08:41
	21:31	23	20:58 (WEA06)	20:28	24	19:59 (WEA05)	19:13			17:03	16:13	16:09
28	05:31		20:36 (WEA06)	06:24		19:35 (WEA05)	07:19			07:14	08:12	08:41
	21:29	21	20:57 (WEA06)	20:26	22	19:57 (WEA05)	19:10			17:01	16:12	16:10
29	05:33		20:36 (WEA06)	06:26		19:35 (WEA05)	07:21			07:16	08:13	08:41
	21:28	19	20:55 (WEA06)	20:23	20	19:55 (WEA05)	19:08			16:59	16:11	16:11
30	05:34		20:37 (WEA06)	06:28		19:35 (WEA05)	07:22			07:18	08:15	08:41
	21:26	17	20:54 (WEA06)	20:21	17	19:52 (WEA05)	19:05			16:57	16:10	16:12
31	05:36		20:38 (WEA06)	06:30		19:35 (WEA05)				07:20		08:41
	21:24	14	20:52 (WEA06)	20:19	15	19:50 (WEA05)				16:55		16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		858			263			29				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,62			0,63			0,63				
Gesamte Reduktion		0,22			0,25			0,21				
Met.wahrsch.Beschattung		192			67			6				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP21 - Auf der Stroth 18, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:54 (WEA05)	05:02		20:42 (WEA06)
	16:14	17:05	18:00	19:58			20:53	6	20:00 (WEA05)	21:43	26	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49			05:01		20:42 (WEA06)
	16:15	17:07	18:02	20:00			20:55			21:44	28	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:42 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	29	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:42 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	29	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:42 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	31	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:42 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	31	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:42 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	31	21:13 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:42 (WEA06)
	16:23	17:19	18:13	20:11			21:05			21:50	31	21:13 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:43 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	31	21:14 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:55		20:43 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	31	21:14 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:43 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	31	21:14 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:44 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	31	21:15 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:43 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	31	21:14 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:43 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	31	21:14 (WEA06)
15	08:34	07:45	06:41	06:26		19:52 (WEA05)	05:25			04:54		20:44 (WEA06)
	16:33	17:33	18:27	20:24	4	19:56 (WEA05)	21:17			21:55	31	21:15 (WEA06)
16	08:33	07:43	06:39	06:24		19:51 (WEA05)	05:23			04:54		20:44 (WEA06)
	16:35	17:35	18:29	20:26	7	19:58 (WEA05)	21:19			21:56	31	21:15 (WEA06)
17	08:32	07:41	06:36	06:22		19:49 (WEA05)	05:21			04:54		20:44 (WEA06)
	16:37	17:37	18:30	20:27	11	20:00 (WEA05)	21:21			21:56	31	21:15 (WEA06)
18	08:31	07:39	06:34	06:19		19:49 (WEA05)	05:20			04:54		20:44 (WEA06)
	16:39	17:39	18:32	20:29	13	20:02 (WEA05)	21:22			21:57	31	21:15 (WEA06)
19	08:30	07:37	06:31	06:17		19:47 (WEA05)	05:18		20:49 (WEA06)	04:54		20:45 (WEA06)
	16:40	17:41	18:34	20:31	16	20:03 (WEA05)	21:24	2	20:51 (WEA06)	21:57	30	21:15 (WEA06)
20	08:29	07:34	06:29	06:15		19:47 (WEA05)	05:17		20:48 (WEA06)	04:54		20:45 (WEA06)
	16:42	17:43	18:36	20:33	17	20:04 (WEA05)	21:26	5	20:53 (WEA06)	21:58	31	21:16 (WEA06)
21	08:27	07:32	06:27	06:13		19:46 (WEA05)	05:15		20:47 (WEA06)	04:54		20:45 (WEA06)
	16:44	17:44	18:38	20:35	20	20:06 (WEA05)	21:27	8	20:55 (WEA06)	21:58	31	21:16 (WEA06)
22	08:26	07:30	06:24	06:10		19:46 (WEA05)	05:14		20:46 (WEA06)	04:54		20:46 (WEA06)
	16:46	17:46	18:40	20:37	22	20:08 (WEA05)	21:29	10	20:56 (WEA06)	21:58	31	21:17 (WEA06)
23	08:25	07:28	06:22	06:08		19:46 (WEA05)	05:12		20:44 (WEA06)	04:54		20:46 (WEA06)
	16:48	17:48	18:42	20:38	24	20:10 (WEA05)	21:30	13	20:57 (WEA06)	21:58	31	21:17 (WEA06)
24	08:24	07:26	06:19	06:06		19:46 (WEA05)	05:11		20:44 (WEA06)	04:54		20:46 (WEA06)
	16:49	17:50	18:43	20:40	24	20:10 (WEA05)	21:32	14	20:58 (WEA06)	21:58	30	21:16 (WEA06)
25	08:22	07:23	06:17	06:04		19:47 (WEA05)	05:10		20:43 (WEA06)	04:55		20:46 (WEA06)
	16:51	17:52	18:45	20:42	23	20:10 (WEA05)	21:33	17	21:00 (WEA06)	21:58	31	21:17 (WEA06)
26	08:21	07:21	06:14	06:02		19:46 (WEA05)	05:09		20:43 (WEA06)	04:55		20:46 (WEA06)
	16:53	17:54	18:47	20:44	22	20:08 (WEA05)	21:35	18	21:01 (WEA06)	21:58	31	21:17 (WEA06)
27	08:19	07:19	06:12	05:59		19:47 (WEA05)	05:07		20:43 (WEA06)	04:56		20:47 (WEA06)
	16:55	17:56	18:49	20:46	20	20:07 (WEA05)	21:36	20	21:03 (WEA06)	21:58	31	21:18 (WEA06)
28	08:18	07:17	06:09	05:57		19:48 (WEA05)	05:06		20:43 (WEA06)	04:56		20:47 (WEA06)
	16:57	17:58	18:51	20:48	18	20:06 (WEA05)	21:37	21	21:04 (WEA06)	21:58	31	21:18 (WEA06)
29	08:16		07:07	05:55		19:49 (WEA05)	05:05		20:42 (WEA06)	04:57		20:47 (WEA06)
	16:59		19:53	20:49	16	20:05 (WEA05)	21:39	23	21:05 (WEA06)	21:58	31	21:18 (WEA06)
30	08:15		07:05	05:53		19:50 (WEA05)	05:04		20:42 (WEA06)	04:57		20:47 (WEA06)
	17:01		19:54	20:51	13	20:03 (WEA05)	21:40	24	21:06 (WEA06)	21:58	31	21:18 (WEA06)
31	08:13		07:02				05:03		20:42 (WEA06)			
	17:03		19:56				21:41	25	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					270			206			916	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					59			52			208	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP21 - Auf der Stroth 18, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58		20:47 (WEA06)	05:38	06:31	07:24	07:22	08:17
	21:57	31	21:18 (WEA06)	21:22	20:16	19:03	16:53	16:09
2	04:59		20:48 (WEA06)	05:39	06:33	07:26	07:24	08:18
	21:57	31	21:19 (WEA06)	21:21	20:14	19:01	16:51	16:08
3	05:00		20:47 (WEA06)	05:41	06:35	07:28	07:26	08:20
	21:56	31	21:18 (WEA06)	21:19	20:12	18:58	16:49	16:08
4	05:00		20:48 (WEA06)	05:43	06:37	07:30	07:28	08:21
	21:56	31	21:19 (WEA06)	21:17	20:09	18:56	16:47	16:07
5	05:01		20:48 (WEA06)	05:44	06:38	07:31	07:30	08:22
	21:55	31	21:19 (WEA06)	21:15	20:07	18:53	16:45	16:06
6	05:02		20:48 (WEA06)	05:46	06:40	07:33	07:32	08:24
	21:55	31	21:19 (WEA06)	21:13	20:04	18:51	16:43	16:06
7	05:03		20:49 (WEA06)	05:48	06:42	07:35	07:34	08:25
	21:54	30	21:19 (WEA06)	21:11	20:02	18:49	16:41	16:05
8	05:04		20:49 (WEA06)	05:49	06:44	07:37	07:35	08:26
	21:54	30	21:19 (WEA06)	21:09	19:59	18:46	16:40	16:05
9	05:05		20:49 (WEA06)	05:51	06:45	07:39	07:37	08:28
	21:53	29	21:18 (WEA06)	21:07	19:57	18:44	16:38	16:05
10	05:06		20:50 (WEA06)	05:53	06:47	07:40	07:39	08:29
	21:52	28	21:18 (WEA06)	21:05	19:55	18:41	16:36	16:04
11	05:07		20:50 (WEA06)	05:55	06:49	07:42	07:41	08:30
	21:51	27	21:17 (WEA06)	21:03	19:52	18:39	16:34	16:04
12	05:08		20:50 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	26	21:16 (WEA06)	21:01	8	20:09 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		20:50 (WEA06)	05:58	19:58 (WEA05)	06:52	07:46	07:45	08:32
	21:49	25	21:15 (WEA06)	20:59	14	20:12 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		20:51 (WEA06)	06:00	19:57 (WEA05)	06:54	07:48	07:47	08:33
	21:48	23	21:14 (WEA06)	20:57	17	20:14 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		20:51 (WEA06)	06:01	19:55 (WEA05)	06:56	07:50	07:49	08:34
	21:47	22	21:13 (WEA06)	20:55	19	20:14 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		20:51 (WEA06)	06:03	19:54 (WEA05)	06:58	07:52	07:51	08:35
	21:46	21	21:12 (WEA06)	20:53	21	20:15 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		20:52 (WEA06)	06:05	19:54 (WEA05)	06:59	07:53	07:52	08:36
	21:45	19	21:11 (WEA06)	20:51	22	20:16 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		20:53 (WEA06)	06:07	19:52 (WEA05)	07:01	07:55	07:54	08:37
	21:44	17	21:10 (WEA06)	20:48	24	20:16 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		20:53 (WEA06)	06:08	19:52 (WEA05)	07:03	07:57	07:56	08:37
	21:42	16	21:09 (WEA06)	20:46	24	20:16 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		20:55 (WEA06)	06:10	19:52 (WEA05)	07:05	07:59	07:58	08:38
	21:41	13	21:08 (WEA06)	20:44	23	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		20:55 (WEA06)	06:12	19:51 (WEA05)	07:06	08:01	08:00	08:39
	21:40	12	21:07 (WEA06)	20:42	22	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		20:56 (WEA06)	06:14	19:51 (WEA05)	07:08	08:03	08:02	08:39
	21:38	9	21:05 (WEA06)	20:40	20	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23		20:58 (WEA06)	06:16	19:51 (WEA05)	07:10	08:05	08:03	08:40
	21:37	6	21:04 (WEA06)	20:37	18	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25		20:59 (WEA06)	06:17	19:51 (WEA05)	07:12	08:07	08:05	08:40
	21:35	4	21:03 (WEA06)	20:35	15	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19	19:51 (WEA05)	07:13	07:09	08:07	08:40
	21:34			20:33	13	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21	19:52 (WEA05)	07:15	07:10	08:08	08:41
	21:32			20:30	10	20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29			06:23	19:53 (WEA05)	07:17	07:12	08:10	08:41
	21:31			20:28	6	19:59 (WEA05)	19:13	17:03	16:13	16:09
28	05:31			06:24	19:54 (WEA05)	07:19	07:14	08:12	08:41
	21:29			20:26	3	19:57 (WEA05)	19:10	17:01	16:12	16:10
29	05:33			06:26		07:21	07:16	08:13	08:41
	21:28			20:23		19:08	16:59	16:11	16:11
30	05:34			06:28		07:22	07:18	08:15	08:41
	21:26			20:21		19:05	16:57	16:10	16:12
31	05:36			06:30			07:20		08:41
	21:24			20:19			16:55		16:13
Sonnenscheinstunden	511			459		382	329	260	234
astr.max.mögl.Beschattung		543		279					
Red.Sonnenscheinwahrsch.		0,38		0,42					
Reduktion Betriebsdauer		0,95		0,95					
Reduktion Windrichtung		0,62		0,62					
Gesamte Reduktion		0,22		0,25					
Met.wahrsch.Beschattung		121		69					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP22 - Auf der Stroth 24, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März			April			Mai			Juni		
1	08:41	08:11	07:14			07:00		19:04 (WEA09)	05:51		19:51 (WEA05)	05:02		20:56 (WEA06)
	16:14	17:05	18:00			19:58	14	19:18 (WEA09)	20:53	21	20:12 (WEA05)	21:43	12	21:08 (WEA06)
2	08:41	08:10	07:12			06:57		19:07 (WEA09)	05:49		19:51 (WEA05)	05:01		20:56 (WEA06)
	16:15	17:07	18:02			20:00	8	19:15 (WEA09)	20:55	20	20:11 (WEA05)	21:44	14	21:10 (WEA06)
3	08:41	08:08	07:10			06:55			05:47		19:52 (WEA05)	05:00		20:55 (WEA06)
	16:16	17:09	18:04			20:02			20:57	18	20:10 (WEA05)	21:45	16	21:11 (WEA06)
4	08:41	08:06	07:07			06:52			05:45		19:54 (WEA05)	04:59		20:55 (WEA06)
	16:17	17:11	18:06			20:04			20:58	14	20:08 (WEA05)	21:46	16	21:11 (WEA06)
5	08:40	08:04	07:05			06:50			05:43		19:56 (WEA05)	04:59		20:55 (WEA06)
	16:19	17:13	18:08			20:05			21:00	9	20:05 (WEA05)	21:47	18	21:13 (WEA
6	08:40	08:03	07:03			06:48			05:41			04:58		20:54 (WEA
	16:20	17:15	18:10			20:07			21:02			21:48	19	21:13 (WEA06)
7	08:39	08:01	07:00			06:45			05:39			04:57		20:54 (WEA06)
	16:21	17:17	18:12			20:09			21:04			21:49	20	21:14 (WEA06)
8	08:39	07:59	06:58			06:43			05:37			04:57		20:54 (WEA06)
	16:23	17:19	18:14			20:11			21:05			21:50	21	21:15 (WEA06)
9	08:38	07:57	06:56			06:40			05:35			04:56		20:55 (WEA06)
	16:24	17:21	18:15			20:13			21:07			21:51	21	21:16 (WEA06)
10	08:38	07:55	06:53			06:38			05:33			04:56		20:54 (WEA06)
	16:26	17:23	18:17			20:15			21:09			21:52	22	21:16 (WEA06)
11	08:37	07:53	06:51			06:36			05:32			04:55		20:54 (WEA06)
	16:27	17:25	18:19			20:16			21:11			21:53	23	21:17 (WEA06)
12	08:36	07:51	06:48			06:33			05:30			04:55		20:55 (WEA06)
	16:29	17:27	18:21			20:18			21:12			21:53	23	21:18 (WEA06)
13	08:36	07:49	06:46			06:31			05:28			04:54		20:54 (WEA06)
	16:30	17:29	18:23			20:20			21:14			21:54	24	21:18 (WEA06)
14	08:35	07:47	06:44			06:29			05:26			04:54		20:54 (WEA06)
	16:32	17:31	18:25			20:22			21:16			21:55	25	21:19 (WEA06)
15	08:34	07:45	06:41			06:26			05:25			04:54		20:54 (WEA06)
	16:33	17:33	18:27			20:24			21:17			21:55	26	21:20 (WEA06)
16	08:33	07:43	06:39			06:24			05:23			04:54		20:55 (WEA06)
	16:35	17:35	18:29			20:26			21:19			21:56	25	21:20 (WEA06)
17	08:32	07:41	06:36			06:22		19:57 (WEA05)	05:21			04:54		20:55 (WEA06)
	16:37	17:37	18:30			20:27	3	20:00 (WEA05)	21:21			21:56	26	21:21 (WEA06)
18	08:31	07:39	06:34			06:19		19:55 (WEA05)	05:20			04:54		20:55 (WEA06)
	16:39	17:39	18:32			20:29	7	20:02 (WEA05)	21:22			21:57	26	21:21 (WEA06)
19	08:30	07:37	06:31			06:17		19:53 (WEA05)	05:18			04:54		20:55 (WEA06)
	16:40	17:41	18:34			20:31	10	20:03 (WEA05)	21:24			21:57	26	21:21 (WEA06)
20	08:29	07:34	06:29		18:09 (WEA09)	06:15		19:52 (WEA05)	05:17			04:54		20:55 (WEA06)
	16:42	17:43	18:36	1	18:10 (WEA09)	20:33	12	20:04 (WEA05)	21:26			21:58	27	21:22 (WEA06)
21	08:27	07:32	06:27		18:06 (WEA09)	06:13		19:51 (WEA05)	05:15			04:54		20:55 (WEA
	16:44	17:44	18:38	5	18:11 (WEA09)	20:35	15	20:06 (WEA05)	21:27			21:58	27	21:22 (WEA
22	08:26	07:30	06:24		18:05 (WEA09)	06:10		19:50 (WEA05)	05:14			04:54		20:56 (WEA06)
	16:46	17:46	18:40	9	18:14 (WEA09)	20:37	18	20:08 (WEA05)	21:29			21:58	27	21:23 (WEA06)
23	08:25	07:28	06:22		18:03 (WEA09)	06:08		19:50 (WEA05)	05:12			04:54		20:56 (WEA06)
	16:48	17:48	18:42	12	18:15 (WEA09)	20:38	20	20:10 (WEA05)	21:30			21:58	26	21:22 (WEA06)
24	08:24	07:26	06:19		18:03 (WEA09)	06:06		19:49 (WEA05)	05:11			04:54		20:56 (WEA06)
	16:49	17:50	18:43	14	18:17 (WEA09)	20:40	23	20:12 (WEA05)	21:32			21:58	26	21:22 (WEA06)
25	08:22	07:23	06:17		18:01 (WEA09)	06:04		19:49 (WEA05)	05:10			04:55		20:57 (WEA06)
	16:51	17:52	18:45	18	18:19 (WEA09)	20:42	25	20:14 (WEA05)	21:33			21:58	26	21:23 (WEA06)
26	08:21	07:21	06:14		18:01 (WEA09)	06:02		19:49 (WEA05)	05:09			04:55		20:57 (WEA06)
	16:53	17:54	18:47	20	18:21 (WEA09)	20:44	26	20:15 (WEA05)	21:35			21:58	25	21:22 (WEA06)
27	08:19	07:19	06:12		18:01 (WEA09)	05:59		19:48 (WEA05)	05:07		21:02 (WEA06)	04:56		20:57 (WEA06)
	16:55	17:56	18:49	21	18:22 (WEA09)	20:46	26	20:14 (WEA05)	21:36	1	21:03 (WEA06)	21:58	26	21:23 (WEA06)
28	08:18	07:17	06:09		18:01 (WEA09)	05:57		19:48 (WEA05)	05:06		21:00 (WEA06)	04:56		20:57 (WEA06)
	16:57	17:58	18:51	23	18:24 (WEA09)	20:48	26	20:14 (WEA05)	21:37	4	21:04 (WEA06)	21:58	25	21:22 (WEA06)
29	08:16		07:07		19:01 (WEA09)	05:55		19:49 (WEA05)	05:05		20:59 (WEA06)	04:57		20:58 (WEA06)
	16:59		19:53	21	19:22 (WEA09)	20:49	24	20:13 (WEA05)	21:39	6	21:05 (WEA06)	21:58	25	21:23 (WEA06)
30	08:15		07:05		19:02 (WEA09)	05:53		19:49 (WEA05)	05:04		20:58 (WEA06)	04:57		20:58 (WEA06)
	17:01		19:54	19	19:21 (WEA09)	20:51	23	20:12 (WEA05)	21:40	8	21:06 (WEA06)	21:58	24	21:22 (WEA06)
31	08:13		07:02		19:03 (WEA09)				05:03		20:57 (WEA06)			
	17:03		19:56	17	19:20 (WEA09)				21:41	10	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367			420			493			509		
astr.max.mögl.Beschattung				180			280			111			687	
Red.Sonnenscheinwahrsch.				0,28			0,37			0,43			0,39	
Reduktion Betriebsdauer				0,95			0,95			0,95			0,95	
Reduktion Windrichtung				0,65			0,62			0,62			0,61	
Gesamte Reduktion				0,17			0,22			0,25			0,23	
Met.wahrsch.Beschattung				31			62			28			155	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP22 - Auf der Stroth 24, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September			Oktober	November	Dezember
1	04:58		20:58 (WEA06)	05:38			06:31			07:24	07:22	08:17
	21:57	24	21:22 (WEA06)	21:22			20:16			19:03	16:53	16:09
2	04:59		20:59 (WEA06)	05:39			06:33			07:26	07:24	08:18
	21:57	23	21:22 (WEA06)	21:21			20:14			19:01	16:51	16:08
3	05:00		20:59 (WEA06)	05:41			06:35			07:28	07:26	08:20
	21:56	22	21:21 (WEA06)	21:19			20:12			18:58	16:49	16:08
4	05:00		20:59 (WEA06)	05:43			06:37			07:30	07:28	08:21
	21:56	22	21:21 (WEA06)	21:17			20:09			18:56	16:47	16:07
5	05:01		21:00 (WEA06)	05:44			06:38			07:31	07:30	08:22
	21:55	20	21:20 (WEA06)	21:15			20:07			18:53	16:45	16:06
6	05:02		21:01 (WEA06)	05:46			06:40			07:33	07:32	08:24
	21:55	19	21:20 (WEA06)	21:13			20:04			18:51	16:43	16:06
7	05:03		21:01 (WEA06)	05:48			06:42			07:35	07:34	08:25
	21:54	18	21:19 (WEA06)	21:11			20:02			18:49	16:41	16:05
8	05:04		21:02 (WEA06)	05:49		20:05 (WEA05)	06:44			07:37	07:35	08:26
	21:54	17	21:19 (WEA06)	21:09	10	20:15 (WEA05)	19:59			18:46	16:40	16:05
9	05:05		21:03 (WEA06)	05:51		20:03 (WEA05)	06:45			07:39	07:37	08:28
	21:53	15	21:18 (WEA06)	21:07	15	20:18 (WEA05)	19:57			18:44	16:38	16:05
10	05:06		21:03 (WEA06)	05:53		20:01 (WEA05)	06:47		19:00 (WEA09)	07:40	07:39	08:29
	21:52	15	21:18 (WEA06)	21:05	17	20:18 (WEA05)	19:55	8	19:08 (WEA09)	18:41	16:36	16:04
11	05:07		21:04 (WEA06)	05:55		20:00 (WEA05)	06:49		18:56 (WEA09)	07:42	07:41	08:30
	21:51	13	21:17 (WEA06)	21:03	20	20:20 (WEA05)	19:52	14	19:10 (WEA09)	18:39	16:34	16:04
12	05:08		21:05 (WEA06)	05:56		19:58 (WEA05)	06:51		18:54 (WEA09)	07:44	07:43	08:31
	21:50	11	21:16 (WEA06)	21:01	22	20:20 (WEA05)	19:50	17	19:11 (WEA09)	18:37	16:33	16:04
13	05:10		21:06 (WEA06)	05:58		19:57 (WEA05)	06:52		18:53 (WEA09)	07:46	07:45	08:32
	21:49	9	21:15 (WEA06)	20:59	24	20:21 (WEA05)	19:47	20	19:13 (WEA09)	18:34	16:31	16:04
14	05:11		21:07 (WEA06)	06:00		19:57 (WEA05)	06:54		18:52 (WEA09)	07:48	07:47	08:33
	21:48	7	21:14 (WEA06)	20:57	25	20:22 (WEA05)	19:45	21	19:13 (WEA09)	18:32	16:30	16:04
15	05:12		21:08 (WEA06)	06:01		19:56 (WEA05)	06:56		18:51 (WEA09)	07:50	07:49	08:34
	21:47	5	21:13 (WEA06)	20:55	25	20:21 (WEA05)	19:42	22	19:13 (WEA09)	18:30	16:28	16:04
16	05:13		21:10 (WEA06)	06:03		19:56 (WEA05)	06:58		18:50 (WEA09)	07:52	07:51	08:35
	21:46	2	21:12 (WEA06)	20:53	26	20:22 (WEA05)	19:40	22	19:12 (WEA09)	18:27	16:26	16:04
17	05:15			06:05		19:56 (WEA05)	06:59		18:50 (WEA09)	07:53	07:52	08:36
	21:45			20:51	26	20:22 (WEA05)	19:37	20	19:10 (WEA09)	18:25	16:25	16:04
18	05:16			06:07		19:55 (WEA05)	07:01		18:49 (WEA09)	07:55	07:54	08:37
	21:44			20:48	24	20:19 (WEA05)	19:35	18	19:07 (WEA09)	18:23	16:24	16:04
19	05:18			06:08		19:55 (WEA05)	07:03		18:49 (WEA09)	07:57	07:56	08:37
	21:42			20:46	22	20:17 (WEA05)	19:32	15	19:04 (WEA09)	18:21	16:22	16:04
20	05:19			06:10		19:55 (WEA05)	07:05		18:49 (WEA09)	07:59	07:58	08:38
	21:41			20:44	20	20:15 (WEA05)	19:30	13	19:02 (WEA09)	18:18	16:21	16:05
21	05:20			06:12		19:55 (WEA05)	07:06		18:50 (WEA09)	08:01	08:00	08:39
	21:40			20:42	18	20:13 (WEA05)	19:28	10	19:00 (WEA09)	18:16	16:19	16:05
22	05:22			06:14		19:56 (WEA05)	07:08		18:50 (WEA09)	08:03	08:02	08:39
	21:38			20:40	15	20:11 (WEA05)	19:25	7	18:57 (WEA09)	18:14	16:18	16:06
23	05:23			06:16		19:56 (WEA05)	07:10		18:52 (WEA09)	08:05	08:03	08:40
	21:37			20:37	13	20:09 (WEA05)	19:23	2	18:54 (WEA09)	18:12	16:17	16:06
24	05:25			06:17		19:57 (WEA05)	07:12			08:07	08:05	08:40
	21:35			20:35	9	20:06 (WEA05)	19:20			18:10	16:16	16:07
25	05:26			06:19		19:58 (WEA05)	07:13			07:09	08:07	08:40
	21:34			20:33	6	20:04 (WEA05)	19:18			17:07	16:15	16:07
26	05:28			06:21		20:00 (WEA05)	07:15			07:10	08:08	08:41
	21:32			20:30	2	20:02 (WEA05)	19:15			17:05	16:14	16:08
27	05:29			06:23			07:17			07:12	08:10	08:41
	21:31			20:28			19:13			17:03	16:13	16:09
28	05:31			06:24			07:19			07:14	08:12	08:41
	21:29			20:26			19:10			17:01	16:12	16:10
29	05:33			06:26			07:21			07:16	08:13	08:41
	21:28			20:23			19:08			16:59	16:11	16:11
30	05:34			06:28			07:22			07:18	08:15	08:41
	21:26			20:21			19:05			16:57	16:10	16:12
31	05:36			06:30						07:20		08:41
	21:24			20:19						16:55		16:13
Sonnenscheinstunden	511			459			382			329	260	234
astr.max.mögl.Beschattung		242			339			209				
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,61			0,62			0,65				
Gesamte Reduktion		0,22			0,25			0,22				
Met.wahrsch.Beschattung		53			84			45				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP23 - Auf der Stroth 20, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:52 (WEA05)	05:02		20:45 (WEA06)
	16:14	17:05	18:00	19:58			20:53	14	20:06 (WEA05)	21:43	23	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:46 (WEA06)
	16:15	17:07	18:02	20:00			20:55	9	20:03 (WEA05)	21:44	24	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:46 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	25	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:45 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	26	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:46 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	27	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:45 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	28	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:45 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	29	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:46 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	29	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:46 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	30	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:46 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	30	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:46 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	31	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:47 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	31	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:46 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	31	21:17 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:46 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	32	21:18 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:47 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	31	21:18 (WEA06)
16	08:33	07:43	06:39	06:24		19:53 (WEA05)	05:23			04:54		20:47 (WEA06)
	16:35	17:35	18:29	20:26	5	19:58 (WEA05)	21:19			21:56	31	21:18 (WEA06)
17	08:32	07:41	06:36	06:22		19:52 (WEA05)	05:21			04:54		20:47 (WEA06)
	16:37	17:37	18:30	20:27	8	20:00 (WEA05)	21:21			21:56	32	21:19 (WEA06)
18	08:31	07:39	06:34	06:19		19:51 (WEA05)	05:20			04:54		20:47 (WEA06)
	16:39	17:39	18:32	20:29	11	20:02 (WEA05)	21:22			21:57	32	21:19 (WEA06)
19	08:30	07:37	06:31	06:17		19:49 (WEA05)	05:18			04:54		20:47 (WEA06)
	16:40	17:41	18:34	20:31	14	20:03 (WEA05)	21:24			21:57	32	21:19 (WEA06)
20	08:29	07:34	06:29	06:15		19:48 (WEA05)	05:17			04:54		20:47 (WEA06)
	16:42	17:43	18:36	20:33	16	20:04 (WEA05)	21:26			21:58	32	21:19 (WEA06)
21	08:27	07:32	06:27	06:13		19:48 (WEA05)	05:15			04:54		20:48 (WEA06)
	16:44	17:44	18:38	20:35	18	20:06 (WEA05)	21:27			21:58	31	21:19 (WEA06)
22	08:26	07:30	06:24	06:10		19:47 (WEA05)	05:14		20:53 (WEA06)	04:54		20:49 (WEA06)
	16:46	17:46	18:40	20:37	21	20:08 (WEA05)	21:29	3	20:56 (WEA06)	21:58	31	21:20 (WEA06)
23	08:25	07:28	06:22	06:08		19:47 (WEA05)	05:12		20:50 (WEA06)	04:54		20:48 (WEA06)
	16:48	17:48	18:42	20:38	23	20:10 (WEA05)	21:30	7	20:57 (WEA06)	21:58	32	21:20 (WEA06)
24	08:24	07:26	06:19	06:06		19:47 (WEA05)	05:11		20:49 (WEA06)	04:54		20:48 (WEA06)
	16:49	17:50	18:43	20:40	25	20:12 (WEA05)	21:32	9	20:58 (WEA06)	21:58	32	21:20 (WEA06)
25	08:22	07:23	06:17	06:04		19:47 (WEA05)	05:10		20:49 (WEA06)	04:55		20:49 (WEA06)
	16:51	17:52	18:45	20:42	25	20:12 (WEA05)	21:33	11	21:00 (WEA06)	21:58	32	21:21 (WEA06)
26	08:21	07:21	06:14	06:02		19:47 (WEA05)	05:09		20:48 (WEA06)	04:55		20:49 (WEA06)
	16:53	17:54	18:47	20:44	23	20:10 (WEA05)	21:35	13	21:01 (WEA06)	21:58	31	21:20 (WEA06)
27	08:19	07:19	06:12	05:59		19:47 (WEA05)	05:07		20:47 (WEA06)	04:56		20:50 (WEA06)
	16:55	17:56	18:49	20:46	23	20:10 (WEA05)	21:36	16	21:03 (WEA06)	21:58	31	21:21 (WEA06)
28	08:18	07:17	06:09	05:57		19:48 (WEA05)	05:06		20:47 (WEA06)	04:56		20:49 (WEA06)
	16:57	17:58	18:51	20:48	21	20:09 (WEA05)	21:37	17	21:04 (WEA06)	21:58	32	21:21 (WEA06)
29	08:16		07:07	05:55		19:48 (WEA05)	05:05		20:46 (WEA06)	04:57		20:50 (WEA06)
	16:59		19:53	20:49	20	20:08 (WEA05)	21:39	19	21:05 (WEA06)	21:58	31	21:21 (WEA06)
30	08:15		07:05	05:53		19:49 (WEA05)	05:04		20:46 (WEA06)	04:57		20:50 (WEA06)
	17:01		19:54	20:51	17	20:06 (WEA05)	21:40	20	21:06 (WEA06)	21:58	31	21:21 (WEA06)
31	08:13		07:02				05:03		20:46 (WEA06)			
	17:03		19:56				21:41	21	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					270			159			900	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,61			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					59			40			204	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP23 - Auf der Stroth 20, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September	Oktober	November	Dezember
1	04:58		20:50 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	32	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:51 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	31	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:50 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	31	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:51 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	30	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:51 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	29	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:52 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	28	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:52 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	27	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		20:53 (WEA06)	05:49		06:44	07:37	07:35	08:26
	21:54	26	21:19 (WEA06)	21:09		19:59	18:46	16:40	16:05
9	05:05		20:53 (WEA06)	05:51		06:45	07:39	07:37	08:28
	21:53	25	21:18 (WEA06)	21:07		19:57	18:44	16:38	16:05
10	05:06		20:53 (WEA06)	05:53		06:47	07:40	07:39	08:29
	21:52	25	21:18 (WEA06)	21:05		19:55	18:41	16:36	16:04
11	05:07		20:54 (WEA06)	05:55		20:02 (WEA05)	06:49	07:42	07:41	08:30
	21:51	23	21:17 (WEA06)	21:03	10	20:12 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		20:54 (WEA06)	05:56		19:59 (WEA05)	06:51	07:44	07:43	08:31
	21:50	22	21:16 (WEA06)	21:01	15	20:14 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		20:54 (WEA06)	05:58		19:58 (WEA05)	06:52	07:46	07:45	08:32
	21:49	21	21:15 (WEA06)	20:59	17	20:15 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		20:55 (WEA06)	06:00		19:57 (WEA05)	06:54	07:48	07:47	08:33
	21:48	19	21:14 (WEA06)	20:57	20	20:17 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		20:55 (WEA06)	06:01		19:55 (WEA05)	06:56	07:50	07:49	08:34
	21:47	18	21:13 (WEA06)	20:55	22	20:17 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		20:56 (WEA06)	06:03		19:54 (WEA05)	06:58	07:52	07:51	08:35
	21:46	16	21:12 (WEA06)	20:53	23	20:17 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		20:57 (WEA06)	06:05		19:54 (WEA05)	06:59	07:53	07:52	08:36
	21:45	14	21:11 (WEA06)	20:51	24	20:18 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		20:58 (WEA06)	06:07		19:53 (WEA05)	07:01	07:55	07:54	08:37
	21:44	12	21:10 (WEA06)	20:48	25	20:18 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		20:58 (WEA06)	06:08		19:53 (WEA05)	07:03	07:57	07:56	08:37
	21:42	11	21:09 (WEA06)	20:46	24	20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		21:00 (WEA06)	06:10		19:53 (WEA05)	07:05	07:59	07:58	08:38
	21:41	8	21:08 (WEA06)	20:44	22	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		21:01 (WEA06)	06:12		19:52 (WEA05)	07:06	08:01	08:00	08:39
	21:40	6	21:07 (WEA06)	20:42	21	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		21:03 (WEA06)	06:14		19:52 (WEA05)	07:08	08:03	08:02	08:39
	21:38	2	21:05 (WEA06)	20:40	19	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23			06:16		19:53 (WEA05)	07:10	08:05	08:03	08:40
	21:37			20:37	16	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17		19:53 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	13	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19		19:53 (WEA05)	07:13	07:09	08:07	08:40
	21:34			20:33	11	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21		19:55 (WEA05)	07:15	07:10	08:08	08:41
	21:32			20:30	7	20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29			06:23		19:55 (WEA05)	07:17	07:12	08:10	08:41
	21:31			20:28	4	19:59 (WEA05)	19:13	17:03	16:13	16:09
28	05:31			06:24			07:19	07:14	08:12	08:41
	21:29			20:26			19:10	17:01	16:12	16:10
29	05:33			06:26			07:21	07:16	08:13	08:41
	21:28			20:23			19:08	16:59	16:11	16:11
30	05:34			06:28			07:22	07:18	08:15	08:41
	21:26			20:21			19:05	16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459			382	329	260	234
astr.max.mögl.Beschattung		456			293					
Red.Sonnenscheinwahrsch.		0,38			0,42					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,62			0,61					
Gesamte Reduktion		0,22			0,25					
Met.wahrsch.Beschattung		101			73					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP24 - Auf der Stroth 23, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:53 (WEA05)	05:02		20:51 (WEA06)
	16:14	17:05	18:00	19:58			20:53	20	20:13 (WEA05)	21:43	17	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:51 (WEA06)
	16:15	17:07	18:02	20:00			20:55	17	20:11 (WEA05)	21:44	19	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47		19:56 (WEA05)	05:00		20:51 (WEA06)
	16:16	17:09	18:04	20:02			20:57	13	20:09 (WEA05)	21:45	20	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45		19:58 (WEA05)	04:59		20:50 (WEA06)
	16:17	17:11	18:06	20:04			20:58	9	20:07 (WEA05)	21:46	21	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:51 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	22	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:51 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	22	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:50 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	24	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:51 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	24	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:51 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	25	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:51 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	25	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:51 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	26	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:51 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	27	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:51 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	27	21:18 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:51 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	28	21:19 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:51 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	29	21:20 (WEA06)
16	08:33	07:43	06:39	06:24			05:23			04:54		20:52 (WEA06)
	16:35	17:35	18:29	20:26			21:19			21:56	28	21:20 (WEA06)
17	08:32	07:41	06:36	06:22			05:21			04:54		20:52 (WEA06)
	16:37	17:37	18:30	20:27			21:21			21:56	29	21:21 (WEA06)
18	08:31	07:39	06:34	06:19		19:58 (WEA05)	05:20			04:54		20:52 (WEA06)
	16:39	17:39	18:32	20:29	4	20:02 (WEA05)	21:22			21:57	29	21:21 (WEA06)
19	08:30	07:37	06:31	06:17		19:55 (WEA05)	05:18			04:54		20:52 (WEA06)
	16:40	17:41	18:34	20:31	8	20:03 (WEA05)	21:24			21:57	29	21:21 (WEA06)
20	08:29	07:34	06:29	06:15		19:54 (WEA05)	05:17			04:54		20:52 (WEA06)
	16:42	17:43	18:36	20:33	10	20:04 (WEA05)	21:26			21:58	30	21:22 (WEA06)
21	08:27	07:32	06:27	06:13		19:53 (WEA05)	05:15			04:54		20:52 (WEA06)
	16:44	17:44	18:38	20:35	13	20:06 (WEA05)	21:27			21:58	30	21:22 (WEA06)
22	08:26	07:30	06:24	06:10		19:53 (WEA05)	05:14			04:54		20:53 (WEA06)
	16:46	17:46	18:40	20:37	15	20:08 (WEA05)	21:29			21:58	30	21:23 (WEA06)
23	08:25	07:28	06:22	06:08		19:52 (WEA05)	05:12			04:54		20:53 (WEA06)
	16:48	17:48	18:42	20:38	18	20:10 (WEA05)	21:30			21:58	29	21:22 (WEA06)
24	08:24	07:26	06:19	06:06		19:52 (WEA05)	05:11		20:57 (WEA06)	04:54		20:53 (WEA06)
	16:49	17:50	18:43	20:40	20	20:12 (WEA05)	21:32	1	20:58 (WEA06)	21:58	29	21:22 (WEA06)
25	08:22	07:23	06:17	06:04		19:52 (WEA05)	05:10		20:56 (WEA06)	04:55		20:54 (WEA06)
	16:51	17:52	18:45	20:42	22	20:14 (WEA05)	21:33	4	21:00 (WEA06)	21:58	29	21:23 (WEA06)
26	08:21	07:21	06:14	06:02		19:51 (WEA05)	05:09		20:55 (WEA06)	04:55		20:54 (WEA06)
	16:53	17:54	18:47	20:44	23	20:14 (WEA05)	21:35	6	21:01 (WEA06)	21:58	28	21:22 (WEA06)
27	08:19	07:19	06:12	05:59		19:51 (WEA05)	05:07		20:54 (WEA06)	04:56		20:54 (WEA06)
	16:55	17:56	18:49	20:46	24	20:15 (WEA05)	21:36	8	21:02 (WEA06)	21:58	29	21:23 (WEA06)
28	08:18	07:17	06:09	05:57		19:51 (WEA05)	05:06		20:53 (WEA06)	04:56		20:54 (WEA06)
	16:57	17:58	18:51	20:48	23	20:14 (WEA05)	21:37	11	21:04 (WEA06)	21:58	28	21:22 (WEA06)
29	08:16		07:07	05:55		19:51 (WEA05)	05:05		20:52 (WEA06)	04:57		20:55 (WEA06)
	16:59		19:53	20:49	23	20:14 (WEA05)	21:39	13	21:05 (WEA06)	21:58	28	21:23 (WEA06)
30	08:15		07:05	05:53		19:52 (WEA05)	05:04		20:52 (WEA06)	04:57		20:54 (WEA06)
	17:01		19:54	20:51	21	20:13 (WEA05)	21:40	14	21:06 (WEA06)	21:58	28	21:22 (WEA06)
31	08:13		07:02				05:03		20:51 (WEA06)			
	17:03		19:56				21:41	16	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					224			132			789	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					49			33			179	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP24 - Auf der Stroth 23, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli			August			September	Oktober	November	Dezember
1	04:58		20:55 (WEA06)	05:38			06:31	07:24	07:22	08:16
	21:57	27	21:22 (WEA06)	21:22			20:16	19:03	16:53	16:09
2	04:59		20:56 (WEA06)	05:39			06:33	07:26	07:24	08:18
	21:57	26	21:22 (WEA06)	21:21			20:14	19:01	16:51	16:08
3	05:00		20:55 (WEA06)	05:41			06:35	07:28	07:26	08:20
	21:56	26	21:21 (WEA06)	21:19			20:12	18:58	16:49	16:08
4	05:00		20:56 (WEA06)	05:43			06:37	07:30	07:28	08:21
	21:56	25	21:21 (WEA06)	21:17			20:09	18:56	16:47	16:07
5	05:01		20:56 (WEA06)	05:44			06:38	07:31	07:30	08:22
	21:55	24	21:20 (WEA06)	21:15			20:07	18:53	16:45	16:06
6	05:02		20:57 (WEA06)	05:46			06:40	07:33	07:32	08:24
	21:55	23	21:20 (WEA06)	21:13			20:04	18:51	16:43	16:06
7	05:03		20:57 (WEA06)	05:48			06:42	07:35	07:34	08:25
	21:54	22	21:19 (WEA06)	21:11			20:02	18:49	16:41	16:05
8	05:04		20:58 (WEA06)	05:49		20:11 (WEA05)	06:44	07:37	07:35	08:26
	21:54	21	21:19 (WEA06)	21:09	2	20:13 (WEA05)	19:59	18:46	16:40	16:05
9	05:05		20:58 (WEA06)	05:51		20:07 (WEA05)	06:45	07:39	07:37	08:28
	21:53	20	21:18 (WEA06)	21:07	10	20:17 (WEA05)	19:57	18:44	16:38	16:05
10	05:06		20:59 (WEA06)	05:53		20:04 (WEA05)	06:47	07:40	07:39	08:29
	21:52	19	21:18 (WEA06)	21:05	14	20:18 (WEA05)	19:55	18:41	16:36	16:04
11	05:07		20:59 (WEA06)	05:55		20:03 (WEA05)	06:49	07:42	07:41	08:30
	21:51	18	21:17 (WEA06)	21:03	17	20:20 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		21:00 (WEA06)	05:56		20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	16	21:16 (WEA06)	21:01	19	20:20 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		21:00 (WEA06)	05:58		20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	15	21:15 (WEA06)	20:59	21	20:21 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		21:01 (WEA06)	06:00		20:00 (WEA05)	06:54	07:48	07:47	08:33
	21:48	13	21:14 (WEA06)	20:57	22	20:22 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		21:01 (WEA06)	06:01		19:58 (WEA05)	06:56	07:50	07:49	08:34
	21:47	12	21:13 (WEA06)	20:55	24	20:22 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		21:02 (WEA06)	06:03		19:58 (WEA05)	06:58	07:52	07:51	08:35
	21:46	10	21:12 (WEA06)	20:53	24	20:22 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		21:04 (WEA06)	06:05		19:58 (WEA05)	06:59	07:53	07:52	08:36
	21:45	7	21:11 (WEA06)	20:51	24	20:22 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		21:05 (WEA06)	06:07		19:57 (WEA05)	07:01	07:55	07:54	08:37
	21:44	5	21:10 (WEA06)	20:48	22	20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		21:06 (WEA06)	06:08		19:57 (WEA05)	07:03	07:57	07:56	08:37
	21:42	3	21:09 (WEA06)	20:46	20	20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19			06:10		19:58 (WEA05)	07:05	07:59	07:58	08:38
	21:41			20:44	17	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20			06:12		19:57 (WEA05)	07:06	08:01	08:00	08:39
	21:40			20:42	16	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22			06:14		19:58 (WEA05)	07:08	08:03	08:02	08:39
	21:38			20:40	13	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23			06:16		19:59 (WEA05)	07:10	08:05	08:03	08:40
	21:37			20:37	10	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17		19:59 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	7	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19		20:01 (WEA05)	07:13	07:08	08:07	08:40
	21:34			20:33	3	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21			07:15	07:10	08:08	08:41
	21:32			20:30			19:15	17:05	16:14	16:08
27	05:29			06:23			07:17	07:12	08:10	08:41
	21:31			20:28			19:13	17:03	16:13	16:09
28	05:31			06:24			07:19	07:14	08:12	08:41
	21:29			20:26			19:10	17:01	16:12	16:10
29	05:33			06:26			07:21	07:16	08:13	08:41
	21:28			20:23			19:08	16:59	16:11	16:11
30	05:34			06:28			07:22	07:18	08:15	08:41
	21:26			20:21			19:05	16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459			382	329	260	234
astr.max.mögl.Beschattung		332			285					
Red.Sonnenscheinwahrsch.		0,38			0,42					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,62			0,62					
Gesamte Reduktion		0,22			0,25					
Met.wahrsch.Beschattung		74			71					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP25 - Auf der Stroth 21, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:54 (WEA05)	05:02		20:45 (WEA06)
	16:14	17:05	18:00	19:58			20:53	14	20:08 (WEA05)	21:43	23	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:56 (WEA05)	05:01		20:46 (WEA06)
	16:15	17:07	18:02	20:00			20:55	9	20:05 (WEA05)	21:44	24	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47			05:00		20:46 (WEA06)
	16:16	17:09	18:04	20:02			20:57			21:45	25	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45			04:59		20:45 (WEA06)
	16:17	17:11	18:06	20:04			20:58			21:46	26	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43			04:59		20:46 (WEA06)
	16:19	17:13	18:08	20:05			21:00			21:47	27	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:46 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	27	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:45 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	29	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:46 (WEA06)
	16:23	17:19	18:13	20:11			21:05			21:50	29	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:46 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	30	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:55		20:46 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	30	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:46 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	30	21:16 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:47 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	30	21:17 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:46 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	30	21:16 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:47 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	30	21:17 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:47 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	30	21:17 (WEA06)
16	08:33	07:43	06:39	06:24		19:57 (WEA05)	05:23			04:54		20:47 (WEA06)
	16:35	17:35	18:29	20:26	1	19:58 (WEA05)	21:19			21:56	30	21:17 (WEA06)
17	08:32	07:41	06:36	06:22		19:55 (WEA05)	05:21			04:54		20:47 (WEA06)
	16:37	17:37	18:30	20:27	5	20:00 (WEA05)	21:21			21:56	31	21:18 (WEA06)
18	08:31	07:39	06:34	06:19		19:54 (WEA05)	05:20			04:54		20:48 (WEA06)
	16:39	17:39	18:32	20:29	8	20:02 (WEA05)	21:22			21:57	30	21:18 (WEA06)
19	08:30	07:37	06:31	06:17		19:52 (WEA05)	05:18			04:54		20:48 (WEA06)
	16:40	17:41	18:34	20:31	11	20:03 (WEA05)	21:24			21:57	30	21:18 (WEA06)
20	08:29	07:34	06:29	06:15		19:51 (WEA05)	05:17			04:54		20:48 (WEA06)
	16:42	17:43	18:36	20:33	13	20:04 (WEA05)	21:26			21:58	30	21:18 (WEA06)
21	08:27	07:32	06:27	06:13		19:50 (WEA05)	05:15		20:52 (WEA06)	04:54		20:48 (WEA06)
	16:44	17:44	18:38	20:35	16	20:06 (WEA05)	21:27	3	20:55 (WEA06)	21:58	30	21:18 (WEA06)
22	08:26	07:30	06:24	06:10		19:50 (WEA05)	05:14		20:51 (WEA06)	04:54		20:49 (WEA06)
	16:46	17:46	18:40	20:37	18	20:08 (WEA05)	21:29	5	20:56 (WEA06)	21:58	30	21:19 (WEA06)
23	08:25	07:28	06:22	06:08		19:50 (WEA05)	05:12		20:49 (WEA06)	04:54		20:49 (WEA06)
	16:48	17:48	18:42	20:38	20	20:10 (WEA05)	21:30	8	20:57 (WEA06)	21:58	30	21:19 (WEA06)
24	08:24	07:26	06:19	06:06		19:50 (WEA05)	05:11		20:48 (WEA06)	04:54		20:49 (WEA06)
	16:49	17:50	18:43	20:40	22	20:12 (WEA05)	21:32	10	20:58 (WEA06)	21:58	30	21:19 (WEA06)
25	08:22	07:23	06:17	06:04		19:50 (WEA05)	05:10		20:48 (WEA06)	04:55		20:50 (WEA06)
	16:51	17:52	18:45	20:42	24	20:14 (WEA05)	21:33	12	21:00 (WEA06)	21:58	30	21:20 (WEA06)
26	08:21	07:21	06:14	06:02		19:49 (WEA05)	05:09		20:47 (WEA06)	04:55		20:49 (WEA06)
	16:53	17:54	18:47	20:44	23	20:12 (WEA05)	21:35	14	21:01 (WEA06)	21:58	30	21:19 (WEA06)
27	08:19	07:19	06:12	05:59		19:49 (WEA05)	05:07		20:47 (WEA06)	04:56		20:50 (WEA06)
	16:55	17:56	18:49	20:46	23	20:12 (WEA05)	21:36	16	21:03 (WEA06)	21:58	30	21:20 (WEA06)
28	08:18	07:17	06:09	05:57		19:50 (WEA05)	05:06		20:46 (WEA06)	04:56		20:50 (WEA06)
	16:57	17:58	18:51	20:48	21	20:11 (WEA05)	21:37	18	21:04 (WEA06)	21:58	30	21:20 (WEA06)
29	08:16		07:07	05:55		19:51 (WEA05)	05:05		20:46 (WEA06)	04:57		20:50 (WEA06)
	16:59		19:53	20:49	19	20:10 (WEA05)	21:39	19	21:05 (WEA06)	21:58	31	21:21 (WEA06)
30	08:15		07:05	05:53		19:52 (WEA05)	05:04		20:46 (WEA06)	04:57		20:50 (WEA06)
	17:01		19:54	20:51	16	20:08 (WEA05)	21:40	20	21:06 (WEA06)	21:58	30	21:20 (WEA06)
31	08:13		07:02				05:03		20:45 (WEA06)			
	17:03		19:56				21:41	22	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					240			170			872	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,61			0,62			0,62	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					52			43			198	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP25 - Auf der Stroth 21, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August			September	Oktober	November	Dezember
1	04:58		20:51 (WEA06)	05:38		06:31	07:24	07:22	08:16
	21:57	30	21:21 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:51 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	30	21:21 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:51 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	30	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:51 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	30	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:51 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	29	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:52 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	28	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:52 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	27	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		20:53 (WEA06)	05:49		06:44	07:37	07:35	08:26
	21:54	26	21:19 (WEA06)	21:09		19:59	18:46	16:40	16:05
9	05:05		20:53 (WEA06)	05:51		06:45	07:39	07:37	08:28
	21:53	25	21:18 (WEA06)	21:07		19:57	18:44	16:38	16:05
10	05:06		20:53 (WEA06)	05:53		20:08 (WEA05)	06:47	07:40	07:39	08:29
	21:52	25	21:18 (WEA06)	21:05	2	20:10 (WEA05)	19:55	18:41	16:36	16:04
11	05:07		20:53 (WEA06)	05:55		20:04 (WEA05)	06:49	07:42	07:41	08:30
	21:51	24	21:17 (WEA06)	21:03	11	20:15 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		20:54 (WEA06)	05:56		20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	22	21:16 (WEA06)	21:01	15	20:16 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		20:54 (WEA06)	05:58		20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	21	21:15 (WEA06)	20:59	17	20:17 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		20:54 (WEA06)	06:00		19:59 (WEA05)	06:54	07:48	07:47	08:33
	21:48	20	21:14 (WEA06)	20:57	20	20:19 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		20:55 (WEA06)	06:01		19:57 (WEA05)	06:56	07:50	07:49	08:34
	21:47	18	21:13 (WEA06)	20:55	21	20:18 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		20:55 (WEA06)	06:03		19:57 (WEA05)	06:58	07:52	07:51	08:35
	21:46	17	21:12 (WEA06)	20:53	22	20:19 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		20:56 (WEA06)	06:05		19:57 (WEA05)	06:59	07:53	07:52	08:36
	21:45	15	21:11 (WEA06)	20:51	23	20:20 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		20:57 (WEA06)	06:07		19:55 (WEA05)	07:01	07:55	07:54	08:37
	21:44	13	21:10 (WEA06)	20:48	24	20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18		20:57 (WEA06)	06:08		19:55 (WEA05)	07:03	07:57	07:56	08:37
	21:42	12	21:09 (WEA06)	20:46	22	20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19		20:59 (WEA06)	06:10		19:55 (WEA05)	07:05	07:59	07:58	08:38
	21:41	9	21:08 (WEA06)	20:44	20	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20		21:00 (WEA06)	06:12		19:55 (WEA05)	07:06	08:01	08:00	08:39
	21:40	7	21:07 (WEA06)	20:42	18	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22		21:01 (WEA06)	06:14		19:55 (WEA05)	07:08	08:03	08:02	08:39
	21:38	4	21:05 (WEA06)	20:40	16	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23		21:03 (WEA06)	06:16		19:56 (WEA05)	07:10	08:05	08:03	08:40
	21:37	1	21:04 (WEA06)	20:37	13	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17		19:56 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	10	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19		19:57 (WEA05)	07:13	07:08	08:07	08:40
	21:34			20:33	7	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21		19:58 (WEA05)	07:15	07:10	08:08	08:41
	21:32			20:30	4	20:02 (WEA05)	19:15	17:05	16:14	16:08
27	05:29			06:23			07:17	07:12	08:10	08:41
	21:31			20:28			19:13	17:03	16:13	16:09
28	05:31			06:24			07:19	07:14	08:12	08:41
	21:29			20:26			19:10	17:01	16:12	16:10
29	05:33			06:26			07:21	07:16	08:13	08:41
	21:28			20:23			19:08	16:59	16:11	16:11
30	05:34			06:28			07:22	07:18	08:15	08:41
	21:26			20:21			19:05	16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459			382	329	260	234
astr.max.mögl.Beschattung		463			265					
Red.Sonnenscheinwahrsch.		0,38			0,42					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,62			0,61					
Gesamte Reduktion		0,22			0,25					
Met.wahrsch.Beschattung		103			66					

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP26 - Auf der Stroth 25, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April			Mai			Juni		
1	08:41	08:11	07:14	07:00			05:51		19:53 (WEA05)	05:02		20:53 (WEA06)
	16:14	17:05	18:00	19:58			20:53	21	20:14 (WEA05)	21:43	15	21:08 (WEA06)
2	08:41	08:10	07:12	06:57			05:49		19:54 (WEA05)	05:01		20:54 (WEA06)
	16:15	17:07	18:02	20:00			20:55	19	20:13 (WEA05)	21:44	16	21:10 (WEA06)
3	08:41	08:08	07:10	06:55			05:47		19:55 (WEA05)	05:00		20:53 (WEA06)
	16:16	17:09	18:04	20:02			20:57	16	20:11 (WEA05)	21:45	18	21:11 (WEA06)
4	08:41	08:06	07:07	06:52			05:45		19:57 (WEA05)	04:59		20:53 (WEA06)
	16:17	17:11	18:06	20:04			20:58	12	20:09 (WEA05)	21:46	18	21:11 (WEA06)
5	08:40	08:04	07:05	06:50			05:43		19:59 (WEA05)	04:59		20:53 (WEA06)
	16:19	17:13	18:08	20:05			21:00	7	20:06 (WEA05)	21:47	20	21:13 (WEA06)
6	08:40	08:03	07:03	06:48			05:41			04:58		20:53 (WEA06)
	16:20	17:15	18:10	20:07			21:02			21:48	20	21:13 (WEA06)
7	08:39	08:01	07:00	06:45			05:39			04:57		20:52 (WEA06)
	16:21	17:17	18:12	20:09			21:04			21:49	22	21:14 (WEA06)
8	08:39	07:59	06:58	06:43			05:37			04:57		20:53 (WEA06)
	16:23	17:19	18:14	20:11			21:05			21:50	22	21:15 (WEA06)
9	08:38	07:57	06:56	06:40			05:35			04:56		20:53 (WEA06)
	16:24	17:21	18:15	20:13			21:07			21:51	23	21:16 (WEA06)
10	08:38	07:55	06:53	06:38			05:33			04:56		20:52 (WEA06)
	16:26	17:23	18:17	20:15			21:09			21:52	24	21:16 (WEA06)
11	08:37	07:53	06:51	06:36			05:32			04:55		20:53 (WEA06)
	16:27	17:25	18:19	20:16			21:11			21:53	24	21:17 (WEA06)
12	08:36	07:51	06:48	06:33			05:30			04:55		20:53 (WEA06)
	16:29	17:27	18:21	20:18			21:12			21:53	25	21:18 (WEA06)
13	08:36	07:49	06:46	06:31			05:28			04:54		20:53 (WEA06)
	16:30	17:29	18:23	20:20			21:14			21:54	25	21:18 (WEA06)
14	08:35	07:47	06:44	06:29			05:26			04:54		20:53 (WEA06)
	16:32	17:31	18:25	20:22			21:16			21:55	26	21:19 (WEA06)
15	08:34	07:45	06:41	06:26			05:25			04:54		20:53 (WEA06)
	16:33	17:33	18:27	20:24			21:17			21:55	27	21:20 (WEA06)
16	08:33	07:43	06:39	06:24			05:23			04:54		20:53 (WEA06)
	16:35	17:35	18:29	20:26			21:19			21:56	27	21:20 (WEA06)
17	08:32	07:41	06:36	06:22			05:21			04:54		20:54 (WEA06)
	16:37	17:37	18:30	20:27			21:21			21:56	27	21:21 (WEA06)
18	08:31	07:39	06:34	06:19		19:59 (WEA05)	05:20			04:54		20:54 (WEA06)
	16:39	17:39	18:32	20:29	3	20:02 (WEA05)	21:22			21:57	27	21:21 (WEA06)
19	08:30	07:37	06:31	06:17		19:56 (WEA05)	05:18			04:54		20:54 (WEA06)
	16:40	17:41	18:34	20:31	7	20:03 (WEA05)	21:24			21:57	27	21:21 (WEA06)
20	08:29	07:34	06:29	06:15		19:55 (WEA05)	05:17			04:54		20:54 (WEA06)
	16:42	17:43	18:36	20:33	9	20:04 (WEA05)	21:26			21:58	28	21:22 (WEA06)
21	08:27	07:32	06:27	06:13		19:54 (WEA05)	05:15			04:54		20:54 (WEA06)
	16:44	17:44	18:38	20:35	12	20:06 (WEA05)	21:27			21:58	28	21:22 (WEA06)
22	08:26	07:30	06:24	06:10		19:53 (WEA05)	05:14			04:54		20:55 (WEA06)
	16:46	17:46	18:40	20:37	15	20:08 (WEA05)	21:29			21:58	28	21:23 (WEA06)
23	08:25	07:28	06:22	06:08		19:53 (WEA05)	05:12			04:54		20:55 (WEA06)
	16:48	17:48	18:42	20:38	17	20:10 (WEA05)	21:30			21:58	27	21:22 (WEA06)
24	08:24	07:26	06:19	06:06		19:52 (WEA05)	05:11			04:54		20:55 (WEA06)
	16:49	17:50	18:43	20:40	20	20:12 (WEA05)	21:32			21:58	27	21:22 (WEA06)
25	08:22	07:23	06:17	06:04		19:52 (WEA05)	05:10			04:55		20:56 (WEA06)
	16:51	17:52	18:45	20:42	22	20:14 (WEA05)	21:33			21:58	27	21:23 (WEA06)
26	08:21	07:21	06:14	06:02		19:51 (WEA05)	05:09		20:58 (WEA06)	04:55		20:55 (WEA06)
	16:53	17:54	18:47	20:44	23	20:14 (WEA05)	21:35	3	21:01 (WEA06)	21:58	27	21:22 (WEA06)
27	08:19	07:19	06:12	05:59		19:51 (WEA05)	05:07		20:57 (WEA06)	04:56		20:56 (WEA06)
	16:55	17:56	18:49	20:46	25	20:16 (WEA05)	21:36	5	21:02 (WEA06)	21:58	27	21:23 (WEA06)
28	08:18	07:17	06:09	05:57		19:51 (WEA05)	05:06		20:56 (WEA06)	04:56		20:56 (WEA06)
	16:57	17:58	18:51	20:48	24	20:15 (WEA05)	21:37	8	21:04 (WEA06)	21:58	26	21:22 (WEA06)
29	08:16		07:07	05:55		19:51 (WEA05)	05:05		20:55 (WEA06)	04:57		20:57 (WEA06)
	16:59		19:53	20:49	24	20:15 (WEA05)	21:39	10	21:05 (WEA06)	21:58	26	21:23 (WEA06)
30	08:15		07:05	05:53		19:52 (WEA05)	05:04		20:55 (WEA06)	04:57		20:56 (WEA06)
	17:01		19:54	20:51	22	20:14 (WEA05)	21:40	11	21:06 (WEA06)	21:58	26	21:22 (WEA06)
31	08:13		07:02				05:03		20:54 (WEA06)			
	17:03		19:56				21:41	13	21:07 (WEA06)			
Sonnenscheinstunden	251	274	367	420			493			509		
astr.max.mögl.Beschattung					223			125			730	
Red.Sonnenscheinwahrsch.					0,37			0,43			0,39	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,62			0,61	
Gesamte Reduktion					0,22			0,25			0,23	
Met.wahrsch.Beschattung					49			32			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP26 - Auf der Stroth 25, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober	November	Dezember
1	04:58		20:57 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	25	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		20:58 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	24	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		20:57 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	24	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		20:58 (WEA06)	05:43		06:37	07:30	07:28	08:21
	21:56	23	21:21 (WEA06)	21:17		20:09	18:56	16:47	16:07
5	05:01		20:58 (WEA06)	05:44		06:38	07:31	07:30	08:22
	21:55	22	21:20 (WEA06)	21:15		20:07	18:53	16:45	16:06
6	05:02		20:59 (WEA06)	05:46		06:40	07:33	07:32	08:24
	21:55	21	21:20 (WEA06)	21:13		20:04	18:51	16:43	16:06
7	05:03		20:59 (WEA06)	05:48		06:42	07:35	07:34	08:25
	21:54	20	21:19 (WEA06)	21:11		20:02	18:49	16:41	16:05
8	05:04		21:00 (WEA06)	05:49	20:08 (WEA05)	06:44	07:37	07:35	08:26
	21:54	19	21:19 (WEA06)	21:09	9	20:17 (WEA05)	19:59	18:46	16:40	16:05
9	05:05		21:00 (WEA06)	05:51	20:06 (WEA05)	06:45	07:39	07:37	08:28
	21:53	18	21:18 (WEA06)	21:07	14	20:20 (WEA05)	19:57	18:44	16:38	16:05
10	05:06		21:01 (WEA06)	05:53	20:03 (WEA05)	06:47	07:40	07:39	08:29
	21:52	17	21:18 (WEA06)	21:05	17	20:20 (WEA05)	19:55	18:41	16:36	16:04
11	05:07		21:02 (WEA06)	05:55	20:02 (WEA05)	06:49	07:42	07:41	08:30
	21:51	15	21:17 (WEA06)	21:03	20	20:22 (WEA05)	19:52	18:39	16:34	16:04
12	05:08		21:02 (WEA06)	05:56	20:01 (WEA05)	06:51	07:44	07:43	08:31
	21:50	14	21:16 (WEA06)	21:01	21	20:22 (WEA05)	19:50	18:37	16:33	16:04
13	05:10		21:03 (WEA06)	05:58	20:00 (WEA05)	06:52	07:46	07:45	08:32
	21:49	12	21:15 (WEA06)	20:59	23	20:23 (WEA05)	19:47	18:34	16:31	16:04
14	05:11		21:03 (WEA06)	06:00	20:00 (WEA05)	06:54	07:48	07:47	08:33
	21:48	11	21:14 (WEA06)	20:57	23	20:23 (WEA05)	19:45	18:32	16:30	16:04
15	05:12		21:04 (WEA06)	06:01	19:59 (WEA05)	06:56	07:50	07:49	08:34
	21:47	9	21:13 (WEA06)	20:55	24	20:23 (WEA05)	19:42	18:30	16:28	16:04
16	05:13		21:05 (WEA06)	06:03	19:59 (WEA05)	06:58	07:52	07:51	08:35
	21:46	7	21:12 (WEA06)	20:53	24	20:23 (WEA05)	19:40	18:27	16:26	16:04
17	05:15		21:07 (WEA06)	06:05	19:59 (WEA05)	06:59	07:53	07:52	08:36
	21:45	4	21:11 (WEA06)	20:51	23	20:22 (WEA05)	19:37	18:25	16:25	16:04
18	05:16		21:09 (WEA06)	06:07	19:58 (WEA05)	07:01	07:55	07:54	08:37
	21:44	1	21:10 (WEA06)	20:48	21	20:19 (WEA05)	19:35	18:23	16:24	16:04
19	05:18			06:08	19:58 (WEA05)	07:03	07:57	07:56	08:37
	21:42			20:46	19	20:17 (WEA05)	19:32	18:21	16:22	16:04
20	05:19			06:10	19:59 (WEA05)	07:05	07:59	07:58	08:38
	21:41			20:44	16	20:15 (WEA05)	19:30	18:18	16:21	16:05
21	05:20			06:12	19:58 (WEA05)	07:06	08:01	08:00	08:39
	21:40			20:42	15	20:13 (WEA05)	19:28	18:16	16:19	16:05
22	05:22			06:14	19:59 (WEA05)	07:08	08:03	08:02	08:39
	21:38			20:40	12	20:11 (WEA05)	19:25	18:14	16:18	16:06
23	05:23			06:16	20:00 (WEA05)	07:10	08:05	08:03	08:40
	21:37			20:37	9	20:09 (WEA05)	19:23	18:12	16:17	16:06
24	05:25			06:17	20:00 (WEA05)	07:12	08:07	08:05	08:40
	21:35			20:35	6	20:06 (WEA05)	19:20	18:10	16:16	16:07
25	05:26			06:19	20:02 (WEA05)	07:13	07:09	08:07	08:40
	21:34			20:33	2	20:04 (WEA05)	19:18	17:07	16:15	16:07
26	05:28			06:21		07:15	07:10	08:08	08:41
	21:32			20:30		19:15	17:05	16:14	16:08
27	05:29			06:23		07:17	07:12	08:10	08:41
	21:31			20:28		19:13	17:03	16:13	16:09
28	05:31			06:24		07:19	07:14	08:12	08:41
	21:29			20:26		19:10	17:01	16:12	16:10
29	05:33			06:26		07:21	07:16	08:13	08:41
	21:28			20:23		19:08	16:59	16:11	16:11
30	05:34			06:28		07:22	07:18	08:15	08:41
	21:26			20:21		19:05	16:57	16:10	16:12
31	05:36			06:30			07:20		08:41
	21:24			20:19			16:55		16:13
Sonnenscheinstunden	511			459		382	329	260	234
astr.max.mögl.Beschattung		286			298				
Red.Sonnenscheinwahrsch.		0,38			0,42				
Reduktion Betriebsdauer		0,95			0,95				
Reduktion Windrichtung		0,61			0,62				
Gesamte Reduktion		0,22			0,25				
Met.wahrsch.Beschattung		63			74				

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP27 - Strother Heuweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April		Mai		Juni		
1	08:41	08:11	07:14		07:00		19:03 (WEA09)	05:51		19:52 (WEA05)	05:02		
	16:14	17:05	18:00		19:58	19	19:22 (WEA09)	20:53	26	20:18 (WEA05)	21:43		
2	08:41	08:10	07:12		06:57		19:04 (WEA09)	05:49		19:52 (WEA05)	05:01		
	16:15	17:07	18:02		20:00	16	19:20 (WEA09)	20:55	26	20:18 (WEA05)	21:44		
3	08:41	08:08	07:10		06:55		19:06 (WEA09)	05:47		19:53 (WEA05)	05:00		
	16:16	17:09	18:04		20:02	11	19:17 (WEA09)	20:57	24	20:17 (WEA05)	21:45		
4	08:41	08:06	07:07		06:52			05:45		19:53 (WEA05)	04:59		
	16:17	17:11	18:06		20:04			20:58	23	20:16 (WEA05)	21:46		
5	08:40	08:04	07:05		06:50			05:43		19:54 (WEA05)	04:59		21:10 (WEA06)
	16:19	17:13	18:08		20:05			21:00	21	20:15 (WEA05)	21:47	3	21:13 (WEA06)
6	08:40	08:03	07:03		06:48			05:41		19:55 (WEA05)	04:58		21:09 (WEA06)
	16:20	17:15	18:10		20:07			21:02	18	20:13 (WEA05)	21:48	4	21:13 (WEA06)
7	08:39	08:01	07:00		06:45			05:39		19:56 (WEA05)	04:57		21:07 (WEA06)
	16:21	17:17	18:12		20:09			21:04	16	20:12 (WEA05)	21:49	7	21:14 (WEA06)
8	08:39	07:59	06:58		06:43			05:37		19:59 (WEA05)	04:57		21:07 (WEA06)
	16:23	17:19	18:14		20:11			21:05	11	20:10 (WEA05)	21:50	8	21:15 (WEA06)
9	08:38	07:57	06:56		06:40			05:35		20:02 (WEA05)	04:56		21:07 (WEA06)
	16:24	17:21	18:15		20:13			21:07	5	20:07 (WEA05)	21:51	9	21:16 (WEA06)
10	08:38	07:55	06:53		06:38			05:33			04:56		21:06 (WEA06)
	16:26	17:23	18:17		20:15			21:09			21:52	10	21:16 (WEA06)
11	08:37	07:53	06:51		06:36			05:32			04:55		21:06 (WEA06)
	16:27	17:25	18:19		20:16			21:11			21:53	11	21:17 (WEA06)
12	08:36	07:51	06:48		06:33			05:30			04:55		21:06 (WEA06)
	16:29	17:27	18:21		20:18			21:12			21:53	12	21:18 (WEA06)
13	08:36	07:49	06:46		06:31			05:28			04:54		21:05 (WEA06)
	16:30	17:29	18:23		20:20			21:14			21:54	13	21:18 (WEA06)
14	08:35	07:47	06:44		06:29			05:26			04:54		21:06 (WEA06)
	16:32	17:31	18:25		20:22			21:16			21:55	13	21:19 (WEA06)
15	08:34	07:45	06:41		06:26			05:25			04:54		21:06 (WEA06)
	16:33	17:33	18:27		20:24			21:18			21:55	14	21:20 (WEA06)
16	08:33	07:43	06:39		06:24			05:23			04:54		21:06 (WEA06)
	16:35	17:35	18:29		20:26			21:19			21:56	14	21:20 (WEA06)
17	08:32	07:41	06:36		06:22			05:21			04:54		21:06 (WEA06)
	16:37	17:37	18:30		20:27			21:21			21:56	15	21:21 (WEA06)
18	08:31	07:39	06:34		06:19			05:20			04:54		21:06 (WEA06)
	16:39	17:39	18:32		20:29			21:22			21:57	15	21:21 (WEA06)
19	08:30	07:37	06:31		06:17		20:00 (WEA05)	05:18			04:54		21:06 (WEA06)
	16:40	17:41	18:34		20:31	3	20:03 (WEA05)	21:24			21:57	15	21:21 (WEA06)
20	08:29	07:34	06:29		06:15		19:58 (WEA05)	05:17			04:54		21:06 (WEA06)
	16:42	17:43	18:36		20:33	6	20:04 (WEA05)	21:26			21:58	16	21:22 (WEA06)
21	08:27	07:32	06:27	18:09 (WEA09)	06:13		19:56 (WEA05)	05:15			04:54		21:06 (WEA06)
	16:44	17:44	18:38	2 18:11 (WEA09)	20:35	10	20:06 (WEA05)	21:27			21:58	16	21:22 (WEA06)
22	08:26	07:30	06:24	18:07 (WEA09)	06:10		19:55 (WEA05)	05:14			04:54		21:07 (WEA06)
	16:46	17:46	18:40	7 18:14 (WEA09)	20:37	13	20:08 (WEA05)	21:29			21:58	16	21:23 (WEA06)
23	08:25	07:28	06:22	18:05 (WEA09)	06:08		19:54 (WEA05)	05:12			04:54		21:07 (WEA06)
	16:48	17:48	18:42	10 18:15 (WEA09)	20:38	16	20:10 (WEA05)	21:30			21:58	15	21:22 (WEA06)
24	08:24	07:26	06:19	18:04 (WEA09)	06:06		19:54 (WEA05)	05:11			04:54		21:07 (WEA06)
	16:49	17:50	18:43	13 18:17 (WEA09)	20:40	18	20:12 (WEA05)	21:32			21:58	15	21:22 (WEA06)
25	08:22	07:23	06:17	18:03 (WEA09)	06:04		19:53 (WEA05)	05:10			04:55		21:08 (WEA06)
	16:51	17:52	18:45	16 18:19 (WEA09)	20:42	21	20:14 (WEA05)	21:33			21:58	15	21:23 (WEA06)
26	08:21	07:21	06:14	18:03 (WEA09)	06:02		19:53 (WEA05)	05:09			04:55		21:08 (WEA06)
	16:53	17:54	18:47	18 18:21 (WEA09)	20:44	22	20:15 (WEA05)	21:35			21:58	14	21:22 (WEA06)
27	08:19	07:19	06:12	18:02 (WEA09)	05:59		19:51 (WEA05)	05:07			04:56		21:09 (WEA06)
	16:55	17:56	18:49	20 18:22 (WEA09)	20:46	25	20:16 (WEA05)	21:36			21:58	14	21:23 (WEA06)
28	08:18	07:17	06:09	18:02 (WEA09)	05:57		19:51 (WEA05)	05:06			04:56		21:09 (WEA06)
	16:57	17:58	18:51	22 18:24 (WEA09)	20:48	27	20:18 (WEA05)	21:37			21:58	13	21:22 (WEA06)
29	08:16		07:07	19:01 (WEA09)	05:55		19:51 (WEA05)	05:05			04:57		21:10 (WEA06)
	16:59		19:53	24 19:25 (WEA09)	20:49	27	20:18 (WEA05)	21:39			21:58	13	21:23 (WEA06)
30	08:15		07:05	19:02 (WEA09)	05:53		19:51 (WEA05)	05:04			04:57		21:09 (WEA06)
	17:01		19:54	22 19:24 (WEA09)	20:51	27	20:18 (WEA05)	21:40			21:58	13	21:22 (WEA06)
31	08:13		07:02	19:03 (WEA09)				05:03					
	17:03		19:56	21 19:24 (WEA09)				21:41					
Sonnenscheinstunden	251	274	367		420			493			509		
astr.max.mögl.Beschattung				175		261			170			323	
Red.Sonnenscheinwahrsch.				0,28		0,37			0,43			0,39	
Reduktion Betriebsdauer				0,95		0,95			0,95			0,95	
Reduktion Windrichtung				0,65		0,62			0,62			0,61	
Gesamte Reduktion				0,17		0,22			0,25			0,22	
Met.wahrsch.Beschattung				30		58			43			72	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP27 - Strother Heuweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober	November	Dezember
1	04:58		21:10 (WEA06)	05:38		06:31	07:24	07:22	08:17
	21:57	12	21:22 (WEA06)	21:22		20:16	19:03	16:53	16:09
2	04:59		21:11 (WEA06)	05:39		06:33	07:26	07:24	08:18
	21:57	11	21:22 (WEA06)	21:21		20:14	19:01	16:51	16:08
3	05:00		21:11 (WEA06)	05:41		06:35	07:28	07:26	08:20
	21:56	10	21:21 (WEA06)	21:19		20:12	18:58	16:49	16:08
4	05:00		21:12 (WEA06)	05:43	20:10 (WEA05)	06:37	07:30	07:28	08:21
	21:56	9	21:21 (WEA06)	21:17	9 20:19 (WEA05)	20:09	18:56	16:47	16:07
5	05:01		21:13 (WEA06)	05:44	20:07 (WEA05)	06:38	07:31	07:30	08:22
	21:55	7	21:20 (WEA06)	21:15	14 20:21 (WEA05)	20:07	18:53	16:45	16:06
6	05:02		21:15 (WEA06)	05:46	20:06 (WEA05)	06:40	07:33	07:32	08:24
	21:55	5	21:20 (WEA06)	21:13	17 20:23 (WEA05)	20:04	18:51	16:43	16:06
7	05:03		21:16 (WEA06)	05:48	20:04 (WEA05)	06:42	07:35	07:34	08:25
	21:54	3	21:19 (WEA06)	21:11	19 20:23 (WEA05)	20:02	18:49	16:41	16:05
8	05:04		21:18 (WEA06)	05:49	20:03 (WEA05)	06:44	07:37	07:35	08:26
	21:54	1	21:19 (WEA06)	21:09	21 20:24 (WEA05)	19:59	18:46	16:40	16:05
9	05:05			05:51	20:02 (WEA05)	06:45	19:00 (WEA09)	07:39	07:37	08:28
	21:53			21:07	24 20:26 (WEA05)	19:57	11 19:11 (WEA09)	18:44	16:38	16:05
10	05:06			05:53	20:01 (WEA05)	06:47	18:58 (WEA09)	07:40	07:39	08:29
	21:52			21:05	24 20:25 (WEA05)	19:55	15 19:13 (WEA09)	18:41	16:36	16:04
11	05:07			05:55	20:01 (WEA05)	06:49	18:55 (WEA09)	07:42	07:41	08:30
	21:51			21:03	25 20:26 (WEA05)	19:52	19 19:14 (WEA09)	18:39	16:34	16:04
12	05:08			05:56	20:00 (WEA05)	06:51	18:54 (WEA09)	07:44	07:43	08:31
	21:50			21:01	26 20:26 (WEA05)	19:50	21 19:15 (WEA09)	18:37	16:33	16:04
13	05:10			05:58	19:59 (WEA05)	06:52	18:53 (WEA09)	07:46	07:45	08:32
	21:49			20:59	27 20:26 (WEA05)	19:47	22 19:15 (WEA09)	18:34	16:31	16:04
14	05:11			06:00	19:59 (WEA05)	06:54	18:53 (WEA09)	07:48	07:47	08:33
	21:48			20:57	28 20:27 (WEA05)	19:45	23 19:16 (WEA09)	18:32	16:30	16:04
15	05:12			06:01	19:59 (WEA05)	06:56	18:51 (WEA09)	07:50	07:49	08:34
	21:47			20:55	26 20:25 (WEA05)	19:42	23 19:14 (WEA09)	18:30	16:28	16:04
16	05:13			06:03	19:59 (WEA05)	06:58	18:51 (WEA09)	07:52	07:51	08:35
	21:46			20:53	24 20:23 (WEA05)	19:40	21 19:12 (WEA09)	18:27	16:26	16:04
17	05:15			06:05	19:59 (WEA05)	06:59	18:51 (WEA09)	07:53	07:52	08:36
	21:45			20:51	23 20:22 (WEA05)	19:37	19 19:10 (WEA09)	18:25	16:25	16:04
18	05:16			06:07	19:59 (WEA05)	07:01	18:50 (WEA09)	07:55	07:54	08:37
	21:44			20:48	20 20:19 (WEA05)	19:35	17 19:07 (WEA09)	18:23	16:24	16:04
19	05:18			06:08	19:59 (WEA05)	07:03	18:51 (WEA09)	07:57	07:56	08:37
	21:42			20:46	18 20:17 (WEA05)	19:32	13 19:04 (WEA09)	18:21	16:22	16:04
20	05:19			06:10	20:00 (WEA05)	07:05	18:51 (WEA09)	07:59	07:58	08:38
	21:41			20:44	15 20:15 (WEA05)	19:30	11 19:02 (WEA09)	18:18	16:21	16:05
21	05:20			06:12	20:00 (WEA05)	07:06	18:52 (WEA09)	08:01	08:00	08:39
	21:40			20:42	13 20:13 (WEA05)	19:28	8 19:00 (WEA09)	18:16	16:19	16:05
22	05:22			06:14	20:01 (WEA05)	07:08	18:53 (WEA09)	08:03	08:02	08:39
	21:38			20:40	10 20:11 (WEA05)	19:25	4 18:57 (WEA09)	18:14	16:18	16:06
23	05:23			06:16	20:03 (WEA05)	07:10		08:05	08:03	08:40
	21:37			20:37	6 20:09 (WEA05)	19:23		18:12	16:17	16:06
24	05:25			06:17	20:04 (WEA05)	07:12		08:07	08:05	08:40
	21:35			20:35	2 20:06 (WEA05)	19:20		18:10	16:16	16:07
25	05:26			06:19		07:13		07:09	08:07	08:40
	21:34			20:33		19:18		17:07	16:15	16:07
26	05:28			06:21		07:15		07:10	08:08	08:41
	21:32			20:30		19:15		17:05	16:14	16:08
27	05:29			06:23		07:17		07:12	08:10	08:41
	21:31			20:28		19:13		17:03	16:13	16:09
28	05:31			06:24		07:19		07:14	08:12	08:41
	21:29			20:26		19:10		17:01	16:12	16:10
29	05:33			06:26		07:21		07:16	08:13	08:41
	21:28			20:23		19:08		16:59	16:11	16:11
30	05:34			06:28		07:22		07:18	08:15	08:41
	21:26			20:21		19:05		16:57	16:10	16:12
31	05:36			06:30				07:20		08:41
	21:24			20:19				16:55		16:13
Sonnenscheinstunden	511			459		382		329	260	234
astr.max.mögl.Beschattung		58			391		227			
Red.Sonnenscheinwahrsch.		0,38			0,42		0,35			
Reduktion Betriebsdauer		0,95			0,95		0,95			
Reduktion Windrichtung		0,61			0,62		0,65			
Gesamte Reduktion		0,22			0,25		0,22			
Met.wahrsch.Beschattung		13			98		49			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP28 - Strother Heuweg 9, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April		Mai		Juni	
1	08:41	08:11	07:14		07:00		18:59 (WEA09)	05:51	19:50 (WEA05)	05:02
	16:14	17:05	18:00		19:58	18	19:17 (WEA09)	20:53	29 20:19 (WEA05)	21:43
2	08:41	08:10	07:12		06:57		19:01 (WEA09)	05:49	19:50 (WEA05)	05:01
	16:15	17:07	18:02		20:00	14	19:15 (WEA09)	20:55	29 20:19 (WEA05)	21:44
3	08:41	08:08	07:10		06:55		19:04 (WEA09)	05:47	19:50 (WEA05)	05:00
	16:16	17:09	18:04		20:02	7	19:11 (WEA09)	20:57	28 20:18 (WEA05)	21:45
4	08:41	08:06	07:07		06:52			05:45	19:51 (WEA05)	04:59
	16:17	17:11	18:06		20:04			20:58	26 20:17 (WEA05)	21:46
5	08:40	08:04	07:05		06:50			05:43	19:51 (WEA05)	04:59
	16:19	17:13	18:08		20:05			21:00	25 20:16 (WEA05)	21:47
6	08:40	08:03	07:03		06:48			05:41	19:52 (WEA05)	04:58
	16:20	17:15	18:10		20:07			21:02	23 20:15 (WEA05)	21:48
7	08:40	08:01	07:00		06:45			05:39	19:52 (WEA05)	04:57
	16:21	17:17	18:12		20:09			21:04	22 20:14 (WEA05)	21:49
8	08:39	07:59	06:58		06:43			05:37	19:54 (WEA05)	04:57
	16:23	17:19	18:14		20:11			21:05	20 20:14 (WEA05)	21:50
9	08:38	07:57	06:56		06:40			05:35	19:55 (WEA05)	04:56
	16:24	17:21	18:15		20:13			21:07	17 20:12 (WEA05)	21:51
10	08:38	07:55	06:53		06:38			05:33	19:57 (WEA05)	04:56
	16:26	17:23	18:17		20:15			21:09	13 20:10 (WEA05)	21:52
11	08:37	07:53	06:51		06:36			05:32	20:00 (WEA05)	04:55
	16:27	17:25	18:19		20:16			21:11	8 20:08 (WEA05)	21:53
12	08:36	07:51	06:48		06:33			05:30		04:55
	16:29	17:27	18:21		20:18			21:12		21:53
13	08:36	07:49	06:46		06:31			05:28		04:54
	16:30	17:29	18:23		20:20			21:14		21:54
14	08:35	07:47	06:44		06:29			05:26		04:54
	16:32	17:31	18:25		20:22			21:16		21:55
15	08:34	07:45	06:41		06:26			05:25		04:54
	16:33	17:33	18:27		20:24			21:18		21:55
16	08:33	07:43	06:39		06:24			05:23		04:54
	16:35	17:35	18:29		20:26			21:19		21:56
17	08:32	07:41	06:36		06:22			05:21		04:54
	16:37	17:37	18:30		20:27			21:21		21:56
18	08:31	07:39	06:34		06:19			05:20		04:54
	16:39	17:39	18:32		20:29			21:22		21:57
19	08:30	07:37	06:31		18:06 (WEA09)	06:17	20:01 (WEA05)	05:18		04:54
	16:40	17:41	18:34	2	18:08 (WEA09)	20:31	2 20:03 (WEA05)	21:24		21:57
20	08:29	07:34	06:29		18:04 (WEA09)	06:15	19:58 (WEA05)	05:17		04:54 21:21 (WEA06)
	16:42	17:43	18:36	6	18:10 (WEA09)	20:33	6 20:04 (WEA05)	21:26		21:58 1 21:22 (WEA06)
21	08:27	07:32	06:27		18:02 (WEA09)	06:13	19:56 (WEA05)	05:15		04:54 21:21 (WEA0
	16:44	17:45	18:38	9	18:11 (WEA09)	20:35	10 20:06 (WEA05)	21:27		21:58 1 21:22 (WEA
22	08:26	07:30	06:24		18:01 (WEA09)	06:10	19:55 (WEA05)	05:14		04:54 21:22 (WEA0
	16:46	17:46	18:40	13	18:14 (WEA09)	20:37	13 20:08 (WEA05)	21:29		21:58 1 21:23 (WEA06)
23	08:25	07:28	06:22		17:59 (WEA09)	06:08	19:54 (WEA05)	05:12		04:54
	16:48	17:48	18:42	16	18:15 (WEA09)	20:38	16 20:10 (WEA05)	21:30		21:58
24	08:24	07:26	06:19		17:59 (WEA09)	06:06	19:53 (WEA05)	05:11		04:54
	16:49	17:50	18:43	18	18:17 (WEA09)	20:40	19 20:12 (WEA05)	21:32		21:58
25	08:22	07:23	06:17		17:57 (WEA09)	06:04	19:52 (WEA05)	05:10		04:55
	16:51	17:52	18:45	22	18:19 (WEA09)	20:42	22 20:14 (WEA05)	21:33		21:58
26	08:21	07:21	06:14		17:57 (WEA09)	06:02	19:51 (WEA05)	05:09		04:55
	16:53	17:54	18:47	24	18:21 (WEA09)	20:44	24 20:15 (WEA05)	21:35		21:58
27	08:19	07:19	06:12		17:57 (WEA09)	05:59	19:50 (WEA05)	05:07		04:56
	16:55	17:56	18:49	25	18:22 (WEA09)	20:46	26 20:16 (WEA05)	21:36		21:58
28	08:18	07:17	06:09		17:57 (WEA09)	05:57	19:50 (WEA05)	05:06		04:56
	16:57	17:58	18:51	25	18:22 (WEA09)	20:48	28 20:18 (WEA05)	21:37		21:58
29	08:16		07:07		18:57 (WEA09)	05:55	19:49 (WEA05)	05:05		04:57
	16:59		19:53	24	19:21 (WEA09)	20:49	30 20:19 (WEA05)	21:39		21:58
30	08:15		07:05		18:58 (WEA09)	05:53	19:49 (WEA05)	05:04		04:57
	17:01		19:54	22	19:20 (WEA09)	20:51	29 20:18 (WEA05)	21:40		21:58
31	08:13		07:02		18:59 (WEA09)			05:03		
	17:03		19:56	20	19:19 (WEA09)			21:41		
Sonnenscheinstunden	251	274	367			420		493		509
astr.max.mögl.Beschattung				226			264		240	3
Red.Sonnenscheinwahrsch.				0,28			0,37		0,43	0,39
Reduktion Betriebsdauer				0,95			0,95		0,95	0,95
Reduktion Windrichtung				0,65			0,62		0,62	0,60
Gesamte Reduktion				0,17			0,22		0,25	0,22
Met.wahrsch.Beschattung				39			59		61	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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP28 - Strother Heuweg 9, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August			September			Oktober	November	Dezember
1	04:58	05:38			06:31			07:24	07:22	08:17
	21:57	21:22			20:16			19:03	16:53	16:09
2	04:59	05:39		20:08 (WEA05)	06:33			07:26	07:24	08:18
	21:57	21:21	10	20:18 (WEA05)	20:14			19:01	16:51	16:08
3	05:00	05:41		20:06 (WEA05)	06:35			07:28	07:26	08:20
	21:56	21:19	15	20:21 (WEA05)	20:12			18:58	16:49	16:08
4	05:00	05:43		20:05 (WEA05)	06:37			07:30	07:28	08:21
	21:56	21:17	18	20:23 (WEA05)	20:09			18:56	16:47	16:07
5	05:01	05:44		20:03 (WEA05)	06:38			07:31	07:30	08:22
	21:55	21:15	21	20:24 (WEA05)	20:07			18:53	16:45	16:06
6	05:02	05:46		20:02 (WEA05)	06:40			07:33	07:32	08:24
	21:55	21:13	23	20:25 (WEA05)	20:04			18:51	16:43	16:06
7	05:03	05:48		20:01 (WEA05)	06:42			07:35	07:34	08:25
	21:54	21:11	24	20:25 (WEA05)	20:02			18:49	16:41	16:05
8	05:04	05:49		20:00 (WEA05)	06:44			07:37	07:35	08:26
	21:54	21:09	26	20:26 (WEA05)	19:59			18:46	16:40	16:05
9	05:05	05:51		20:00 (WEA05)	06:45		18:58 (WEA09)	07:39	07:37	08:28
	21:53	21:07	27	20:27 (WEA05)	19:57	7	19:05 (WEA09)	18:44	16:38	16:05
10	05:06	05:53		19:59 (WEA05)	06:47		18:55 (WEA09)	07:40	07:39	08:29
	21:52	21:05	28	20:27 (WEA05)	19:55	13	19:08 (WEA09)	18:41	16:36	16:04
11	05:07	05:55		19:59 (WEA05)	06:49		18:52 (WEA09)	07:42	07:41	08:30
	21:51	21:03	28	20:27 (WEA05)	19:52	17	19:09 (WEA09)	18:39	16:34	16:04
12	05:08	05:56		19:58 (WEA05)	06:51		18:50 (WEA09)	07:44	07:43	08:31
	21:50	21:01	29	20:27 (WEA05)	19:50	20	19:10 (WEA09)	18:37	16:33	16:04
13	05:10	05:58		19:58 (WEA05)	06:52		18:49 (WEA09)	07:46	07:45	08:32
	21:49	20:59	29	20:27 (WEA05)	19:47	22	19:11 (WEA09)	18:34	16:31	16:04
14	05:11	06:00		19:58 (WEA05)	06:54		18:48 (WEA09)	07:48	07:47	08:33
	21:48	20:57	29	20:27 (WEA05)	19:45	24	19:12 (WEA09)	18:32	16:30	16:04
15	05:12	06:02		19:57 (WEA05)	06:56		18:47 (WEA09)	07:50	07:49	08:34
	21:47	20:55	28	20:25 (WEA05)	19:42	24	19:11 (WEA09)	18:30	16:28	16:04
16	05:13	06:03		19:58 (WEA05)	06:58		18:46 (WEA09)	07:52	07:51	08:35
	21:46	20:53	25	20:23 (WEA05)	19:40	26	19:12 (WEA09)	18:27	16:26	16:04
17	05:15	06:05		19:58 (WEA05)	06:59		18:46 (WEA09)	07:53	07:52	08:36
	21:45	20:51	24	20:22 (WEA05)	19:37	24	19:10 (WEA09)	18:25	16:25	16:04
18	05:16	06:07		19:58 (WEA05)	07:01		18:45 (WEA09)	07:55	07:54	08:37
	21:44	20:48	21	20:19 (WEA05)	19:35	22	19:07 (WEA09)	18:23	16:24	16:04
19	05:18	06:09		19:58 (WEA05)	07:03		18:45 (WEA09)	07:57	07:56	08:37
	21:42	20:46	19	20:17 (WEA05)	19:33	19	19:04 (WEA09)	18:21	16:22	16:04
20	05:19	06:10		19:59 (WEA05)	07:05		18:45 (WEA09)	07:59	07:58	08:38
	21:41	20:44	16	20:15 (WEA05)	19:30	17	19:02 (WEA09)	18:18	16:21	16:05
21	05:20	06:12		19:59 (WEA05)	07:06		18:46 (WEA09)	08:01	08:00	08:39
	21:40	20:42	14	20:13 (WEA05)	19:28	14	19:00 (WEA09)	18:16	16:19	16:05
22	05:22	06:14		20:01 (WEA05)	07:08		18:46 (WEA09)	08:03	08:02	08:39
	21:38	20:40	10	20:11 (WEA05)	19:25	11	18:57 (WEA09)	18:14	16:18	16:06
23	05:23	06:16		20:03 (WEA05)	07:10		18:47 (WEA09)	08:05	08:03	08:40
	21:37	20:37	6	20:09 (WEA05)	19:23	7	18:54 (WEA09)	18:12	16:17	16:06
24	05:25	06:17		20:05 (WEA05)	07:12		18:49 (WEA09)	08:07	08:05	08:40
	21:35	20:35	1	20:06 (WEA05)	19:20	3	18:52 (WEA09)	18:10	16:16	16:07
25	05:26	06:19			07:13			07:09	08:07	08:40
	21:34	20:33			19:18			17:07	16:15	16:07
26	05:28	06:21			07:15			07:10	08:08	08:41
	21:32	20:30			19:15			17:05	16:14	16:08
27	05:29	06:23			07:17			07:12	08:10	08:41
	21:31	20:28			19:13			17:03	16:13	16:09
28	05:31	06:24			07:19			07:14	08:12	08:41
	21:29	20:26			19:10			17:01	16:12	16:10
29	05:33	06:26			07:21			07:16	08:13	08:41
	21:28	20:23			19:08			16:59	16:11	16:11
30	05:34	06:28			07:22			07:18	08:15	08:41
	21:26	20:21			19:05			16:57	16:10	16:12
31	05:36	06:30						07:20		08:41
	21:24	20:19						16:55		16:13
Sonnenscheinstunden	511	459			382			329	260	234
astr.max.mögl.Beschattung			471			270				
Red.Sonnenscheinwahrsch.			0,42			0,35				
Reduktion Betriebsdauer			0,95			0,95				
Reduktion Windrichtung			0,62			0,65				
Gesamte Reduktion			0,25			0,22				
Met.wahrsch.Beschattung			118			59				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP29 - Birkenweg 11, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	21:55	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	21:53	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	05:05	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	05:06	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	21:51	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	05:12	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	21:45	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	21:44	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	05:18	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	21:41	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	21:35	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	05:26	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	21:26	20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP30 - Pappelweg 7, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni		Juli		August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51	05:02		04:58		21:12 (WEA06)	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53	21:43		21:57	10	21:22 (WEA06)	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49	05:01		04:59		21:13 (WEA06)	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44		21:57	9	21:22 (WEA06)	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00		05:00		21:12 (WEA06)	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57	21:45		21:56	9	21:21 (WEA06)	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45	04:59	21:09 (WEA06)	05:00		21:13 (WEA06)	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58	21:46	2 21:11 (WEA06)	21:56	8	21:21 (WEA06)	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43	04:59	21:09 (WEA06)	05:01		21:14 (WEA06)	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00	21:47	4 21:13 (WEA06)	21:55	6	21:20 (WEA06)	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41	04:58	21:08 (WEA06)	05:02		21:15 (WEA06)	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	5 21:13 (WEA06)	21:55	5	21:20 (WEA06)	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39	04:57	21:08 (WEA06)	05:03		21:15 (WEA06)	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	6 21:14 (WEA06)	21:54	4	21:19 (WEA06)	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37	04:57	21:08 (WEA06)	05:04		21:16 (WEA06)	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05	21:50	7 21:15 (WEA06)	21:53	3	21:19 (WEA06)	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35	04:56	21:08 (WEA06)	05:05		21:17 (WEA06)	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07	21:51	8 21:16 (WEA06)	21:53	1	21:18 (WEA06)	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33	04:56	21:08 (WEA06)	05:06			05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	8 21:16 (WEA06)	21:52			21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	21:08 (WEA06)	05:07			05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11	21:53	9 21:17 (WEA06)	21:51			21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30	04:55	21:08 (WEA06)	05:08			05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12	21:53	10 21:18 (WEA06)	21:50			21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:54	21:07 (WEA06)	05:10			05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	11 21:18 (WEA06)	21:49			20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26	04:54	21:08 (WEA06)	05:11			06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	11 21:19 (WEA06)	21:48			20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25	04:54	21:08 (WEA06)	05:12			06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17	21:55	12 21:20 (WEA06)	21:47			20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	21:08 (WEA06)	05:13			06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	12 21:20 (WEA06)	21:46			20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21	04:54	21:08 (WEA06)	05:15			06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21	21:56	13 21:21 (WEA06)	21:45			20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20	04:54	21:08 (WEA06)	05:16			06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	21:57	13 21:21 (WEA06)	21:44			20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18	04:54	21:08 (WEA06)	05:18			06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	13 21:21 (WEA06)	21:42			20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17	04:54	21:08 (WEA06)	05:19			06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:57	13 21:21 (WEA06)	21:41			20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15	04:54	21:08 (WEA06)	05:20			06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	21:58	14 21:22 (WEA06)	21:40			20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14	04:54	21:09 (WEA06)	05:22			06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	21:58	14 21:23 (WEA06)	21:38			20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12	04:54	21:09 (WEA06)	05:23			06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	21:58	13 21:22 (WEA06)	21:37			20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11	04:54	21:09 (WEA06)	05:25			06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	21:58	13 21:22 (WEA06)	21:35			20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10	04:55	21:10 (WEA06)	05:26			06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	21:58	13 21:23 (WEA06)	21:34			20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09	04:55	21:10 (WEA06)	05:28			06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	12 21:22 (WEA06)	21:32			20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07	04:56	21:11 (WEA06)	05:29			06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	12 21:23 (WEA06)	21:31			20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06	04:56	21:11 (WEA06)	05:31			06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	11 21:22 (WEA06)	21:29			20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	21:11 (WEA06)	05:33			06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	12 21:23 (WEA06)	21:28			20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:57	21:11 (WEA06)	05:34			06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	21:58	11 21:22 (WEA06)	21:26			20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03			05:36			06:30		07:20		08:41
	17:03		19:56		21:41			21:24			20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509		511			459	382	329	260	234
astr.max.mögl.Beschattung						282			55						
Red.Sonnenscheinwahrsch.						0,39			0,38						
Reduktion Betriebsdauer						0,95			0,95						
Reduktion Windrichtung						0,61			0,61						
Gesamte Reduktion						0,22			0,22						
Met.wahrsch.Beschattung						63			12						

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP31 - Jochensweg 8, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai			Juni			Juli			August	September	Oktober	November	Dezember
1	08:41	08:11	07:14	07:00	05:51			05:02		20:43 (WEA06)	04:58		20:50 (WEA06)	05:38	06:31	07:24	07:22	08:16
	16:14	17:05	18:00	19:58	20:53			21:43	25	21:08 (WEA06)	21:57	24	21:14 (WEA06)	21:22	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12	06:57	05:49			05:01		20:44 (WEA06)	04:59		20:50 (WEA06)	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55			21:44	26	21:10 (WEA06)	21:57	25	21:15 (WEA06)	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47			05:00		20:43 (WEA06)	05:00		20:50 (WEA06)	05:41	06:35	07:28	07:26	08:19
	16:16	17:09	18:04	20:02	20:57			21:45	26	21:09 (WEA06)	21:56	24	21:14 (WEA06)	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:07	06:52	05:45			04:59		20:43 (WEA06)	05:00		20:50 (WEA06)	05:43	06:37	07:30	07:28	08:21
	16:17	17:11	18:06	20:04	20:58			21:46	26	21:09 (WEA06)	21:56	25	21:15 (WEA06)	21:17	20:09	18:56	16:47	16:07
5	08:40	08:04	07:05	06:50	05:43			04:59		20:44 (WEA06)	05:01		20:50 (WEA06)	05:44	06:38	07:31	07:30	08:22
	16:19	17:13	18:08	20:05	21:00			21:47	26	21:10 (WEA06)	21:55	25	21:15 (WEA06)	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03	06:48	05:41			04:58		20:44 (WEA06)	05:02		20:50 (WEA06)	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02			21:48	25	21:09 (WEA06)	21:55	26	21:16 (WEA06)	21:13	20:04	18:51	16:43	16:06
7	08:39	08:01	07:00	06:45	05:39			04:57		20:44 (WEA06)	05:03		20:51 (WEA06)	05:48	06:42	07:35	07:33	08:25
	16:21	17:17	18:12	20:09	21:04			21:49	25	21:09 (WEA06)	21:54	25	21:16 (WEA06)	21:11	20:02	18:49	16:41	16:05
8	08:39	07:59	06:58	06:43	05:37			04:57		20:45 (WEA06)	05:04		20:51 (WEA06)	05:49	06:44	07:37	07:35	08:26
	16:23	17:19	18:13	20:11	21:05			21:50	25	21:10 (WEA06)	21:53	25	21:16 (WEA06)	21:09	19:59	18:46	16:40	16:05
9	08:38	07:57	06:56	06:40	05:35			04:56		20:45 (WEA06)	05:05		20:51 (WEA06)	05:51	06:45	07:39	07:37	08:28
	16:24	17:21	18:15	20:13	21:07			21:51	25	21:10 (WEA06)	21:53	26	21:17 (WEA06)	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:33			04:55		20:45 (WEA06)	05:06		20:51 (WEA06)	05:53	06:47	07:40	07:39	08:29
	16:26	17:23	18:17	20:15	21:09			21:52	25	21:10 (WEA06)	21:52	26	21:17 (WEA06)	21:05	19:55	18:41	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32			04:55		20:46 (WEA06)	05:07		20:51 (WEA06)	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:16	21:11			21:53	24	21:10 (WEA06)	21:51	26	21:17 (WEA06)	21:03	19:52	18:39	16:34	16:04
12	08:36	07:51	06:48	06:33	05:30			04:55		20:46 (WEA06)	05:08		20:51 (WEA06)	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:12			21:53	24	21:10 (WEA06)	21:50	25	21:16 (WEA06)	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28			04:54		20:46 (WEA06)	05:10		20:51 (WEA06)	05:58	06:52	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14			21:54	24	21:10 (WEA06)	21:49	24	21:15 (WEA06)	20:59	19:47	18:34	16:31	16:04
14	08:35	07:47	06:44	06:29	05:26			04:54		20:46 (WEA06)	05:11		20:51 (WEA06)	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16			21:55	24	21:10 (WEA06)	21:48	23	21:14 (WEA06)	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:26	05:25			04:54		20:47 (WEA06)	05:12		20:51 (WEA06)	06:01	06:56	07:50	07:49	08:34
	16:33	17:33	18:27	20:24	21:17			21:55	23	21:10 (WEA06)	21:47	22	21:13 (WEA06)	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23			04:54		20:47 (WEA06)	05:13		20:51 (WEA06)	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19			21:56	23	21:10 (WEA06)	21:46	21	21:12 (WEA06)	20:53	19:40	18:27	16:26	16:04
17	08:32	07:41	06:36	06:22	05:21			04:54		20:48 (WEA06)	05:15		20:52 (WEA06)	06:05	06:59	07:53	07:52	08:36
	16:37	17:37	18:30	20:27	21:21			21:56	23	21:11 (WEA06)	21:45	19	21:11 (WEA06)	20:51	19:37	18:25	16:25	16:04
18	08:31	07:39	06:34	06:19	05:20		20:47 (WEA06)	04:54		20:48 (WEA06)	05:16		20:52 (WEA06)	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:22	3	20:50 (WEA06)	21:57	23	21:11 (WEA06)	21:44	18	21:10 (WEA06)	20:48	19:35	18:23	16:24	16:04
19	08:30	07:37	06:31	06:17	05:18		20:45 (WEA06)	04:54		20:48 (WEA06)	05:18		20:52 (WEA06)	06:08	07:03	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	6	20:51 (WEA06)	21:57	23	21:11 (WEA06)	21:42	17	21:09 (WEA06)	20:46	19:32	18:21	16:22	16:04
20	08:29	07:34	06:29	06:15	05:17		20:45 (WEA06)	04:54		20:48 (WEA06)	05:19		20:53 (WEA06)	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	8	20:53 (WEA06)	21:57	23	21:11 (WEA06)	21:41	15	21:08 (WEA06)	20:44	19:30	18:18	16:21	16:05
21	08:27	07:32	06:27	06:13	05:15		20:44 (WEA06)	04:54		20:48 (WEA06)	05:20		20:54 (WEA06)	06:12	07:06	08:01	08:00	08:39
	16:44	17:44	18:38	20:35	21:27	11	20:55 (WEA06)	21:58	23	21:11 (WEA06)	21:40	13	21:07 (WEA06)	20:42	19:28	18:16	16:19	16:05
22	08:26	07:30	06:24	06:10	05:14		20:44 (WEA06)	04:54		20:49 (WEA06)	05:22		20:54 (WEA06)	06:14	07:08	08:03	08:01	08:39
	16:46	17:46	18:40	20:37	21:29	12	20:56 (WEA06)	21:58	23	21:12 (WEA06)	21:38	11	21:05 (WEA06)	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:12		20:43 (WEA06)	04:54		20:49 (WEA06)	05:23		20:55 (WEA06)	06:16	07:10	08:05	08:03	08:40
	16:48	17:48	18:42	20:38	21:30	14	20:57 (WEA06)	21:58	23	21:12 (WEA06)	21:37	9	21:04 (WEA06)	20:37	19:23	18:12	16:17	16:06
24	08:23	07:26	06:19	06:06	05:11		20:43 (WEA06)	04:54		20:49 (WEA06)	05:25		20:56 (WEA06)	06:17	07:12	08:07	08:05	08:40
	16:49	17:50	18:43	20:40	21:32	15	20:58 (WEA06)	21:58	23	21:12 (WEA06)	21:35	7	21:03 (WEA06)	20:35	19:20	18:10	16:16	16:07
25	08:22	07:23	06:17	06:04	05:10		20:43 (WEA06)	04:55		20:50 (WEA06)	05:26		20:56 (WEA06)	06:19	07:13	07:08	08:07	08:40
	16:51	17:52	18:45	20:42	21:33	17	21:00 (WEA06)	21:58	23	21:13 (WEA06)	21:34	5	21:01 (WEA06)	20:33	19:18	17:07	16:15	16:07
26	08:21	07:21	06:14	06:02	05:09		20:43 (WEA06)	04:55		20:49 (WEA06)	05:28		20:58 (WEA06)	06:21	07:15	07:10	08:08	08:41
	16:53	17:54	18:47	20:44	21:35	18	21:01 (WEA06)	21:58	23	21:12 (WEA06)	21:32	2	21:00 (WEA06)	20:30	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	05:59	05:07		20:43 (WEA06)	04:56		20:50 (WEA06)	05:29			06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	19	21:02 (WEA06)	21:58	23	21:13 (WEA06)	21:31			20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:09	05:57	05:06		20:43 (WEA06)	04:56		20:50 (WEA06)	05:31			06:24	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21	21:04 (WEA06)	21:58	23	21:13 (WEA06)	21:29			20:26	19:10	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05		20:43 (WEA06)	04:57		20:50 (WEA06)	05:33			06:26	07:21	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	22	21:05 (WEA06)	21:58	24	21:14 (WEA06)	21:28			20:23	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04		20:43 (WEA06)	04:57		20:50 (WEA06)	05:34			06:28	07:22	07:18	08:15	08:41
	17:01		19:54	20:51	21:40	23	21:06 (WEA06)	21:58	23	21:13 (WEA06)	21:26			20:21	19:05	16:57	16:10	16:12
31	08:13		07:02		05:03		20:43 (WEA06)				05:36			06:30		07:20		08:41
	17:03		19:56		21:41	24	21:07 (WEA06)				21:24			20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493			509			511			459	382	329	260	234
astr.max.mögl.Beschattung						213			719			508						
Red.Sonnenscheinwahrsch.						0,43			0,39			0,38						
Reduktion Betriebsdauer						0,95			0,95			0,95						
Reduktion Windrichtung						0,62			0,62			0,62						
Gesamte Reduktion						0,25			0,23			0,22						
Met.wahrsch.Beschattung						54			164			113						

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP32 - Driftweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41		08:11		07:14		17:30 (WEA08)	07:00	19:03 (WEA02)	05:51	18:51 (WEA09)	05:02	18:55 (WEA09)
	16:14		17:05		18:00	3	17:33 (WEA08)	19:58	16 19:19 (WEA02)	20:53	71 20:02 (WEA09)	21:43	109 20:46 (WEA04)
2	08:41		08:10		07:12		17:26 (WEA08)	06:57	19:05 (WEA02)	05:49	18:51 (WEA09)	05:01	18:57 (WEA09)
	16:15		17:07		18:02	9	17:35 (WEA08)	20:00	12 19:17 (WEA02)	20:55	71 20:02 (WEA09)	21:44	107 20:47 (WEA04)
3	08:41		08:08		07:10		17:24 (WEA08)	06:55	19:08 (WEA02)	05:47	18:50 (WEA09)	05:00	18:57 (WEA09)
	16:16		17:09		18:04	13	17:37 (WEA08)	20:02	4 19:12 (WEA02)	20:57	72 20:02 (WEA09)	21:45	107 20:47 (WEA04)
4	08:41		08:06		07:07		17:22 (WEA08)	06:53		05:45	18:50 (WEA09)	04:59	18:57 (WEA09)
	16:17		17:11		18:06	17	17:39 (WEA08)	20:04		20:58	82 20:28 (WEA04)	21:46	105 20:46 (WEA04)
5	08:40		08:05		07:05		17:20 (WEA08)	06:50		05:43	18:49 (WEA09)	04:59	18:58 (WEA09)
	16:19		17:13		18:08	21	17:41 (WEA08)	20:06		21:00	89 20:30 (WEA04)	21:47	105 20:47 (WEA04)
6	08:40		08:03		07:03		17:20 (WEA08)	06:48		05:41	18:49 (WEA09)	04:58	18:58 (WEA09)
	16:20		17:15		18:10	23	17:43 (WEA08)	20:07		21:02	92 20:31 (WEA04)	21:48	104 20:47 (WEA04)
7	08:40		08:01		07:00		17:18 (WEA08)	06:45		05:39	18:48 (WEA09)	04:57	18:59 (WEA09)
	16:21		17:17		18:12	26	17:44 (WEA08)	20:09		21:04	97 20:33 (WEA04)	21:49	103 20:47 (WEA04)
8	08:39		07:59		06:58		17:18 (WEA08)	06:43		05:37	18:49 (WEA09)	04:57	18:59 (WEA09)
	16:23		17:19		18:14	29	17:47 (WEA08)	20:11		21:06	100 20:35 (WEA04)	21:50	102 20:47 (WEA04)
9	08:38		07:57		06:56		17:18 (WEA08)	06:41		05:35	18:49 (WEA09)	04:56	19:00 (WEA09)
	16:24		17:21		18:15	31	17:49 (WEA08)	20:13		21:07	103 20:36 (WEA04)	21:51	102 20:47 (WEA04)
10	08:38		07:55		06:53		17:17 (WEA08)	06:38		05:33	18:48 (WEA09)	04:56	19:00 (WEA09)
	16:26		17:23		18:17	31	17:48 (WEA08)	20:15		21:09	107 20:38 (WEA04)	21:52	101 20:47 (WEA04)
11	08:37		07:53		06:51		17:17 (WEA08)	06:36	19:45 (WEA03)	05:32	18:49 (WEA09)	04:55	19:01 (WEA09)
	16:27		17:25		18:19	32	17:49 (WEA08)	20:17	5 19:50 (WEA03)	21:11	108 20:40 (WEA04)	21:53	99 20:47 (WEA04)
12	08:36		07:51		06:48		17:16 (WEA08)	06:33	19:41 (WEA03)	05:30	18:49 (WEA09)	04:55	19:02 (WEA09)
	16:29		17:27		18:21	32	17:48 (WEA08)	20:18	10 19:51 (WEA03)	21:12	111 20:41 (WEA04)	21:53	99 20:47 (WEA04)
13	08:36		07:49		06:46		17:16 (WEA08)	06:31	19:24 (WEA09)	05:28	18:48 (WEA09)	04:54	19:01 (WEA09)
	16:30		17:29		18:23	32	17:48 (WEA08)	20:20	25 19:53 (WEA03)	21:14	113 20:42 (WEA04)	21:54	99 20:47 (WEA04)
14	08:35		07:47		06:44		17:16 (WEA08)	06:29	19:18 (WEA09)	05:26	18:49 (WEA09)	04:54	19:02 (WEA09)
	16:32		17:31		18:25	30	17:46 (WEA08)	20:22	37 19:55 (WEA03)	21:16	114 20:43 (WEA04)	21:55	97 20:47 (WEA04)
15	08:34		07:45		06:41		17:17 (WEA08)	06:26	19:13 (WEA09)	05:25	18:49 (WEA09)	04:54	19:02 (WEA09)
	16:34		17:33		18:27	29	17:46 (WEA08)	20:24	43 19:56 (WEA03)	21:18	114 20:43 (WEA04)	21:55	97 20:47 (WEA04)
16	08:33		07:43		06:39		17:17 (WEA08)	06:24	19:11 (WEA09)	05:23	18:49 (WEA09)	04:54	19:03 (WEA09)
	16:35		17:35		18:29	27	17:44 (WEA08)	20:26	47 19:58 (WEA03)	21:19	115 20:44 (WEA04)	21:56	96 20:47 (WEA04)
17	08:32		07:41		06:36		17:18 (WEA08)	06:22	19:08 (WEA09)	05:21	18:49 (WEA09)	04:54	19:03 (WEA09)
	16:37		17:37		18:30	25	17:43 (WEA08)	20:28	52 20:00 (WEA03)	21:21	115 20:44 (WEA04)	21:56	97 20:48 (WEA04)
18	08:31		07:39		06:34		17:20 (WEA08)	06:19	19:06 (WEA09)	05:20	18:50 (WEA09)	04:54	19:03 (WEA09)
	16:39		17:39		18:32	22	17:42 (WEA08)	20:29	56 20:02 (WEA03)	21:22	115 20:45 (WEA04)	21:57	97 20:48 (WEA04)
19	08:30		07:37		06:32		17:21 (WEA08)	06:17	19:03 (WEA09)	05:18	18:50 (WEA09)	04:54	19:04 (WEA09)
	16:40		17:41		18:34	18	17:39 (WEA08)	20:31	60 20:03 (WEA03)	21:24	115 20:45 (WEA04)	21:57	96 20:48 (WEA04)
20	08:29		07:35		06:29		17:24 (WEA08)	06:15	19:02 (WEA09)	05:17	18:50 (WEA09)	04:54	19:04 (WEA09)
	16:42		17:43		18:36	13	17:37 (WEA08)	20:33	61 20:03 (WEA03)	21:26	115 20:45 (WEA04)	21:58	96 20:48 (WEA04)
21	08:27		07:32		06:27		18:07 (WEA02)	06:13	19:00 (WEA09)	05:15	18:51 (WEA09)	04:54	19:04 (WEA09)
	16:44		17:45		18:38	4	18:11 (WEA02)	20:35	63 20:03 (WEA03)	21:27	114 20:45 (WEA04)	21:58	96 20:48 (WEA04)
22	08:26		07:30		06:24		18:05 (WEA02)	06:10	18:59 (WEA09)	05:14	18:51 (WEA09)	04:54	19:05 (WEA09)
	16:46		17:47		18:40	9	18:14 (WEA02)	20:37	64 20:03 (WEA03)	21:29	115 20:46 (WEA04)	21:58	96 20:49 (WEA04)
23	08:25		07:28		06:22		18:04 (WEA02)	06:08	18:58 (WEA09)	05:13	18:51 (WEA09)	04:54	19:05 (WEA09)
	16:48		17:48		18:42	11	18:15 (WEA02)	20:39	64 20:02 (WEA03)	21:30	114 20:45 (WEA04)	21:58	96 20:49 (WEA04)
24	08:24		07:26		06:19		18:03 (WEA02)	06:06	18:57 (WEA09)	05:11	18:52 (WEA09)	04:55	19:04 (WEA09)
	16:49		17:50		18:43	14	18:17 (WEA02)	20:40	65 20:02 (WEA03)	21:32	114 20:46 (WEA04)	21:58	97 20:49 (WEA04)
25	08:22		07:24		06:17		18:02 (WEA02)	06:04	18:56 (WEA09)	05:10	18:52 (WEA09)	04:55	19:05 (WEA09)
	16:51		17:52		18:45	17	18:19 (WEA02)	20:42	65 20:01 (WEA03)	21:33	114 20:46 (WEA04)	21:58	97 20:50 (WEA04)
26	08:21		07:21		06:14		18:02 (WEA02)	06:02	18:55 (WEA09)	05:09	18:53 (WEA09)	04:55	19:05 (WEA09)
	16:53		17:54		18:47	19	18:21 (WEA02)	20:44	65 20:00 (WEA09)	21:35	113 20:46 (WEA04)	21:58	97 20:50 (WEA04)
27	08:19		07:19		06:12		18:01 (WEA02)	05:59	18:54 (WEA09)	05:07	18:53 (WEA09)	04:56	19:05 (WEA09)
	16:55		17:56		18:49	21	18:22 (WEA02)	20:46	66 20:00 (WEA09)	21:36	113 20:46 (WEA04)	21:58	97 20:50 (WEA04)
28	08:18		07:17		06:10		18:01 (WEA02)	05:57	18:53 (WEA09)	05:06	18:54 (WEA09)	04:56	19:05 (WEA09)
	16:57		17:58		18:51	23	18:24 (WEA02)	20:48	68 20:01 (WEA09)	21:37	111 20:46 (WEA04)	21:58	97 20:50 (WEA04)
29	08:16				07:07		19:02 (WEA02)	05:55	18:53 (WEA09)	05:05	18:54 (WEA09)	04:57	19:05 (WEA09)
	16:59				19:53	22	19:24 (WEA02)	20:49	68 20:01 (WEA09)	21:39	111 20:46 (WEA04)	21:58	99 20:51 (WEA04)
30	08:15				07:05		19:01 (WEA02)	05:53	18:52 (WEA09)	05:04	18:55 (WEA09)	04:57	19:05 (WEA09)
	17:01				19:54	21	19:22 (WEA02)	20:51	70 20:02 (WEA09)	21:40	109 20:46 (WEA04)	21:58	99 20:51 (WEA04)
31	08:13				07:02		19:02 (WEA02)			05:03	18:55 (WEA09)		
	17:03				19:56	19	19:21 (WEA02)			21:41	109 20:46 (WEA04)		
Sonnenscheinstunden	251		274		367			420		493		509	
astr.max.mögl.Beschattung						643		1086		3256		2989	
Red.Sonnenscheinwahrsch.						0,28		0,37		0,43		0,39	
Reduktion Betriebsdauer						0,95		0,95		0,95		0,95	
Reduktion Windrichtung						0,65		0,63		0,62		0,62	
Gesamte Reduktion						0,17		0,22		0,26		0,23	
Met.wahrsch.Beschattung						110		242		833		687	

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP32 - Driftweg 1, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September		Oktober		November	Dezember
1	04:58		19:05 (WEA09)	05:38		18:59 (WEA09)	06:31		19:44 (WEA03)	07:24		17:55 (WEA08)	07:22	08:17
	21:57	99	20:51 (WEA04)	21:22	110	20:51 (WEA04)	20:16	4	19:48 (WEA03)	19:03	31	18:26 (WEA08)	16:53	16:09
2	04:59		19:05 (WEA09)	05:39		18:59 (WEA09)	06:33			07:26		17:55 (WEA08)	07:24	08:18
	21:57	100	20:52 (WEA04)	21:21	109	20:50 (WEA04)	20:14			19:01	32	18:27 (WEA08)	16:51	16:08
3	05:00		19:05 (WEA09)	05:41		18:59 (WEA09)	06:35			07:28		17:54 (WEA08)	07:26	08:20
	21:57	100	20:51 (WEA04)	21:19	105	20:48 (WEA04)	20:12			18:58	32	18:26 (WEA08)	16:49	16:08
4	05:00		19:05 (WEA09)	05:43		18:59 (WEA09)	06:37			07:30		17:54 (WEA08)	07:28	08:21
	21:56	102	20:52 (WEA04)	21:17	102	20:46 (WEA04)	20:09			18:56	32	18:26 (WEA08)	16:47	16:07
5	05:01		19:05 (WEA09)	05:44		18:58 (WEA09)	06:38			07:31		17:54 (WEA08)	07:30	08:22
	21:56	102	20:52 (WEA04)	21:15	99	20:44 (WEA04)	20:07			18:53	31	18:25 (WEA08)	16:45	16:0(
6	05:02		19:05 (WEA09)	05:46		18:59 (WEA09)	06:40			07:33		17:55 (WEA08)	07:32	08:24
	21:55	104	20:53 (WEA04)	21:13	96	20:43 (WEA04)	20:04			18:51	28	18:23 (WEA08)	16:43	16:06
7	05:03		19:05 (WEA09)	05:48		18:58 (WEA09)	06:42			07:35		17:55 (WEA08)	07:34	08:25
	21:54	103	20:53 (WEA04)	21:11	92	20:40 (WEA04)	20:02			18:49	25	18:20 (WEA08)	16:42	16:05
8	05:04		19:04 (WEA09)	05:49		18:59 (WEA09)	06:44			07:37		17:55 (WEA08)	07:36	08:26
	21:54	106	20:54 (WEA04)	21:09	88	20:39 (WEA04)	20:00			18:46	22	18:17 (WEA08)	16:40	16:05
9	05:05		19:04 (WEA09)	05:51		18:59 (WEA09)	06:45		19:03 (WEA02)	07:39		17:56 (WEA08)	07:37	08:28
	21:53	106	20:54 (WEA04)	21:07	81	20:37 (WEA04)	19:57	3	19:06 (WEA02)	18:44	19	18:15 (WEA08)	16:38	16:05
10	05:06		19:04 (WEA09)	05:53		18:59 (WEA09)	06:47		18:58 (WEA02)	07:41		17:57 (WEA08)	07:39	08:29
	21:52	107	20:54 (WEA04)	21:05	72	20:11 (WEA09)	19:55	12	19:10 (WEA02)	18:41	15	18:12 (WEA08)	16:36	16:04
11	05:07		19:04 (WEA09)	05:55		18:59 (WEA09)	06:49		18:56 (WEA02)	07:42		17:58 (WEA08)	07:41	08:30
	21:51	107	20:54 (WEA04)	21:03	72	20:11 (WEA09)	19:52	16	19:12 (WEA02)	18:39	12	18:10 (WEA08)	16:35	16:04
12	05:09		19:04 (WEA09)	05:56		19:00 (WEA09)	06:51		18:54 (WEA02)	07:44		18:01 (WEA08)	07:43	08:31
	21:50	108	20:55 (WEA04)	21:01	70	20:10 (WEA09)	19:50	19	19:13 (WEA02)	18:37	7	18:08 (WEA08)	16:33	16:04
13	05:10		19:03 (WEA09)	05:58		19:00 (WEA09)	06:52		18:53 (WEA02)	07:46			07:45	08:32
	21:49	111	20:55 (WEA04)	20:59	69	20:09 (WEA09)	19:47	20	19:13 (WEA02)	18:34			16:31	16:04
14	05:11		19:03 (WEA09)	06:00		19:00 (WEA09)	06:54		18:52 (WEA02)	07:48			07:47	08:33
	21:48	111	20:55 (WEA04)	20:57	69	20:09 (WEA09)	19:45	22	19:14 (WEA02)	18:32			16:30	16:04
15	05:12		19:02 (WEA09)	06:02		19:00 (WEA09)	06:56		18:50 (WEA02)	07:50			07:49	08:34
	21:47	112	20:55 (WEA04)	20:55	67	20:07 (WEA09)	19:42	23	19:13 (WEA02)	18:30			16:28	16:04
16	05:14		19:03 (WEA09)	06:03		19:01 (WEA09)	06:58		18:50 (WEA02)	07:52			07:51	08:35
	21:46	112	20:56 (WEA04)	20:53	66	20:07 (WEA09)	19:40	22	19:12 (WEA02)	18:27			16:27	16:04
17	05:15		19:02 (WEA09)	06:05		19:02 (WEA09)	06:59		18:50 (WEA02)	07:53			07:53	08:36
	21:45	114	20:56 (WEA04)	20:51	65	20:07 (WEA03)	19:37	20	19:10 (WEA02)	18:25			16:25	16:04
18	05:16		19:02 (WEA09)	06:07		19:02 (WEA09)	07:01		18:50 (WEA02)	07:55			07:54	08:37
	21:44	114	20:56 (WEA04)	20:48	65	20:07 (WEA03)	19:35	18	19:08 (WEA02)	18:23			16:24	16:04
19	05:18		19:01 (WEA09)	06:09		19:03 (WEA09)	07:03		18:49 (WEA02)	07:57			07:56	08:37
	21:42	114	20:55 (WEA04)	20:46	65	20:08 (WEA03)	19:33	15	19:04 (WEA02)	18:21			16:22	16:05
20	05:19		19:02 (WEA09)	06:10		19:04 (WEA09)	07:05		18:50 (WEA02)	07:59			07:58	08:38
	21:41	114	20:56 (WEA04)	20:44	64	20:08 (WEA03)	19:30	12	19:02 (WEA02)	18:18			16:21	16:05
21	05:20		19:01 (WEA09)	06:12		19:04 (WEA09)	07:06		18:51 (WEA02)	08:01			08:00	08:39
	21:40	115	20:56 (WEA04)	20:42	64	20:08 (WEA03)	19:28	9	19:00 (WEA02)	18:16			16:20	16:05
22	05:22		19:01 (WEA09)	06:14		19:05 (WEA09)	07:08		18:51 (WEA02)	08:03			08:02	08:39
	21:38	114	20:55 (WEA04)	20:40	63	20:08 (WEA03)	19:25	6	18:57 (WEA02)	18:14			16:18	16:06
23	05:23		19:01 (WEA09)	06:16		19:07 (WEA09)	07:10		18:09 (WEA08)	08:05			08:03	08:40
	21:37	115	20:56 (WEA04)	20:37	61	20:08 (WEA03)	19:23	11	18:54 (WEA02)	18:12			16:17	16:06
24	05:25		19:00 (WEA09)	06:17		19:07 (WEA09)	07:12		18:05 (WEA08)	08:07			08:05	08:40
	21:36	115	20:55 (WEA04)	20:35	59	20:06 (WEA03)	19:20	17	18:22 (WEA08)	18:10			16:16	16:07
25	05:26		19:01 (WEA09)	06:19		19:09 (WEA09)	07:14		18:03 (WEA08)	07:09			08:07	08:40
	21:34	115	20:56 (WEA04)	20:33	55	20:04 (WEA03)	19:18	21	18:24 (WEA08)	17:07			16:15	16:08
26	05:28		19:00 (WEA09)	06:21		19:11 (WEA09)	07:15		18:02 (WEA08)	07:10			08:08	08:41
	21:32	115	20:55 (WEA04)	20:30	51	20:02 (WEA03)	19:15	24	18:26 (WEA08)	17:05			16:14	16:08
27	05:30		18:59 (WEA09)	06:23		19:13 (WEA09)	07:17		17:59 (WEA08)	07:12			08:10	08:41
	21:31	115	20:54 (WEA04)	20:28	46	19:59 (WEA03)	19:13	27	18:26 (WEA08)	17:03			16:13	16:09
28	05:31		19:00 (WEA09)	06:24		19:16 (WEA09)	07:19		17:58 (WEA08)	07:14			08:12	08:41
	21:29	114	20:54 (WEA04)	20:26	41	19:57 (WEA03)	19:10	28	18:26 (WEA08)	17:01			16:12	16:10
29	05:33		18:59 (WEA09)	06:26		19:19 (WEA09)	07:21		17:57 (WEA08)	07:16			08:13	08:41
	21:28	114	20:53 (WEA04)	20:23	36	19:55 (WEA03)	19:08	30	18:27 (WEA08)	16:59			16:11	16:11
30	05:34		18:59 (WEA09)	06:28		19:25 (WEA09)	07:22		17:57 (WEA08)	07:18			08:15	08:41
	21:26	113	20:53 (WEA04)	20:21	22	19:52 (WEA03)	19:06	30	18:27 (WEA08)	16:57			16:10	16:12
31	05:36		18:59 (WEA09)	06:30		19:41 (WEA03)				07:20				08:41
	21:24	112	20:52 (WEA04)	20:19	9	19:50 (WEA03)				16:55				16:13
Sonnenscheinstunden	511			459			382			329			260	234
astr.max.mögl.Beschattung		3403			2133			409			286			
Red.Sonnenscheinwahrsch.		0,38			0,42			0,35			0,29			
Reduktion Betriebsdauer		0,95			0,95			0,95			0,95			
Reduktion Windrichtung		0,62			0,63			0,65			0,65			
Gesamte Reduktion		0,22			0,25			0,22			0,18			
Met.wahrsch.Beschattung		765			539			88			52			

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP33 - Horn 23, 21769 Armstorf

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:40	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:09
3	08:41	08:08	07:10	06:55	05:47	05:01	05:00	05:41	06:35	07:28	07:26	08:20
	16:17	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:02	05:45	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:46	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:03	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:08	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:46	05:39	04:58	05:03	05:48	06:42	07:35	07:34	08:25
	16:22	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:38	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:36	04:56	05:06	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:07	05:53	06:47	07:41	07:40	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:37	16:05
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:04	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:57	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:19	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:31	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:48	18:35	16:32	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:13	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:04	06:58	07:52	07:51	08:35
	16:36	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:17	06:07	07:01	07:56	07:55	08:37
	16:39	17:39	18:33	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:05
19	08:30	07:37	06:32	06:17	05:19	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:23	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:11	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:16	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:06
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:19	16:06
23	08:25	07:28	06:22	06:08	05:13	04:55	05:24	06:16	07:10	08:05	08:04	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:38	19:23	18:12	16:17	16:07
24	08:24	07:26	06:20	06:06	05:11	04:55	05:25	06:18	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:41	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:46	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:56	05:28	06:21	07:16	07:11	08:09	08:41
	16:54	17:55	18:47	20:44	21:35	21:58	21:33	20:31	19:16	17:06	16:14	16:09
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:57	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:58	05:07	04:57	05:31	06:25	07:19	07:15	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:56	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:35	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:57		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP34 - Sticht 3, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März	April	Mai	Juni
1	08:42		09:29 (WEA12)	08:12		08:52 (WEA13)	07:15	07:00	05:51	05:02
	16:14	2	09:31 (WEA12)	17:05	10	09:02 (WEA13)	18:00	19:58	20:53	21:43
2	08:41		09:28 (WEA12)	08:10		08:53 (WEA13)	07:12	06:58	05:49	05:01
	16:15	5	09:33 (WEA12)	17:07	10	09:03 (WEA13)	18:02	20:00	20:55	21:44
3	08:41		09:28 (WEA12)	08:08		08:54 (WEA13)	07:10	06:55	05:47	05:00
	16:16	7	09:35 (WEA12)	17:09	8	09:02 (WEA13)	18:04	20:02	20:57	21:45
4	08:41		09:28 (WEA12)	08:07		08:56 (WEA13)	07:08	06:53	05:45	05:00
	16:18	7	09:35 (WEA12)	17:11	4	09:00 (WEA13)	18:06	20:04	20:59	21:46
5	08:41		09:28 (WEA12)	08:05			07:05	06:50	05:43	04:59
	16:19	9	09:37 (WEA12)	17:13			18:08	20:06	21:00	21:47
6	08:40		09:28 (WEA12)	08:03			07:03	06:48	05:41	04:58
	16:20	10	09:38 (WEA12)	17:15			18:10	20:08	21:02	21:48
7	08:40		09:28 (WEA12)	08:01			07:01	06:45	05:39	04:57
	16:21	11	09:39 (WEA12)	17:17			18:12	20:09	21:04	21:49
8	08:39		09:28 (WEA12)	07:59			06:58	06:43	05:37	04:57
	16:23	11	09:39 (WEA12)	17:19			18:14	20:11	21:06	21:50
9	08:39		09:28 (WEA12)	07:57			06:56	06:41	05:35	04:56
	16:24	12	09:40 (WEA12)	17:21			18:16	20:13	21:08	21:51
10	08:38		09:28 (WEA12)	07:55		08:34 (WEA10)	06:53	06:38	05:34	04:56
	16:26	12	09:40 (WEA12)	17:23	4	08:38 (WEA10)	18:18	20:15	21:09	21:52
11	08:37		09:28 (WEA12)	07:53		08:32 (WEA10)	06:51	06:36	05:32	04:55
	16:27	13	09:41 (WEA12)	17:25	8	08:40 (WEA10)	18:19	20:17	21:11	21:53
12	08:37		09:28 (WEA12)	07:51		08:31 (WEA10)	06:49	06:34	05:30	04:55
	16:29	13	09:41 (WEA12)	17:27	11	08:42 (WEA10)	18:21	20:19	21:13	21:54
13	08:36		09:28 (WEA12)	07:49		08:29 (WEA10)	06:46	06:31	05:28	04:55
	16:30	14	09:42 (WEA12)	17:29	12	08:41 (WEA10)	18:23	20:20	21:14	21:54
14	08:35		09:29 (WEA12)	07:47		08:29 (WEA10)	06:44	06:29	05:27	04:54
	16:32	13	09:42 (WEA12)	17:31	13	08:42 (WEA10)	18:25	20:22	21:16	21:55
15	08:34		09:30 (WEA12)	07:45		08:29 (WEA10)	06:41	06:27	05:25	04:54
	16:34	12	09:42 (WEA12)	17:33	13	08:42 (WEA10)	18:27	20:24	21:18	21:56
16	08:33		09:30 (WEA12)	07:43		08:30 (WEA10)	06:39	06:24	05:23	04:54
	16:35	13	09:43 (WEA12)	17:35	12	08:42 (WEA10)	18:29	20:26	21:19	21:56
17	08:32		09:31 (WEA12)	07:41		08:31 (WEA10)	06:37	06:22	05:22	04:54
	16:37	12	09:43 (WEA12)	17:37	10	08:41 (WEA10)	18:31	20:28	21:21	21:57
18	08:31		09:32 (WEA12)	07:39		08:31 (WEA10)	06:34	06:20	05:20	04:54
	16:39	11	09:43 (WEA12)	17:39	8	08:39 (WEA10)	18:33	20:30	21:23	21:57
19	08:30		09:33 (WEA12)	07:37			06:32	06:17	05:18	04:54
	16:41	9	09:42 (WEA12)	17:41			18:34	20:31	21:24	21:58
20	08:29		09:35 (WEA12)	07:35			06:29	06:15	05:17	04:54
	16:42	6	09:41 (WEA12)	17:43			18:36	20:33	21:26	21:58
21	08:28			07:33			06:27	06:13	05:15	04:54
	16:44			17:45			18:38	20:35	21:27	21:58
22	08:26			07:30			06:24	06:11	05:14	04:54
	16:46			17:47			18:40	20:37	21:29	21:58
23	08:25			07:28			06:22	06:08	05:13	04:54
	16:48			17:49			18:42	20:39	21:31	21:58
24	08:24			07:26			06:19	06:06	05:11	04:55
	16:50			17:51			18:44	20:41	21:32	21:59
25	08:22			07:24			06:17	06:04	05:10	04:55
	16:52			17:53			18:45	20:42	21:33	21:59
26	08:21			07:21			06:15	06:02	05:09	04:55
	16:53			17:55			18:47	20:44	21:35	21:59
27	08:20		08:54 (WEA13)	07:19			06:12	06:00	05:08	04:56
	16:55	5	08:59 (WEA13)	17:56			18:49	20:46	21:36	21:58
28	08:18		08:52 (WEA13)	07:17			06:10	05:58	05:06	04:56
	16:57	8	09:00 (WEA13)	17:58			18:51	20:48	21:38	21:58
29	08:17		08:52 (WEA13)				07:07	05:55	05:05	04:57
	16:59	10	09:02 (WEA13)				19:53	20:50	21:39	21:58
30	08:15		08:52 (WEA13)				07:05	05:53	05:04	04:58
	17:01	10	09:02 (WEA13)				19:55	20:51	21:40	21:58
31	08:13		08:52 (WEA13)				07:02		05:03	
	17:03	10	09:02 (WEA13)				19:57		21:42	
Sonnenscheinstunden	251			274			367	420	493	509
astr.max.mögl.Beschattung		245			123					
Red.Sonnenscheinwahrsch.		0,17			0,24					
Reduktion Betriebsdauer		0,95			0,95					
Reduktion Windrichtung		0,60			0,62					
Gesamte Reduktion		0,10			0,14					
Met.wahrsch.Beschattung		24			17					

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)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP34 - Sticht 3, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober			November			Dezember		
1	04:58	05:38	06:32	07:24			07:22		08:04 (WEA10)	08:17		09:10 (WEA12)
	21:58	21:23	20:17	19:03			16:53	3	08:07 (WEA10)	16:09	13	09:23 (WEA12)
2	04:59	05:39	06:33	07:26			07:24			08:18		09:11 (WEA12)
	21:57	21:21	20:14	19:01			16:51			16:08	13	09:24 (WEA12)
3	05:00	05:41	06:35	07:28			07:26			08:20		09:12 (WEA12)
	21:57	21:19	20:12	18:58			16:49			16:08	12	09:24 (WEA12)
4	05:01	05:43	06:37	07:30			07:28			08:21		09:12 (WEA12)
	21:56	21:17	20:09	18:56			16:47			16:07	12	09:24 (WEA12)
5	05:01	05:44	06:39	07:32			07:30			08:23		09:13 (WEA12)
	21:56	21:15	20:07	18:54			16:45			16:07	11	09:24 (WEA12)
6	05:02	05:46	06:40	07:33			07:32			08:24		09:14 (WEA12)
	21:55	21:13	20:05	18:51			16:44			16:06	10	09:24 (WEA12)
7	05:03	05:48	06:42	07:35			07:34		08:25 (WEA13)	08:25		09:14 (WEA12)
	21:55	21:12	20:02	18:49			16:42	5	08:30 (WEA13)	16:06	9	09:23 (WEA12)
8	05:04	05:50	06:44	07:37			07:36		08:24 (WEA13)	08:27		09:16 (WEA12)
	21:54	21:10	20:00	18:46			16:40	8	08:32 (WEA13)	16:05	8	09:24 (WEA12)
9	05:05	05:51	06:46	07:39			07:38		08:23 (WEA13)	08:28		09:16 (WEA12)
	21:53	21:08	19:57	18:44			16:38	10	08:33 (WEA13)	16:05	7	09:23 (WEA12)
10	05:06	05:53	06:47	07:41			07:40		08:23 (WEA13)	08:29		09:17 (WEA12)
	21:52	21:06	19:55	18:42			16:36	10	08:33 (WEA13)	16:04	5	09:22 (WEA12)
11	05:08	05:55	06:49	07:43			07:41		08:24 (WEA13)	08:30		09:20 (WEA12)
	21:51	21:04	19:52	18:39			16:35	10	08:34 (WEA13)	16:04	2	09:22 (WEA12)
12	05:09	05:56	06:51	07:44			07:43		08:24 (WEA13)	08:31		
	21:50	21:01	19:50	18:37			16:33	10	08:34 (WEA13)	16:04		
13	05:10	05:58	06:53	07:46			07:45		08:24 (WEA13)	08:32		
	21:50	20:59	19:48	18:35			16:31	10	08:34 (WEA13)	16:04		
14	05:11	06:00	06:54	07:48			07:47		08:25 (WEA13)	08:33		
	21:48	20:57	19:45	18:32			16:30	8	08:33 (WEA13)	16:04		
15	05:12	06:02	06:56	07:50			07:49		08:27 (WEA13)	08:34		
	21:47	20:55	19:43	18:30			16:28	5	08:32 (WEA13)	16:04		
16	05:14	06:03	06:58	07:52			07:51			08:35		
	21:46	20:53	19:40	18:28			16:27			16:04		
17	05:15	06:05	07:00	07:54			07:53			08:36		
	21:45	20:51	19:38	18:25			16:25			16:04		
18	05:16	06:07	07:01	07:56			07:55			08:37		
	21:44	20:49	19:35	18:23			16:24			16:04		
19	05:18	06:09	07:03	07:57			07:56			08:38		
	21:43	20:47	19:33	18:21			16:22			16:05		
20	05:19	06:10	07:05	07:59			07:58			08:38		
	21:41	20:44	19:30	18:19			16:21			16:05		
21	05:21	06:12	07:07	08:01			08:00			08:39		
	21:40	20:42	19:28	18:16			16:20			16:05		
22	05:22	06:14	07:08	08:03			08:02		09:11 (WEA12)	08:39		
	21:39	20:40	19:25	18:14			16:18	6	09:17 (WEA12)	16:06		
23	05:24	06:16	07:10	08:05		09:04 (WEA10)	08:04		09:10 (WEA12)	08:40		
	21:37	20:38	19:23	18:12	3	09:07 (WEA10)	16:17	9	09:19 (WEA12)	16:06		
24	05:25	06:18	07:12	08:07		09:01 (WEA10)	08:05		09:09 (WEA12)	08:40		
	21:36	20:35	19:20	18:10	9	09:10 (WEA10)	16:16	11	09:20 (WEA12)	16:07		
25	05:27	06:19	07:14	07:09		08:00 (WEA10)	08:07		09:09 (WEA12)	08:41		
	21:34	20:33	19:18	17:08	11	08:11 (WEA10)	16:15	12	09:21 (WEA12)	16:08		
26	05:28	06:21	07:16	07:11		07:59 (WEA10)	08:09		09:08 (WEA12)	08:41		
	21:33	20:31	19:16	17:06	12	08:11 (WEA10)	16:14	13	09:21 (WEA12)	16:08		
27	05:30	06:23	07:17	07:13		07:59 (WEA10)	08:10		09:09 (WEA12)	08:41		
	21:31	20:28	19:13	17:03	12	08:11 (WEA10)	16:13	13	09:22 (WEA12)	16:09		
28	05:31	06:25	07:19	07:15		07:59 (WEA10)	08:12		09:09 (WEA12)	08:41		
	21:30	20:26	19:11	17:01	12	08:11 (WEA10)	16:12	13	09:22 (WEA12)	16:10		
29	05:33	06:26	07:21	07:16		07:59 (WEA10)	08:14		09:10 (WEA12)	08:42		
	21:28	20:24	19:08	16:59	12	08:11 (WEA10)	16:11	13	09:23 (WEA12)	16:11		
30	05:34	06:28	07:23	07:18		07:59 (WEA10)	08:15		09:10 (WEA12)	08:42		
	21:26	20:21	19:06	16:57	11	08:10 (WEA10)	16:10	13	09:23 (WEA12)	16:12		
31	05:36	06:30		07:20		08:00 (WEA10)				08:42		
	21:24	20:19		16:55	9	08:09 (WEA10)				16:13		
Sonnenscheinstunden	511	459	382	329			260			234		
astr.max.mögl.Beschattung					91			182			102	
Red.Sonnenscheinwahrsch.					0,29			0,19			0,14	
Reduktion Betriebsdauer					0,95			0,95			0,95	
Reduktion Windrichtung					0,62			0,60			0,60	
Gesamte Reduktion					0,17			0,11			0,08	
Met.wahrsch.Beschattung					16			20			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) Schattenende	(WEA mit erstem Schatten) (WEA mit letztem Schatten)

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP35 - Neues Moor 19, 21770 Mittelstenahe

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember		
1	08:42		09:44 (WEA04)	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17		
	16:14	17	10:01 (WEA04)	17:05	18:00	19:58	20:53	21:43	21:58	21:23	20:17	19:03	16:53	16:09		
2	08:41		09:45 (WEA04)	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18		
	16:15	16	10:01 (WEA04)	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08		
3	08:41		09:47 (WEA04)	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20		
	16:16	15	10:02 (WEA04)	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08		
4	08:41		09:47 (WEA04)	08:06	07:08	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28	08:21		
	16:17	14	10:01 (WEA04)	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07		
5	08:41		09:49 (WEA04)	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23		09:38 (WEA04)
	16:19	12	10:01 (WEA04)	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:06	6	09:44 (WEA04)
6	08:40		09:50 (WEA04)	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24		09:36 (WEA04)
	16:20	10	10:00 (WEA04)	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:43	16:06	10	09:46 (WEA04)
7	08:40		09:52 (WEA04)	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25		09:35 (WEA04)
	16:21	6	09:58 (WEA04)	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05	12	09:47 (WEA04)
8	08:39			07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36	08:27		09:35 (WEA04)
	16:23			17:19	18:14	20:11	21:06	21:50	21:54	21:10	20:00	18:46	16:40	16:05	14	09:49 (WEA04)
9	08:39			07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28		09:35 (WEA04)
	16:24			17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05	15	09:50 (WEA04)
10	08:38			07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29		09:34 (WEA04)
	16:26			17:23	18:17	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36	16:04	16	09:50 (WEA04)
11	08:37			07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41	08:30		09:35 (WEA04)
	16:27			17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04	17	09:52 (WEA04)
12	08:37			07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31		09:35 (WEA04)
	16:29			17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04	18	09:53 (WEA04)
13	08:36			07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:53	07:46	07:45	08:32		09:35 (WEA04)
	16:30			17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04	18	09:53 (WEA04)
14	08:35			07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47	08:33		09:35 (WEA04)
	16:32			17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04	19	09:54 (WEA04)
15	08:34			07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34		09:36 (WEA04)
	16:34			17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04	19	09:55 (WEA04)
16	08:33			07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35		09:36 (WEA04)
	16:35			17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04	20	09:56 (WEA04)
17	08:32			07:41	06:36	06:22	05:21	04:54	05:15	06:05	07:00	07:54	07:53	08:36		09:35 (WEA04)
	16:37			17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04	20	09:55 (WEA04)
18	08:31			07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:55	08:37		09:36 (WEA04)
	16:39			17:39	18:32	20:30	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04	20	09:56 (WEA04)
19	08:30			07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:38		09:37 (WEA04)
	16:40			17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05	20	09:57 (WEA04)
20	08:29			07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38		09:37 (WEA04)
	16:42			17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05	21	09:58 (WEA04)
21	08:28			07:33	06:27	06:13	05:15	04:54	05:20	06:12	07:07	08:01	08:00	08:39		09:37 (WEA04)
	16:44			17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05	21	09:58 (WEA04)
22	08:26			07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39		09:38 (WEA04)
	16:46			17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06	21	09:59 (WEA04)
23	08:25			07:28	06:22	06:08	05:13	04:54	05:23	06:16	07:10	08:05	08:04	08:40		09:38 (WEA04)
	16:48			17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06	21	09:59 (WEA04)
24	08:24			07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40		09:39 (WEA04)
	16:50			17:51	18:44	20:40	21:32	21:59	21:36	20:35	19:20	18:10	16:16	16:07	20	09:59 (WEA04)
25	08:22			07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07	08:41		09:40 (WEA04)
	16:51			17:52	18:45	20:42	21:33	21:59	21:34	20:33	19:18	17:08	16:15	16:08	20	10:00 (WEA04)
26	08:21			07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41		09:40 (WEA04)
	16:53			17:54	18:47	20:44	21:35	21:59	21:33	20:31	19:15	17:05	16:14	16:08	20	10:00 (WEA04)
27	08:19			07:19	06:12	06:00	05:07	04:56	05:30	06:23	07:17	07:13	08:10	08:41		09:41 (WEA04)
	16:55			17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09	19	10:00 (WEA04)
28	08:18			07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12	08:41		09:41 (WEA04)
	16:57			17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10	20	10:01 (WEA04)
29	08:16				07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:42		09:42 (WEA04)
	16:59				19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11	19	10:01 (WEA04)
30	08:15				07:05	05:53	05:04	04:57	05:34	06:28	07:23	07:18	08:15	08:42		09:43 (WEA04)
	17:01				19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12	18	10:01 (WEA04)
31	08:13				07:02		05:03		05:36	06:30		07:20		08:42		09:44 (WEA04)
	17:03				19:56		21:42		21:24	20:19		16:55		16:13	18	10:02 (WEA04)
Sonnenscheinstunden	251			274	367	420	493	509	511	459	382	329	260	234		
astr.max.mögl.Beschattung		90													482	
Red.Sonnenscheinwahrsch.		0,17													0,14	
Reduktion Betriebsdauer		0,95													0,95	
Reduktion Windrichtung		0,61													0,61	
Gesamte Reduktion		0,10													0,08	
Met.wahrsch.Beschattung		9													39	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April	Mai	Juni
1	08:41		09:23 (WEA05)	08:12		09:32 (WEA05)	07:14	07:39 (WEA06)	07:00	05:51	05:02
	16:14	120	15:05 (WEA02)	17:05	59	15:59 (WEA11)	18:00	33	08:12 (WEA06)	19:58	20:53	21:43
2	08:41		09:23 (WEA05)	08:10		09:33 (WEA05)	07:12		07:38 (WEA06)	06:57	05:49	05:01
	16:15	119	15:06 (WEA02)	17:07	56	15:59 (WEA11)	18:02	35	08:13 (WEA06)	20:00	20:55	21:44
3	08:41		09:24 (WEA05)	08:08		09:34 (WEA05)	07:10		07:36 (WEA06)	06:55	05:47	05:00
	16:16	116	15:06 (WEA02)	17:09	52	15:58 (WEA11)	18:04	37	08:13 (WEA06)	20:02	20:57	21:45
4	08:41		09:24 (WEA05)	08:06		09:36 (WEA05)	07:08		07:36 (WEA06)	06:53	05:45	04:59
	16:17	110	15:05 (WEA02)	17:11	46	15:57 (WEA11)	18:06	38	08:14 (WEA06)	20:04	20:59	21:46
5	08:41		09:24 (WEA05)	08:05		09:37 (WEA05)	07:05		07:34 (WEA06)	06:50	05:43	04:59
	16:19	107	15:05 (WEA02)	17:13	37	10:14 (WEA05)	18:08	39	08:13 (WEA06)	20:06	21:00	21:47
6	08:40		09:24 (WEA05)	08:03		09:38 (WEA05)	07:03		07:34 (WEA06)	06:48	05:41	04:58
	16:20	101	15:04 (WEA02)	17:15	35	10:13 (WEA05)	18:10	40	08:14 (WEA06)	20:07	21:02	21:48
7	08:40		09:24 (WEA05)	08:01		09:40 (WEA05)	07:00		07:34 (WEA06)	06:45	05:39	04:57
	16:21	93	15:03 (WEA02)	17:17	31	10:11 (WEA05)	18:12	40	08:14 (WEA06)	20:09	21:04	21:49
8	08:39		09:25 (WEA05)	07:59		09:42 (WEA05)	06:58		07:33 (WEA06)	06:43	05:37	04:57
	16:23	80	15:02 (WEA02)	17:19	28	10:10 (WEA05)	18:14	41	08:14 (WEA06)	20:11	21:06	21:50
9	08:39		09:25 (WEA05)	07:57		09:44 (WEA05)	06:56		07:34 (WEA06)	06:41	05:35	04:56
	16:24	74	14:47 (WEA03)	17:21	23	10:07 (WEA05)	18:16	40	08:14 (WEA06)	20:13	21:07	21:51
10	08:38		09:25 (WEA05)	07:55		09:47 (WEA05)	06:53		07:33 (WEA06)	06:38	05:34	04:56
	16:26	73	14:47 (WEA03)	17:23	22	16:49 (WEA10)	18:17	40	08:13 (WEA06)	20:15	21:09	21:52
11	08:37		09:25 (WEA05)	07:53		09:52 (WEA05)	06:51		07:33 (WEA06)	06:36	05:32	04:55
	16:27	72	14:46 (WEA03)	17:25	14	16:50 (WEA10)	18:19	40	08:13 (WEA06)	20:17	21:11	21:53
12	08:37		09:25 (WEA05)	07:51		16:40 (WEA10)	06:49		07:33 (WEA06)	06:33	05:30	04:55
	16:29	71	14:46 (WEA03)	17:27	11	16:51 (WEA10)	18:21	38	08:11 (WEA06)	20:18	21:13	21:54
13	08:36		09:25 (WEA05)	07:49		16:40 (WEA10)	06:46		07:34 (WEA06)	06:31	05:28	04:54
	16:30	69	14:45 (WEA03)	17:29	12	16:52 (WEA10)	18:23	37	08:11 (WEA06)	20:20	21:14	21:54
14	08:35		09:25 (WEA05)	07:47		16:40 (WEA10)	06:44		07:34 (WEA06)	06:29	05:26	04:54
	16:32	72	15:52 (WEA13)	17:31	12	16:52 (WEA10)	18:25	35	08:09 (WEA06)	20:22	21:16	21:55
15	08:34		09:26 (WEA05)	07:45		16:40 (WEA10)	06:41		07:35 (WEA06)	06:26	05:25	04:54
	16:34	70	15:54 (WEA13)	17:33	12	16:52 (WEA10)	18:27	33	08:08 (WEA06)	20:24	21:18	21:56
16	08:33		09:26 (WEA05)	07:43		16:41 (WEA10)	06:39		07:36 (WEA06)	06:24	05:23	04:54
	16:35	66	15:55 (WEA13)	17:35	10	16:51 (WEA10)	18:29	31	08:07 (WEA06)	20:26	21:19	21:56
17	08:32		09:26 (WEA05)	07:41		16:42 (WEA10)	06:36		07:36 (WEA06)	06:22	05:21	04:54
	16:37	61	15:56 (WEA13)	17:37	9	16:51 (WEA10)	18:31	29	08:05 (WEA06)	20:28	21:21	21:57
18	08:31		09:26 (WEA05)	07:39		16:44 (WEA10)	06:34		07:38 (WEA06)	06:20	05:20	04:54
	16:39	61	15:56 (WEA13)	17:39	3	16:47 (WEA10)	18:32	25	08:03 (WEA06)	20:29	21:23	21:57
19	08:30		09:26 (WEA05)	07:37			06:32		07:40 (WEA06)	06:17	05:18	04:54
	16:40	63	15:57 (WEA13)	17:41			18:34	20	08:00 (WEA06)	20:31	21:24	21:57
20	08:29		09:27 (WEA05)	07:35			06:29		07:43 (WEA06)	06:15	05:17	04:54
	16:42	63	15:58 (WEA13)	17:43			18:36	14	07:57 (WEA06)	20:33	21:26	21:58
21	08:28		09:27 (WEA05)	07:32			06:27			06:13	05:15	04:54
	16:44	62	15:58 (WEA13)	17:45			18:38			20:35	21:27	21:58
22	08:26		09:27 (WEA05)	07:30			06:24			06:10	05:14	04:54
	16:46	63	15:58 (WEA13)	17:47			18:40			20:37	21:29	21:58
23	08:25		09:27 (WEA05)	07:28		07:55 (WEA06)	06:22			06:08	05:13	04:54
	16:48	63	15:57 (WEA13)	17:49	1	07:56 (WEA06)	18:42			20:39	21:30	21:58
24	08:24		09:28 (WEA05)	07:26		07:51 (WEA06)	06:19			06:06	05:11	04:55
	16:49	64	15:58 (WEA13)	17:50	13	08:04 (WEA06)	18:44			20:40	21:32	21:58
25	08:22		09:28 (WEA05)	07:24		07:48 (WEA06)	06:17			06:04	05:10	04:55
	16:51	64	15:58 (WEA11)	17:52	18	08:06 (WEA06)	18:45			20:42	21:33	21:58
26	08:21		09:29 (WEA05)	07:21		07:46 (WEA06)	06:14			06:02	05:09	04:55
	16:53	65	15:59 (WEA11)	17:54	22	08:08 (WEA06)	18:47			20:44	21:35	21:58
27	08:19		09:29 (WEA05)	07:19		07:44 (WEA06)	06:12			06:00	05:07	04:56
	16:55	65	15:59 (WEA11)	17:56	26	08:10 (WEA06)	18:49			20:46	21:36	21:58
28	08:18		09:30 (WEA05)	07:17		07:41 (WEA06)	06:10			05:57	05:06	04:56
	16:57	64	15:59 (WEA11)	17:58	30	08:11 (WEA06)	18:51			20:48	21:38	21:58
29	08:16		09:31 (WEA05)				07:07			05:55	05:05	04:57
	16:59	63	16:00 (WEA11)				19:53			20:50	21:39	21:58
30	08:15		09:31 (WEA05)				07:05			05:53	05:04	04:57
	17:01	63	16:00 (WEA11)				19:55			20:51	21:40	21:58
31	08:13		09:32 (WEA05)				07:02				05:03	
	17:03	61	16:00 (WEA11)				19:56				21:41	
Sonnenscheinstunden	251			274			367		420	493	509	
astr.max.mögl.Beschattung		2358			582			685				
Red.Sonnenscheinwahrsch.		0,17			0,24			0,28				
Reduktion Betriebsdauer		0,95			0,95			0,95				
Reduktion Windrichtung		0,63			0,62			0,62				
Gesamte Reduktion		0,10			0,14			0,16				
Met.wahrsch.Beschattung		240			82			112				

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP36 - Haneworth 2, 21770 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September			Oktober			November			Dezember		
1	04:58		05:38		06:31			07:24		08:13 (WEA06)	07:22		09:15 (WEA05)	08:17		09:07 (WEA05)
	21:57		21:23		20:16			19:03	38	08:51 (WEA06)	16:53	23	16:17 (WEA10)	16:09	72	14:28 (WEA03)
2	04:59		05:39		06:33			07:26		08:11 (WEA06)	07:24		09:12 (WEA05)	08:18		09:08 (WEA05)
	21:57		21:21		20:14			19:01	39	08:50 (WEA06)	16:51	24	09:36 (WEA05)	16:08	73	14:30 (WEA03)
3	05:00		05:41		06:35			07:28		08:11 (WEA06)	07:26		09:11 (WEA05)	08:20		09:08 (WEA05)
	21:57		21:19		20:12			18:58	39	08:50 (WEA06)	16:49	29	09:40 (WEA05)	16:08	74	14:30 (WEA03)
4	05:00		05:43		06:37			07:30		08:11 (WEA06)	07:28		09:09 (WEA05)	08:21		09:09 (WEA05)
	21:56		21:17		20:09			18:56	40	08:51 (WEA06)	16:47	32	09:41 (WEA05)	16:07	79	14:46 (WEA02)
5	05:01		05:44		06:38			07:31		08:10 (WEA06)	07:30		09:08 (WEA05)	08:23		09:09 (WEA05)
	21:56		21:15		20:07			18:53	41	08:51 (WEA06)	16:45	35	09:43 (WEA05)	16:06	92	14:48 (WE
6	05:02		05:46		06:40			07:33		08:10 (WEA06)	07:32		09:06 (WEA05)	08:24		09:10 (WE
	21:55		21:13		20:04			18:51	40	08:50 (WEA06)	16:43	38	09:44 (WEA05)	16:06	101	14:50 (WEA02)
7	05:03		05:48		06:42			07:35		08:10 (WEA06)	07:34		09:05 (WEA05)	08:25		09:10 (WEA05)
	21:54		21:11		20:02			18:49	40	08:50 (WEA06)	16:42	48	15:27 (WEA11)	16:05	107	14:51 (WEA02)
8	05:04		05:49		06:44			07:37		08:09 (WEA06)	07:36		09:04 (WEA05)	08:27		09:12 (WEA05)
	21:54		21:09		20:00			18:46	40	08:49 (WEA06)	16:40	52	15:28 (WEA11)	16:05	110	14:53 (WEA02)
9	05:05		05:51		06:45			07:39		08:09 (WEA06)	07:38		09:04 (WEA05)	08:28		09:12 (WEA05)
	21:53		21:07		19:57			18:44	39	08:48 (WEA06)	16:38	57	15:30 (WEA11)	16:05	116	14:54 (WEA02)
10	05:06		05:53		06:47			07:41		08:10 (WEA06)	07:39		09:03 (WEA05)	08:29		09:12 (WEA05)
	21:52		21:05		19:55			18:42	38	08:48 (WEA06)	16:36	59	15:30 (WEA11)	16:04	119	14:55 (WEA02)
11	05:07		05:55		06:49			07:42		08:10 (WEA06)	07:41		09:02 (WEA05)	08:30		09:13 (WEA05)
	21:51		21:03		19:52			18:39	37	08:47 (WEA06)	16:35	62	15:31 (WEA11)	16:04	120	14:55 (WEA02)
12	05:09		05:56		06:51			07:44		08:11 (WEA06)	07:43		09:02 (WEA05)	08:31		09:14 (WEA05)
	21:50		21:01		19:50			18:37	35	08:46 (WEA06)	16:33	63	15:31 (WEA11)	16:04	122	14:57 (WEA02)
13	05:10		05:58		06:52			07:46		08:13 (WEA06)	07:45		09:03 (WEA05)	08:32		09:15 (WEA05)
	21:49		20:59		19:47			18:34	32	08:45 (WEA06)	16:31	63	15:32 (WEA11)	16:04	124	14:58 (WEA02)
14	05:11		06:00		06:54			07:48		08:15 (WEA06)	07:47		09:02 (WEA05)	08:33		09:16 (WEA05)
	21:48		20:57		19:45			18:32	28	08:43 (WEA06)	16:30	65	15:32 (WEA11)	16:04	124	14:58 (WEA02)
15	05:12		06:02		06:56			07:50		08:17 (WEA06)	07:49		09:02 (WEA05)	08:34		09:16 (WEA05)
	21:47		20:55		19:42			18:30	25	08:42 (WEA06)	16:28	65	15:32 (WEA11)	16:04	125	14:59 (WEA02)
16	05:14		06:03		06:58			07:52		08:19 (WEA06)	07:51		09:02 (WEA05)	08:35		09:17 (WEA05)
	21:46		20:53		19:40			18:28	21	08:40 (WEA06)	16:27	65	15:32 (WEA11)	16:04	125	15:00 (WEA02)
17	05:15		06:05		06:59			07:54		08:21 (WEA06)	07:53		09:02 (WEA05)	08:36		09:17 (WEA05)
	21:45		20:51		19:38			18:25	16	08:37 (WEA06)	16:25	65	15:32 (WEA11)	16:04	126	15:00 (WEA02)
18	05:16		06:07		07:01			07:55		08:23 (WEA06)	07:54		09:02 (WEA05)	08:37		09:17 (WEA05)
	21:44		20:49		19:35			18:23	10	08:33 (WEA06)	16:24	64	15:32 (WEA13)	16:04	126	15:00 (WEA02)
19	05:18		06:09		07:03			07:57			07:56		09:02 (WEA05)	08:37		09:18 (WEA05)
	21:43		20:46		19:33			18:21			16:22	63	15:32 (WEA13)	16:05	127	15:01 (WEA02)
20	05:19		06:10		07:05			07:59			07:58		09:02 (WEA05)	08:38		09:18 (WEA05)
	21:41		20:44		19:30			18:18			16:21	63	15:33 (WEA13)	16:05	127	15:01 (WEA02)
21	05:20		06:12		07:07			08:01			08:00		09:03 (WEA05)	08:39		09:19 (WE
	21:40		20:42		19:28			18:16			16:20	62	15:34 (WEA13)	16:05	127	15:02 (WE
22	05:22		06:14		07:08			08:03			08:02		09:03 (WEA05)	08:39		09:19 (WEA05)
	21:39		20:40		19:25			18:14			16:18	63	15:34 (WEA13)	16:06	127	15:02 (WEA02)
23	05:23		06:16		07:10		08:28 (WEA06)	08:05			08:03		09:03 (WEA05)	08:40		09:20 (WEA05)
	21:37		20:37		19:23	11	08:39 (WEA06)	18:12			16:17	62	15:34 (WEA13)	16:06	127	15:03 (WEA02)
24	05:25		06:17		07:12		08:24 (WEA06)	08:07		17:13 (WEA10)	08:05		09:04 (WEA05)	08:40		09:20 (WEA05)
	21:36		20:35		19:20	19	08:43 (WEA06)	18:10	6	17:19 (WEA10)	16:16	61	15:34 (WEA13)	16:07	127	15:03 (WEA02)
25	05:26		06:19		07:14		08:22 (WEA06)	07:09		16:11 (WEA10)	08:07		09:03 (WEA05)	08:41		09:20 (WEA05)
	21:34		20:33		19:18	23	08:45 (WEA06)	17:07	9	16:20 (WEA10)	16:15	61	15:33 (WEA13)	16:08	127	15:03 (WEA02)
26	05:28		06:21		07:15		08:20 (WEA06)	07:11		16:10 (WEA10)	08:09		09:04 (WEA05)	08:41		09:22 (WEA05)
	21:33		20:31		19:15	27	08:47 (WEA06)	17:05	11	16:21 (WEA10)	16:14	66	15:33 (WEA13)	16:08	127	15:05 (WEA02)
27	05:30		06:23		07:17		08:17 (WEA06)	07:12		16:10 (WEA10)	08:10		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:31		20:28		19:13	31	08:48 (WEA06)	17:03	11	16:21 (WEA10)	16:13	70	15:33 (WEA13)	16:09	126	15:05 (WEA02)
28	05:31		06:24		07:19		08:16 (WEA06)	07:14		16:09 (WEA10)	08:12		09:05 (WEA05)	08:41		09:22 (WEA05)
	21:29		20:26		19:10	33	08:49 (WEA06)	17:01	12	16:21 (WEA10)	16:12	72	15:32 (WEA13)	16:10	126	15:05 (WEA02)
29	05:33		06:26		07:21		08:15 (WEA06)	07:16		16:09 (WEA10)	08:14		09:06 (WEA05)	08:41		09:22 (WEA05)
	21:28		20:24		19:08	35	08:50 (WEA06)	16:59	12	16:21 (WEA10)	16:11	69	14:26 (WEA03)	16:11	124	15:05 (WEA02)
30	05:34		06:28		07:23		08:14 (WEA06)	07:18		16:10 (WEA10)	08:15		09:06 (WEA05)	08:41		09:23 (WEA05)
	21:26		20:21		19:06	36	08:50 (WEA06)	16:57	10	16:20 (WEA10)	16:10	71	14:27 (WEA03)	16:12	124	15:06 (WEA02)
31	05:36		06:30					07:20		09:20 (WEA05)				08:41		09:23 (WEA05)
	21:24		20:19					16:55	17	16:19 (WEA10)				16:13	123	15:06 (WEA02)
Sonnenscheinstunden	511		459		382			329			260			234		
astr.max.mögl.Beschattung						215			686			1692			3574	
Red.Sonnenscheinwahrsch.						0,35			0,29			0,19			0,14	
Reduktion Betriebsdauer						0,95			0,95			0,95			0,95	
Reduktion Windrichtung						0,62			0,63			0,62			0,64	
Gesamte Reduktion						0,21			0,17			0,11			0,09	
Met.wahrsch.Beschattung						44			120			193			305	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung **Schattenrezeptor:** IP37 - Mittelstenaher Str. 32, 21769 Lamstedt

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November			Dezember		
1	08:41		12:55 (WEA06)	08:11	07:14	07:00	05:51	05:02	04:58	05:38	06:31	07:24	07:22			08:17		12:43 (WEA06)
	16:14	108	15:36 (WEA04)	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53			16:09	110	15:33 (WEA04)
2	08:41		12:56 (WEA06)	08:10	07:12	06:57	05:49	05:01	04:59	05:39	06:33	07:26	07:24			08:18		12:44 (WEA06)
	16:15	110	15:38 (WEA04)	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51			16:08	111	15:33 (WEA04)
3	08:41		12:57 (WEA06)	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26			08:20		12:43 (WEA06)
	16:16	109	15:39 (WEA04)	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49			16:08	112	15:31 (WEA04)
4	08:41		12:57 (WEA06)	08:06	07:07	06:53	05:45	04:59	05:00	05:43	06:37	07:30	07:28			08:21		12:44 (WEA06)
	16:17	110	15:40 (WEA04)	17:11	18:06	20:04	20:58	21:46	21:56	21:17	20:09	18:56	16:47			16:07	111	15:31 (WEA04)
5	08:40		12:58 (WEA06)	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:38	07:31	07:30			08:22		12:43 (WEA06)
	16:19	111	15:42 (WEA04)	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45			16:06	111	15:29 (WEA04)
6	08:40		12:58 (WEA06)	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32			08:24		12:44 (WEA06)
	16:20	111	15:43 (WEA04)	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43			16:06	111	15:29 (WEA04)
7	08:40		12:58 (WEA06)	08:01	07:00	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34			08:25		12:44 (WEA06)
	16:21	111	15:44 (WEA04)	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:41			16:05	111	15:28 (WEA04)
8	08:39		13:00 (WEA06)	07:59	06:58	06:43	05:37	04:57	05:04	05:49	06:44	07:37	07:36			08:26		12:45 (WEA06)
	16:23	111	15:47 (WEA04)	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40			16:05	110	15:28 (WEA04)
9	08:39		13:00 (WEA06)	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:45	07:39	07:37			08:28		12:45 (WEA06)
	16:24	112	15:48 (WEA04)	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38			16:05	111	15:28 (WEA04)
10	08:38		13:00 (WEA06)	07:55	06:53	06:38	05:33	04:55	05:06	05:53	06:47	07:41	07:39			08:29		12:45 (WEA06)
	16:26	111	15:49 (WEA04)	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:41	16:36			16:04	110	15:27 (WEA04)
11	08:37		13:01 (WEA06)	07:53	06:51	06:36	05:32	04:55	05:07	05:55	06:49	07:42	07:41			08:30		12:45 (WEA06)
	16:27	111	15:51 (WEA04)	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:34			16:04	108	15:26 (WEA04)
12	08:37		13:02 (WEA06)	07:51	06:48	06:33	05:30	04:55	05:08	05:56	06:51	07:44	07:43		12:59 (WEA06)	08:31		12:46 (WEA06)
	16:29	110	15:53 (WEA04)	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	18	13:17 (WEA06)	16:04	110	15:27 (WEA04)
13	08:36		13:02 (WEA06)	07:49	06:46	06:31	05:28	04:54	05:10	05:58	06:52	07:46	07:45		12:57 (WEA06)	08:32		12:47 (WEA06)
	16:30	108	15:53 (WEA04)	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:34	16:31	24	13:21 (WEA06)	16:04	108	15:27 (WEA04)
14	08:35		13:03 (WEA06)	07:47	06:44	06:29	05:26	04:54	05:11	06:00	06:54	07:48	07:47		12:54 (WEA06)	08:33		12:47 (WEA06)
	16:32	105	15:54 (WEA04)	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	30	13:24 (WEA06)	16:04	109	15:27 (WEA04)
15	08:34		13:04 (WEA06)	07:45	06:41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49		12:52 (WEA06)	08:34		12:47 (WEA06)
	16:33	102	15:54 (WEA04)	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	34	13:26 (WEA06)	16:04	108	15:27 (WEA04)
16	08:33		13:05 (WEA06)	07:43	06:39	06:24	05:23	04:54	05:13	06:03	06:58	07:52	07:51		12:51 (WEA06)	08:35		12:48 (WEA06)
	16:35	97	15:54 (WEA04)	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	45	15:22 (WEA04)	16:04	108	15:27 (WEA04)
17	08:32		13:06 (WEA06)	07:41	06:36	06:22	05:21	04:54	05:15	06:05	06:59	07:53	07:53		12:49 (WEA06)	08:36		12:47 (WEA06)
	16:37	92	15:55 (WEA04)	17:37	18:30	20:28	21:21	21:57	21:45	20:51	19:37	18:25	16:25	52	15:24 (WEA04)	16:04	108	15:26 (WEA04)
18	08:31		13:06 (WEA06)	07:39	06:34	06:19	05:20	04:54	05:16	06:07	07:01	07:55	07:54		12:48 (WEA06)	08:37		12:48 (WEA06)
	16:39	83	15:54 (WEA04)	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	59	15:26 (WEA04)	16:04	107	15:26 (WEA04)
19	08:30		13:08 (WEA06)	07:37	06:31	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56		12:47 (WEA06)	08:37		12:49 (WEA06)
	16:40	74	15:54 (WEA04)	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	64	15:28 (WEA04)	16:04	107	15:27 (WEA04)
20	08:29		13:09 (WEA06)	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58		12:46 (WEA06)	08:38		12:49 (WEA06)
	16:42	73	15:55 (WEA04)	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:18	16:21	67	15:29 (WEA04)	16:05	107	15:27 (WEA04)
21	08:28		13:10 (WEA06)	07:32	06:27	06:13	05:15	04:54	05:20	06:12	07:06	08:01	08:00		12:46 (WEA06)	08:39		12:50 (WEA06)
	16:44	70	15:54 (WEA04)	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	70	15:30 (WEA04)	16:05	106	15:27 (WEA04)
22	08:26		13:11 (WEA06)	07:30	06:24	06:10	05:14	04:54	05:22	06:14	07:08	08:03	08:02		12:45 (WEA06)	08:39		12:50 (WEA06)
	16:46	67	15:54 (WEA04)	17:46	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	73	15:31 (WEA04)	16:06	106	15:27 (WEA04)
23	08:25		13:12 (WEA06)	07:28	06:22	06:08	05:12	04:54	05:23	06:16	07:10	08:05	08:03		12:45 (WEA06)	08:40		12:51 (WEA06)
	16:48	64	15:53 (WEA04)	17:48	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	74	15:31 (WEA04)	16:06	107	15:29 (WEA04)
24	08:24		13:14 (WEA06)	07:26	06:19	06:06	05:11	04:54	05:25	06:17	07:12	08:07	08:05		12:44 (WEA06)	08:40		12:51 (WEA06)
	16:49	59	15:52 (WEA04)	17:50	18:43	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	81	15:32 (WEA04)	16:07	107	15:29 (WEA04)
25	08:22		13:15 (WEA06)	07:24	06:17	06:04	05:10	04:55	05:26	06:19	07:14	07:09	08:07		12:43 (WEA06)	08:41		12:51 (WEA06)
	16:51	52	15:50 (WEA04)	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:07	16:15	91	15:32 (WEA04)	16:07	106	15:29 (WEA04)
26	08:21		13:18 (WEA06)	07:21	06:14	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09		12:43 (WEA06)	08:41		12:52 (WEA06)
	16:53	45	15:49 (WEA04)	17:54	18:47	20:44	21:35	21:58	21:33	20:30	19:15	17:05	16:14	96	15:32 (WEA04)	16:08	108	15:31 (WEA04)
27	08:19		13:19 (WEA06)	07:19	06:12	05:59	05:07	04:56	05:29	06:23	07:17	07:12	08:10		12:43 (WEA06)	08:41		12:53 (WEA06)
	16:55	34	13:53 (WEA06)	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	101	15:33 (WEA04)	16:09	108	15:31 (WEA04)
28	08:18		13:21 (WEA06)	07:17	06:10	05:57	05:06	04:56	05:31	06:24	07:19	07:14	08:12		12:43 (WEA06)	08:41		12:53 (WEA06)
	16:57	30	13:51 (WEA06)	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:10	17:01	16:12	105	15:34 (WEA04)	16:10	107	15:32 (WEA04)
29	08:16		13:25 (WEA06)		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13		12:43 (WEA06)	08:41		12:54 (WEA06)
	16:59	24	13:49 (WEA06)		19:53	20:49	21:39	21:58	21:28	20:23	19:08	16:59	16:11	108	15:34 (WEA04)	16:11	108	15:33 (WEA04)
30	08:15		13:29 (WEA06)		07:05	05:53	05:04	04:57	05:34	06:28	07:22	07:18	08:15		12:43 (WEA06)	08:41		12:54 (WEA06)
	17:01	16	13:45 (WEA06)		19:54	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	110	15:34 (WEA04)	16:12	109	15:34 (WEA04)
31	08:13				07:02		05:03		05:36	06:30		07:20				08:41		12:55 (WEA06)
	17:03				19:56		21:41		21:24	20:19		16:55				16:13	109	15:36 (WEA04)
Sonnenscheinstunden	251			274	367	420	493	509	511	459	382	329	260			234		
astr.max.mögl.Beschattung		2520												1302			3369	
Red.Sonnenscheinwahrsch.		0,17												0,19			0,14	
Reduktion Betriebsdauer		0,95												0,95			0,95	
Reduktion Windrichtung		0,65												0,65			0,65	
Gesamte Reduktion		0,11												0,12			0,09	
Met.wahrsch.Beschattung		266												156			293	

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)

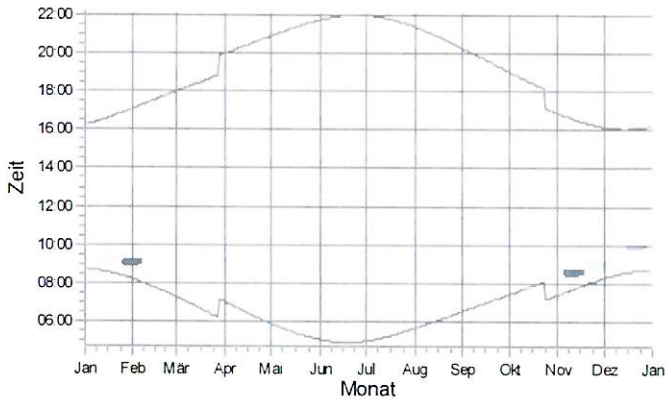
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

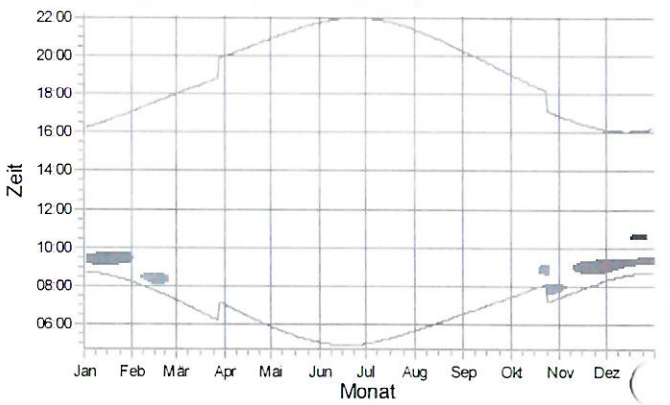
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

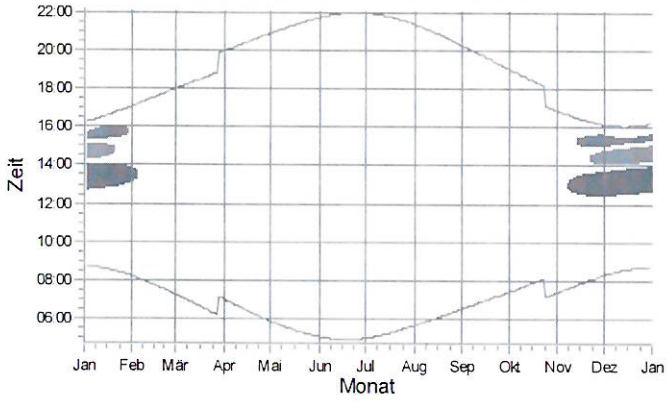
IP01: Sticht 1, 21770 Mittelstenahe



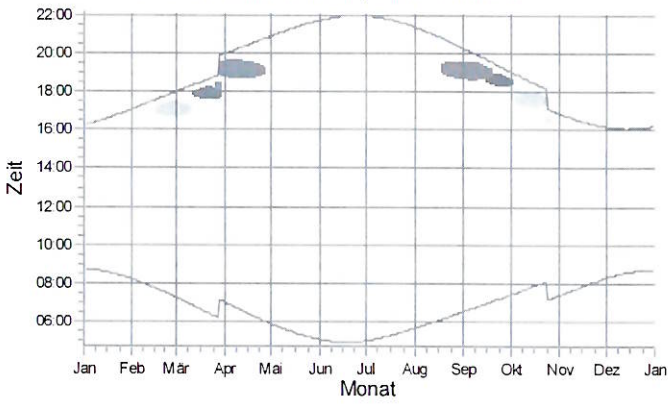
IP02: Neues Moor 21, 21770 Mittelstenahe



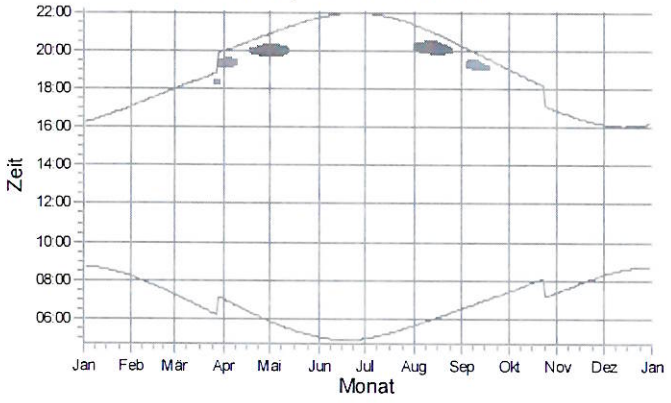
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



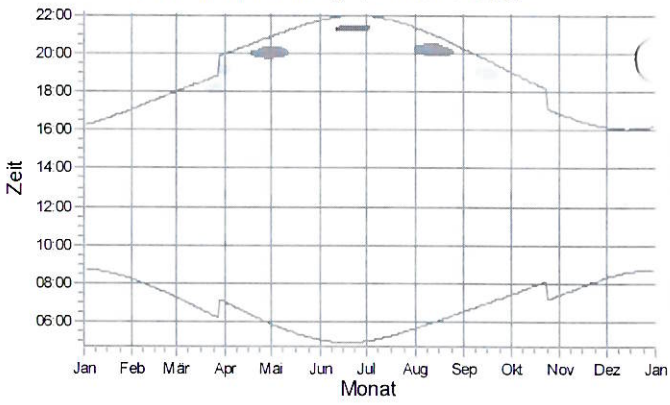
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuweg 5, 21769 Lamstedt



WEA

- WEA03: E-175 EP5
- WEA04: E-175 EP5
- WEA05: E-175 EP5
- WEA06: E-175 EP5
- WEA09: E-175 EP5
- WEA10: E-70 E4 (M2)
- WEA12: E-70 E4 (M5)
- WEA13: E-70 E4 (M6)

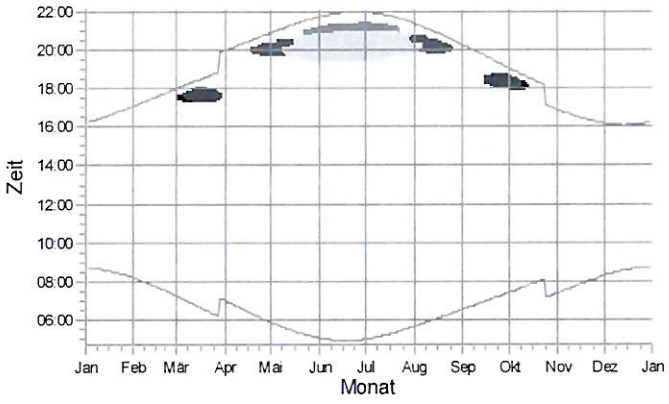
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

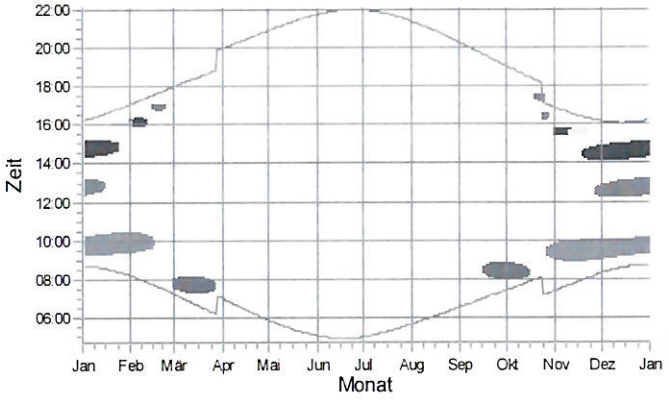
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

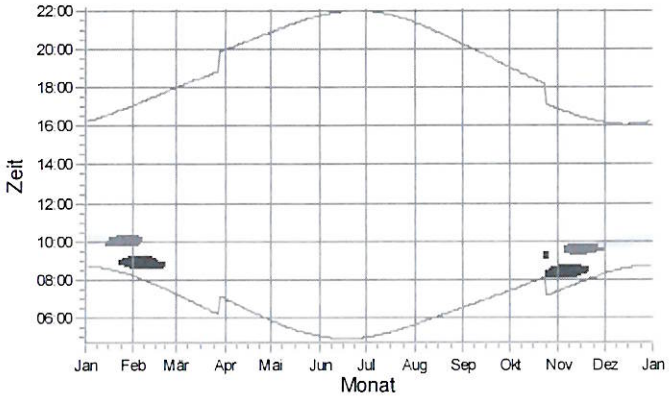
IP07: Driftweg 2, 21769 Lamstedt



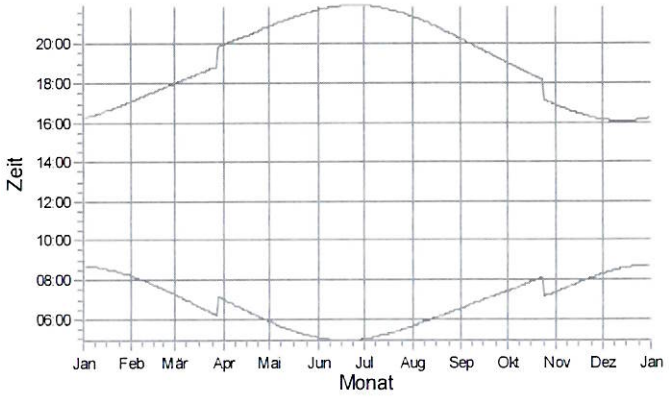
IP08: Haneworth 1, 21770 Lamstedt



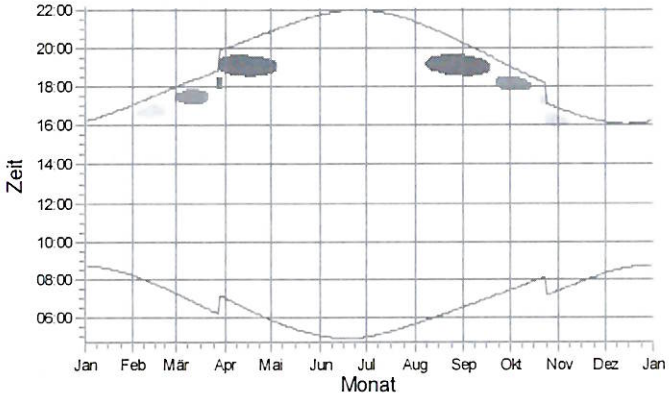
IP09: Sticht 5, 21770 Mittelstenahe



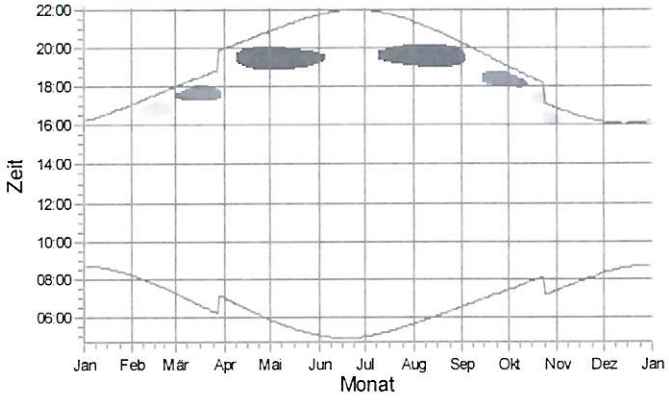
IP10: Falkenhorst 1, 21769 Lamstedt



IP11: Auf dem Kampen 2, 21769 Lamstedt



IP12: Auf dem Kampen 6, 21769 Lamstedt



WEA

- WEA02: E-175 EP5
- WEA03: E-175 EP5
- WEA04: E-175 EP5
- WEA05: E-175 EP5
- WEA06: E-175 EP5
- WEA07: E-175 EP5
- WEA08: E-175 EP5
- WEA09: E-175 EP5
- WEA10: E-70 E4 (M2)
- WEA11: E-70 E4 (M3)
- WEA13: E-70 E4 (M6)

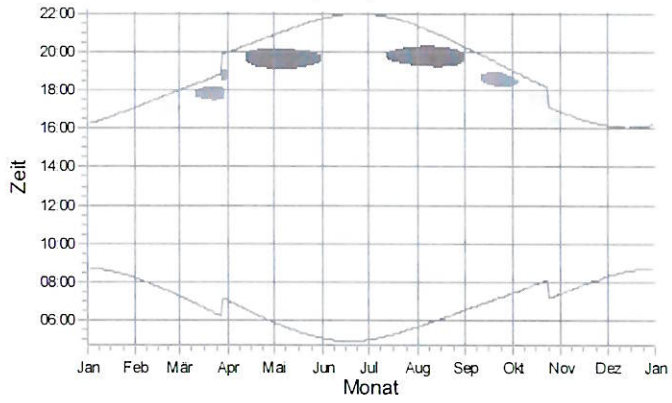
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

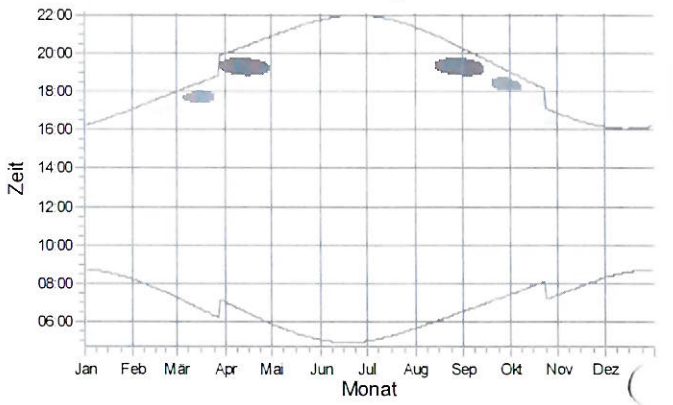
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

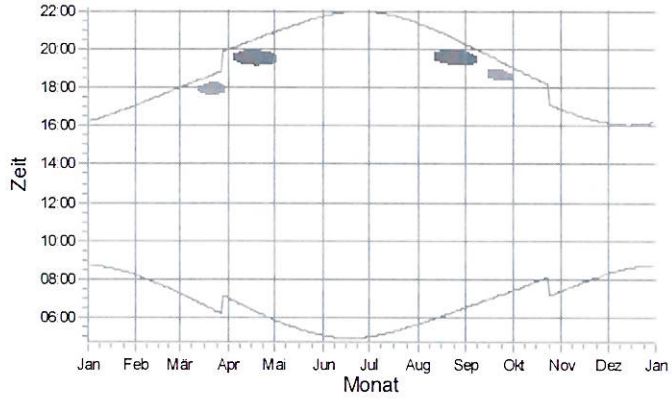
IP13: Auf dem Kampen 5, 21769 Lamstedt



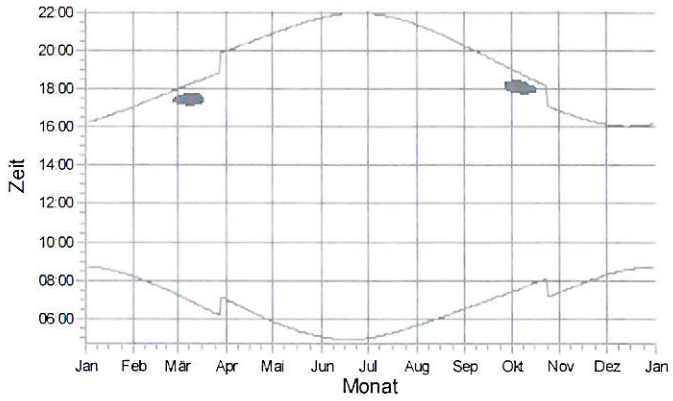
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



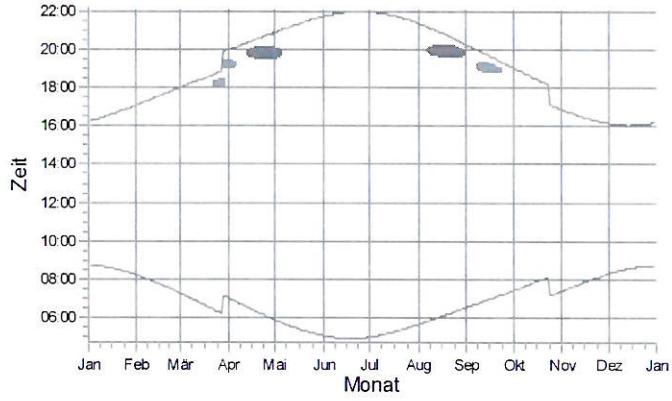
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



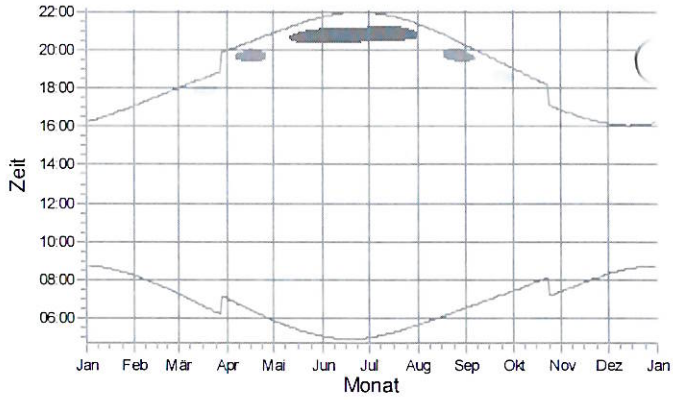
IP16: Kleiner Köven 15A, 21769 Lamstedt



IP17: An der Gösche 10, 21769 Lamstedt



IP18: Wischhofstraße 17a, 21769 Lamstedt



WEA

WEA05: E-175 EP5

WEA06: E-175 EP5

WEA09: E-175 EP5

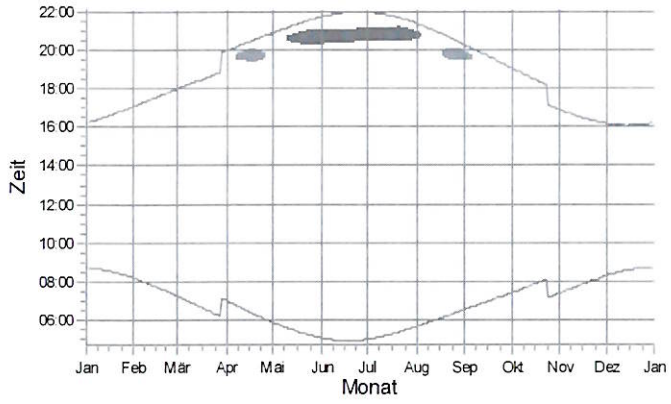
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

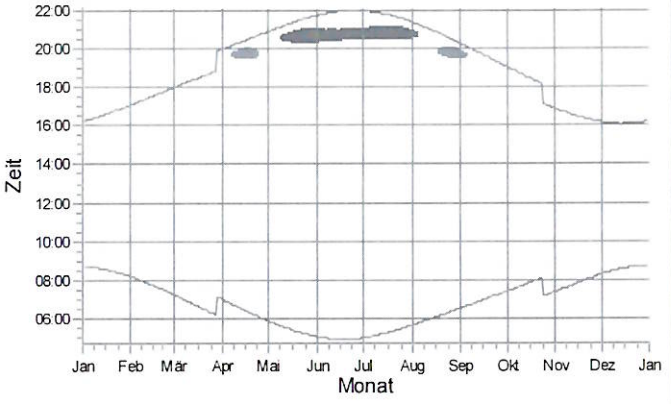
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

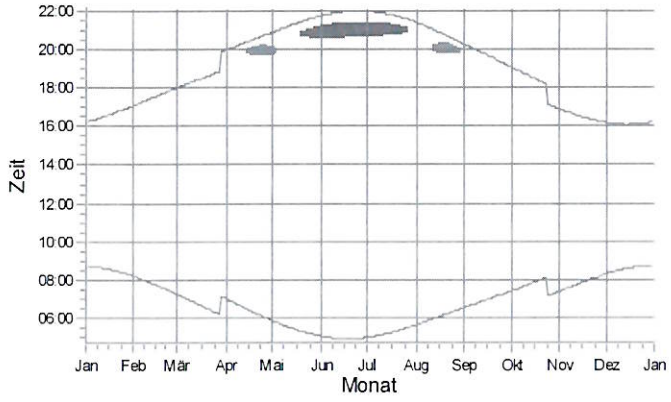
IP19: Wischhofstraße 15, 21769 Lamstedt



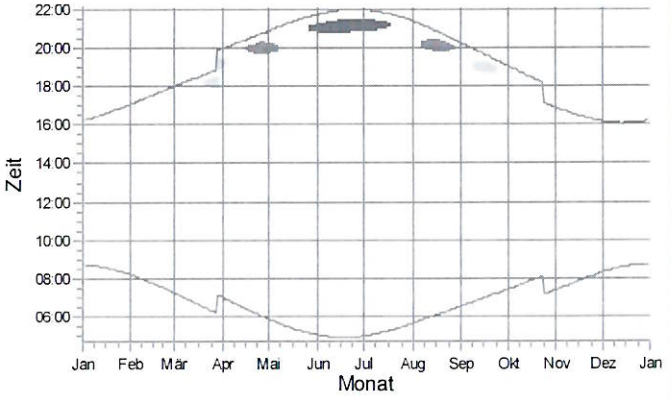
IP20: Wischhofstraße 13, 21769 Lamstedt



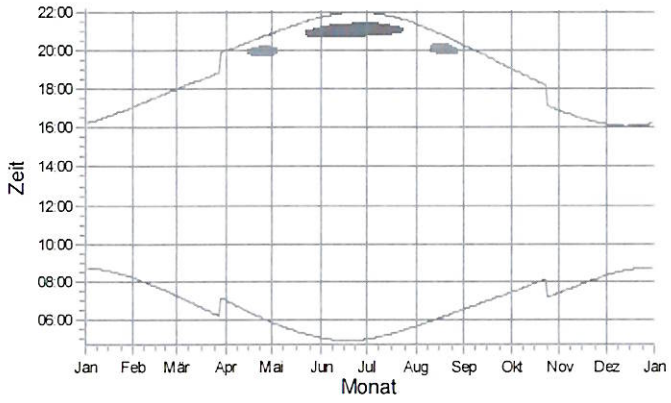
IP21: Auf der Stroth 18, 21769 Lamstedt



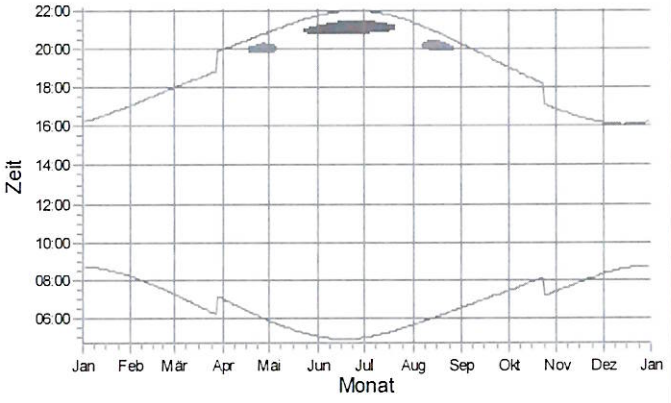
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt



WEA

WEA05: E-175 EP5

WEA06: E-175 EP5

WEA09: E-175 EP5

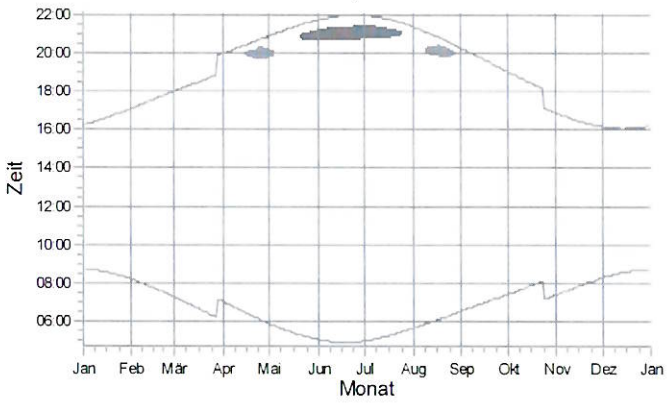
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

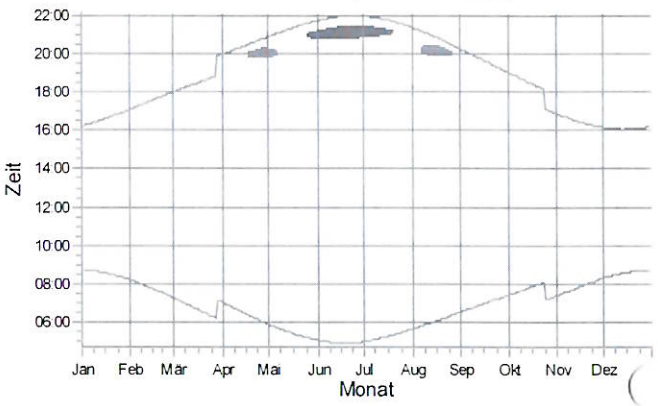
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

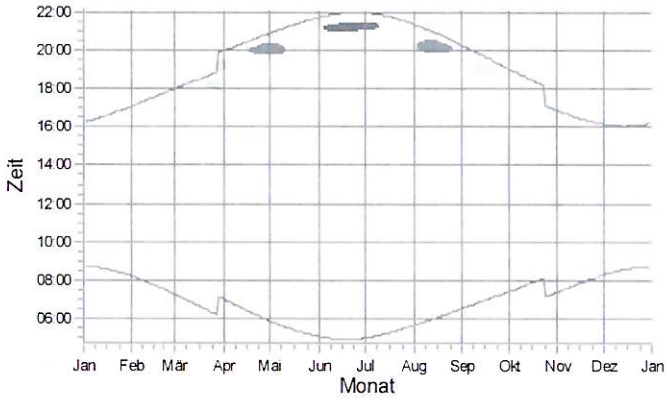
IP25: Auf der Stroth 21, 21769 Lamstedt



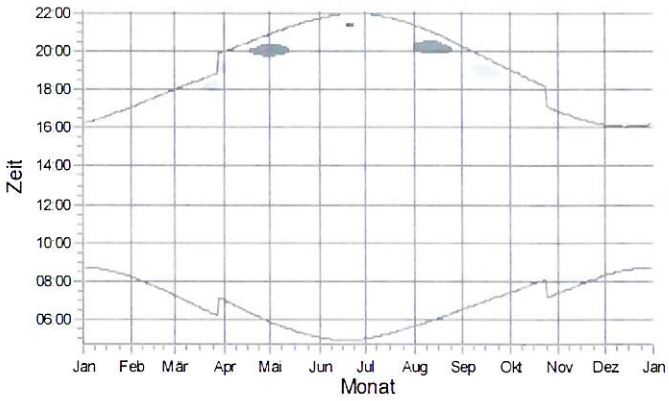
IP26: Auf der Stroth 25, 21769 Lamstedt



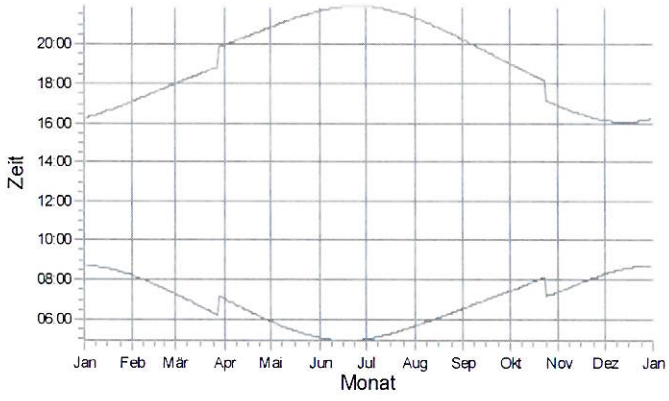
IP27: Strother Heuweg 1, 21769 Lamstedt



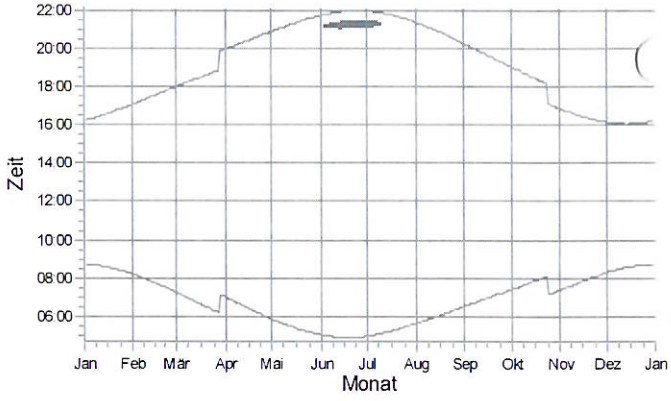
IP28: Strother Heuweg 9, 21769 Lamstedt



IP29: Birkenweg 11, 21769 Lamstedt



IP30: Pappelweg 7, 21769 Lamstedt



WEA

WEA05: E-175 EP5 WEA06: E-175 EP5 WEA09: E-175 EP5

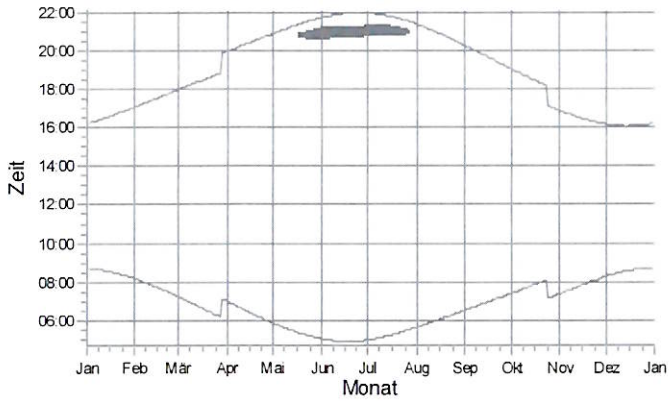
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

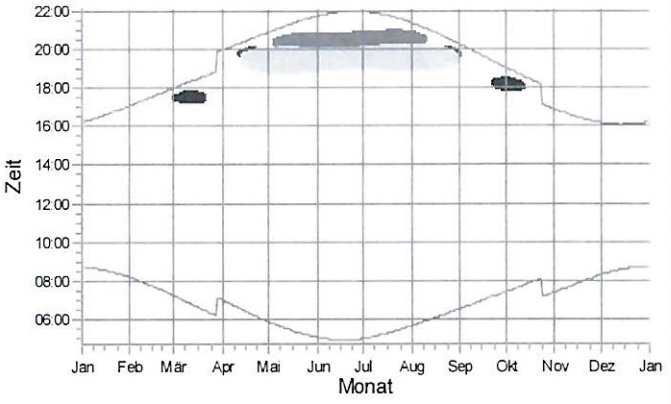
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

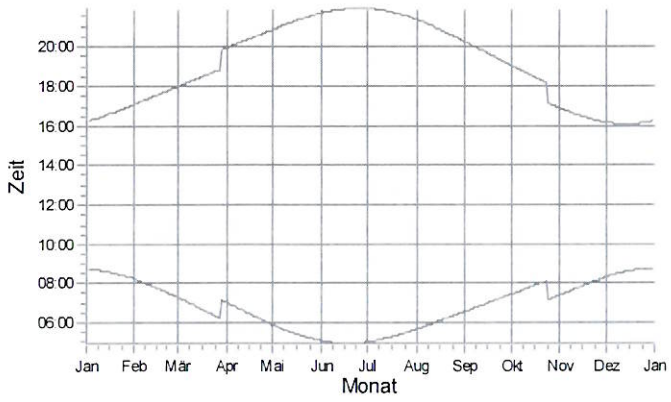
IP31: Jochensweg 8, 21769 Lamstedt



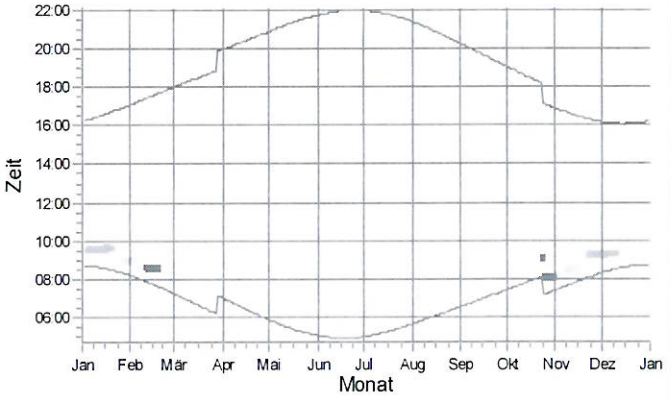
IP32: Driftweg 1, 21769 Lamstedt



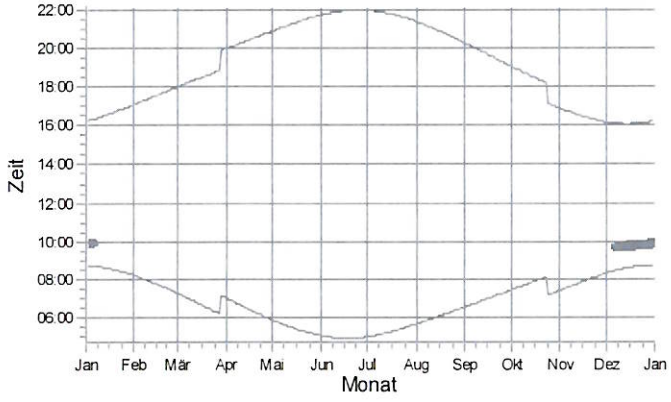
IP33: Horn 23, 21769 Armstorf



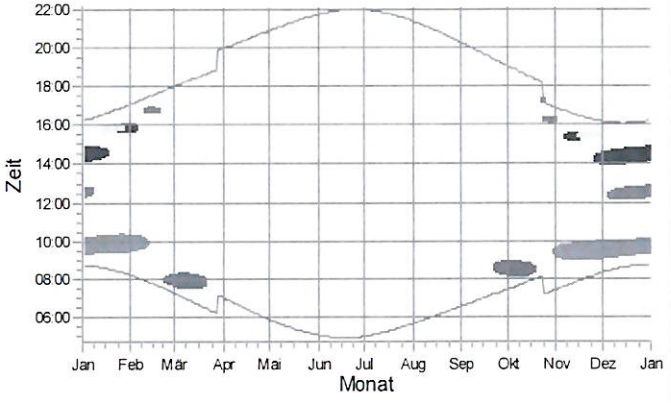
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Hanew orth 2, 21770 Lamstedt



WEA

- WEA02: E-175 EP5
- WEA03: E-175 EP5
- WEA04: E-175 EP5
- WEA05: E-175 EP5
- WEA06: E-175 EP5
- WEA08: E-175 EP5
- WEA09: E-175 EP5
- WEA10: E-70 E4 (M2)
- WEA11: E-70 E4 (M3)
- WEA12: E-70 E4 (M5)
- WEA13: E-70 E4 (M6)

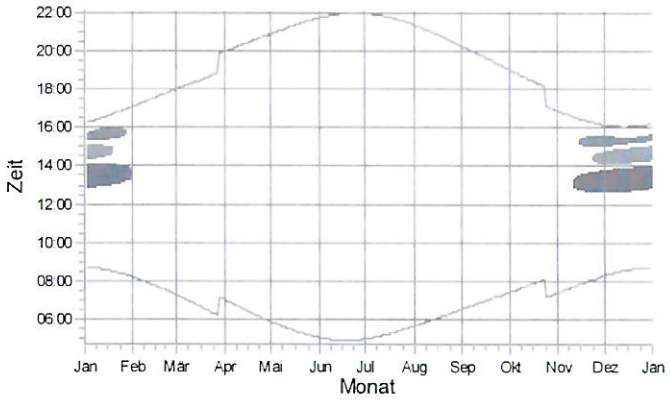
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

IP37: Mittelstenaher Str. 32, 21769 Lamstedt



WEA

WEA04: E-175 EP5

WEA05: E-175 EP5

WEA06: E-175 EP5

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA01 - E-138 EP3 E3

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:22	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:42	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:41
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	0	0	0	0	0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA02 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar	März		April		Mai	Juni
1	08:41	14:47-15:19/32	08:12	07:15		07:00	19:03-19:31/28	05:51	05:02
	16:14	09:50-10:16/26	17:05	18:00		19:58		20:53	21:43
2	08:41	14:48-15:19/31	08:10	07:12		06:57	19:05-19:33/28	05:49	05:01
	16:15	09:51-10:16/25	17:07	18:02		20:00		20:55	21:44
3	08:41	14:49-15:20/31	08:08	07:10		06:55	19:08-19:32/24	05:47	05:00
	16:16	09:52-10:17/25	17:09	18:04		20:02		20:57	21:45
4	08:41	14:50-15:20/30	08:06	07:08		06:53	19:09-19:32/23	05:45	05:00
	16:18	09:52-10:17/25	17:11	18:06		20:04		20:59	21:46
5	08:40	14:52-15:20/28	08:05	07:05		06:50	19:09-19:31/22	05:43	04:59
	16:19	09:53-10:17/24	17:13	18:08		20:06		21:00	21:47
6	08:40	14:53-15:20/27	08:03	07:03		06:48	19:09-19:30/21	05:41	04:58
	16:20	09:54-10:17/23	17:15	18:10		20:07		21:02	21:48
7	08:40	14:54-15:20/26	08:01	07:00		06:45	19:11-19:28/17	05:39	04:57
	16:21	09:54-10:16/22	17:17	18:12		20:09		21:04	21:49
8	08:39	14:57-15:20/23	07:59	06:58		06:43	19:13-19:26/13	05:37	04:57
	16:23	09:56-10:17/21	17:19	18:14		20:11		21:06	21:50
9	08:39	09:57-10:16/19	07:57	06:56		06:41	19:15-19:22/7	05:35	04:56
	16:24	15:00-15:20/20	17:21	18:16		20:13		21:07	21:51
10	08:38	09:58-10:15/17	07:55	06:53		06:38		05:34	04:56
	16:26	15:01-15:20/19	17:23	18:17		20:15		21:09	21:52
11	08:37	10:00-10:15/15	07:53	06:51		06:36		05:32	04:55
	16:27	15:02-15:19/17	17:25	18:19		20:17		21:11	21:53
12	08:37	10:01-10:13/12	07:51	06:49		06:34		05:30	04:55
	16:29	15:03-15:18/15	17:27	18:21		20:18		21:13	21:54
13	08:36	10:04-10:12/8	07:49	06:46		06:31		05:28	04:55
	16:30	15:05-15:17/12	17:29	18:23		20:20		21:14	21:54
14	08:35	15:07-15:16/9	07:47	06:44		06:29		05:27	04:54
	16:32		17:31	18:25		20:22		21:16	21:55
15	08:34		07:45	06:41		06:27		05:25	04:54
	16:34		17:33	18:27		20:24		21:18	21:56
16	08:33		07:43	06:39		06:24		05:23	04:54
	16:35		17:35	18:29		20:26		21:19	21:56
17	08:32		07:41	06:36		06:22		05:22	04:54
	16:37		17:37	18:31		20:28		21:21	21:57
18	08:31		07:39	06:34		06:20		05:20	04:54
	16:39		17:39	18:32		20:29		21:23	21:57
19	08:30		07:37	06:32		06:17		05:18	04:54
	16:40		17:41	18:34		20:31		21:24	21:57
20	08:29		07:35	06:29		06:15		05:17	04:54
	16:42		17:43	18:36		20:33		21:26	21:58
21	08:28		07:32	06:27	18:07-18:11/4	06:13		05:15	04:54
	16:44		17:45	18:38		20:35		21:27	21:58
22	08:26		07:30	06:24	18:05-18:14/9	06:11		05:14	04:54
	16:46		17:47	18:40		20:37		21:29	21:58
23	08:25		07:28	06:22	18:04-18:15/11	06:08		05:13	04:54
	16:48		17:49	18:42		20:39		21:30	21:58
24	08:24		07:26	06:19	18:03-18:17/14	06:06		05:11	04:55
	16:50		17:51	18:44		20:40		21:32	21:58
25	08:22		07:24	06:17	18:02-18:19/17	06:04		05:10	04:55
	16:51		17:53	18:45		20:42		21:33	21:58
26	08:21		07:21	06:15	18:02-18:21/19	06:02		05:09	04:55
	16:53		17:54	18:47		20:44		21:35	21:58
27	08:19		07:19	06:12	18:01-18:22/21	06:00		05:08	04:56
	16:55		17:56	18:49		20:46		21:36	21:58
28	08:18		07:17	06:10	18:01-18:24/23	05:57		05:06	04:56
	16:57		17:58	18:51		20:48		21:38	21:58
29	08:16			07:07	19:02-19:27/25	05:55		05:05	04:57
	16:59			19:53		20:50		21:39	21:58
30	08:15			07:05	19:01-19:28/27	05:53		05:04	04:58
	17:01			19:55		20:51		21:40	21:58
31	08:13			07:02	19:02-19:30/28			05:03	
	17:03			19:56				21:41	
Sonnenscheinstunden	251		274	367		420		493	509
Anzahl Minuten mit Schatten		582	0		198		183	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA02 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22	08:17 09:42-09:57/15
	21:57	21:23	20:16	19:03	16:53	16:09 14:44-15:01/17
2	04:59	05:39	06:33	07:26	07:24	08:18 09:41-09:58/17
	21:57	21:21	20:14	19:01	16:51	16:08 14:44-15:03/19
3	05:00	05:41	06:35 19:13-19:20/7	07:28	07:26	08:20 09:40-09:59/19
	21:57	21:19	20:12	18:58	16:49	16:08 14:43-15:03/20
4	05:01	05:43	06:37 19:10-19:23/13	07:30	07:28	08:21 14:42-15:04/22
	21:56	21:17	20:09	18:56	16:47	16:07 09:40-10:01/21
5	05:01	05:44	06:39 19:07-19:24/17	07:32	07:30	08:23 14:39-15:05/26
	21:56	21:15	20:07	18:54	16:45	16:06 09:40-10:02/22
6	05:02	05:46	06:40 19:06-19:26/20	07:33	07:32	08:24 14:39-15:06/27
	21:55	21:13	20:04	18:51	16:44	16:06 09:40-10:03/23
7	05:03	05:48	06:42 19:05-19:26/21	07:35	07:34	08:25 14:38-15:06/28
	21:54	21:11	20:02	18:49	16:42	16:05 09:39-10:03/24
8	05:04	05:50	06:44 19:03-19:26/23	07:37	07:36	08:27 14:38-15:08/30
	21:54	21:09	20:00	18:46	16:40	16:05 09:40-10:05/25
9	05:05	05:51	06:46 19:02-19:27/25	07:39	07:38	08:28 14:37-15:08/31
	21:53	21:07	19:57	18:44	16:38	16:05 09:40-10:05/25
10	05:06	05:53	06:47 18:58-19:27/29	07:41	07:39	08:29 14:37-15:09/32
	21:52	21:05	19:55	18:42	16:36	16:04 09:40-10:06/26
11	05:08	05:55	06:49 18:56-19:25/29	07:42	07:41	08:30 14:37-15:09/32
	21:51	21:03	19:52	18:39	16:35	16:04 09:41-10:07/26
12	05:09	05:56	06:51 18:54-19:22/28	07:44	07:43	08:31 14:38-15:10/32
	21:50	21:01	19:50	18:37	16:33	16:04 09:41-10:08/27
13	05:10	05:58	06:53 18:53-19:19/26	07:46	07:45	08:32 14:38-15:11/33
	21:49	20:59	19:47	18:35	16:31	16:04 09:41-10:08/27
14	05:11	06:00	06:54 18:52-19:17/25	07:48	07:47	08:33 14:38-15:11/33
	21:48	20:57	19:45	18:32	16:30	16:04 09:41-10:09/28
15	05:12	06:02	06:56 18:50-19:14/24	07:50	07:49	08:34 14:38-15:12/34
	21:47	20:55	19:43	18:30	16:28	16:04 09:42-10:09/27
16	05:14	06:03	06:58 18:50-19:12/22	07:52	07:51	08:35 14:39-15:13/34
	21:46	20:53	19:40	18:28	16:27	16:04 09:42-10:10/28
17	05:15	06:05	07:00 18:50-19:10/20	07:54	07:53	08:36 14:38-15:12/34
	21:45	20:51	19:38	18:25	16:25	16:04 09:42-10:10/28
18	05:16	06:07	07:01 18:50-19:08/18	07:55	07:54	08:37 14:39-15:13/34
	21:44	20:49	19:35	18:23	16:24	16:04 09:42-10:11/29
19	05:18	06:09	07:03 18:49-19:04/15	07:57	07:56	08:37 14:39-15:14/35
	21:43	20:46	19:33	18:21	16:22	16:05 09:43-10:11/28
20	05:19	06:10	07:05 18:50-19:02/12	07:59	07:58	08:38 14:39-15:14/35
	21:41	20:44	19:30	18:19	16:21	16:05 09:44-10:12/28
21	05:21	06:12	07:07 18:51-19:00/9	08:01	08:00	08:39 14:40-15:15/35
	21:40	20:42	19:28	18:16	16:20	16:05 09:44-10:12/28
22	05:22	06:14	07:08 18:51-18:57/6	08:03	08:02	08:39 14:40-15:15/35
	21:39	20:40	19:25	18:14	16:18	16:06 09:45-10:13/28
23	05:23	06:16	07:10 18:53-18:54/1	08:05	08:03	08:40 14:41-15:16/35
	21:37	20:37	19:23	18:12	16:17	16:06 09:45-10:13/28
24	05:25	06:17	07:12	08:07	08:05	08:40 14:41-15:16/35
	21:36	20:35	19:20	18:10	16:16	16:07 09:45-10:13/28
25	05:27	06:19	07:14	07:09	08:07	08:41 14:42-15:16/34
	21:34	20:33	19:18	17:08	16:15	16:08 09:46-10:14/28
26	05:28	06:21	07:15	07:11	08:09	08:41 14:43-15:17/34
	21:33	20:31	19:15	17:05	16:14	16:08 09:46-10:15/29
27	05:30	06:23	07:17	07:13	08:10	08:41 14:43-15:18/35
	21:31	20:28	19:13	17:03	16:13	16:09 09:47-10:15/28
28	05:31	06:24	07:19	07:14	08:12 14:47-14:56/9	08:41 14:44-15:18/34
	21:29	20:26	19:11	17:01	16:12	16:10 09:47-10:15/28
29	05:33	06:26	07:21	07:16	08:14 09:45-09:52/7	08:41 14:45-15:18/33
	21:28	20:24	19:08	16:59	16:11 14:46-14:58/12	16:11 09:48-10:16/28
30	05:34	06:28	07:23	07:18	08:15 09:44-09:55/11	08:41 14:45-15:19/34
	21:26	20:21	19:06	16:57	16:10 14:44-14:59/15	16:12 09:49-10:16/27
31	05:36	06:30		07:20		08:41 14:46-15:19/33
	21:24	20:19		16:55		16:13 09:49-10:16/27
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	390	0	54	1765

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA03 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 14:13-15:04/51 16:14	08:12 08:39-09:08/29 17:05	07:14 18:00	07:00 19:58	05:51 19:44-20:19/35 20:53	05:02 21:43
2	08:41 14:14-15:04/50 16:15	08:10 08:39-09:09/30 17:07	07:12 18:02	06:57 20:00	05:49 19:47-20:18/31 20:55	05:01 21:44
3	08:41 14:15-15:05/50 16:16	08:08 08:40-09:10/30 17:09	07:10 18:04	06:55 20:02	05:47 19:47-20:18/31 20:57	05:00 21:45
4	08:41 14:15-15:05/50 16:18	08:06 08:40-09:10/30 17:11	07:08 18:06	06:53 20:04	05:45 19:47-20:17/30 20:59	04:59 21:46
5	08:40 14:16-15:06/50 16:19	08:05 08:40-09:10/30 17:13	07:05 18:08	06:50 20:06	05:43 19:48-20:17/29 21:00	04:59 21:47
6	08:40 14:17-15:05/48 16:20	08:03 08:40-09:10/30 17:15	07:03 18:10	06:48 20:07	05:41 19:48-20:16/28 21:02	04:58 21:48
7	08:40 14:17-15:05/48 16:21	08:01 08:40-09:10/30 17:17	07:00 18:12	06:45 20:09	05:39 19:48-20:15/27 21:04	04:57 21:49
8	08:39 14:19-15:06/47 16:23	07:59 08:41-09:09/28 17:19	06:58 18:14	06:43 20:11	05:37 19:50-20:15/25 21:06	04:57 21:50
9	08:39 14:20-15:06/46 16:24	07:57 08:41-09:09/28 17:21	06:56 18:16	06:41 20:13	05:35 19:50-20:14/24 21:07	04:56 21:51
10	08:38 14:21-15:06/45 16:26	07:55 08:42-09:08/26 17:23	06:53 18:17	06:38 20:15	05:34 19:51-20:12/21 21:09	04:56 21:52
11	08:37 14:22-15:06/44 16:27	07:53 08:43-09:08/25 17:25	06:51 18:19	06:36 19:45-19:50/5 20:17	05:32 19:53-20:11/18 21:11	04:55 21:53
12	08:37 14:23-15:06/43 16:29	07:51 08:44-09:06/22 17:27	06:49 18:21	06:34 19:41-19:51/10 20:18	05:30 19:55-20:09/14 21:13	04:55 21:54
13	08:36 14:25-15:06/41 16:30	07:49 08:45-09:04/19 17:29	06:46 18:23	06:31 19:40-19:53/13 20:20	05:28 19:57-20:06/9 21:14	04:54 21:54
14	08:35 14:27-15:06/39 16:32	07:47 08:47-09:02/15 17:31	06:44 18:25	06:29 19:39-19:55/16 20:22	05:26 21:16	04:54 21:55
15	08:34 14:29-15:06/37 16:34	07:45 08:51-08:59/8 17:33	06:41 18:27	06:26 19:37-19:56/19 20:24	05:25 21:18	04:54 21:56
16	08:33 14:33-15:05/32 16:35	07:43 17:35	06:39 18:29	06:24 19:36-19:58/22 20:26	05:23 21:19	04:54 21:56
17	08:32 14:37-15:05/28 16:37	07:41 17:37	06:36 18:31	06:22 19:35-20:00/25 20:28	05:22 21:21	04:54 21:57
18	08:31 14:37-15:04/27 16:39	07:39 17:39	06:34 18:32	06:20 19:35-20:02/27 20:29	05:20 21:23	04:54 21:57
19	08:30 14:39-15:03/24 16:40	07:37 17:41	06:32 18:34	06:17 19:34-20:03/29 20:31	05:18 21:24	04:54 21:57
20	08:29 14:41-15:03/22 16:42	07:35 17:43	06:29 18:36	06:15 19:34-20:04/30 20:33	05:17 21:26	04:54 21:58
21	08:28 14:43-15:01/18 16:44	07:32 17:45	06:27 18:38	06:13 19:34-20:06/32 20:35	05:15 21:27	04:54 21:58
22	08:26 14:46-14:59/13 16:46	07:30 17:47	06:24 18:40	06:11 19:34-20:08/34 20:37	05:14 21:29	04:54 21:58
23	08:25 08:54-08:58/4 16:48 14:50-14:54/4	07:28 17:49	06:22 18:42	06:08 19:34-20:10/36 20:39	05:13 21:30	04:54 21:58
24	08:24 08:53-09:00/7 16:50	07:26 17:51	06:19 18:44	06:06 19:34-20:12/38 20:40	05:11 21:32	04:55 21:58
25	08:22 08:51-09:02/11 16:51	07:24 17:52	06:17 18:45	06:04 19:35-20:14/39 20:42	05:10 21:33	04:55 21:58
26	08:21 08:50-09:04/14 16:53	07:21 17:54	06:15 18:47	06:02 19:35-20:15/40 20:44	05:09 21:35	04:55 21:58
27	08:19 08:48-09:05/17 16:55	07:19 17:56	06:12 18:49	06:00 19:36-20:17/41 20:46	05:07 21:36	04:56 21:58
28	08:18 08:46-09:05/19 16:57	07:17 17:58	06:10 18:51	05:57 19:37-20:19/42 20:48	05:06 21:38	04:56 21:58
29	08:16 08:45-09:07/22 16:59		07:07 19:53	05:55 19:39-20:19/40 20:50	05:05 21:39	04:57 21:58
30	08:15 08:43-09:07/24 17:01		07:05 19:55	05:53 19:41-20:19/38 20:51	05:04 21:40	04:58 21:58
31	08:13 08:41-09:08/27 17:03		07:02 19:56		05:03 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	1002	380	0	576	322	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA03 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 21:57	05:38 20:04-20:20/16 21:23	06:31 19:44-19:48/4 20:16	07:24 19:03	07:22 08:11-08:37/26 16:53	08:17 14:04-14:48/44 16:09
2	04:59 21:57	05:39 20:03-20:22/19 21:21	06:33 20:14	07:26 19:01	07:24 08:11-08:39/28 16:51	08:18 14:04-14:49/45 16:08
3	05:00 21:57	05:41 20:01-20:23/22 21:19	06:35 20:12	07:28 18:58	07:26 08:10-08:39/29 16:49	08:20 14:03-14:49/46 16:08
4	05:01 21:56	05:43 20:00-20:24/24 21:17	06:37 20:09	07:30 18:56	07:28 08:10-08:39/29 16:47	08:21 14:03-14:50/47 16:07
5	05:01 21:56	05:44 19:59-20:24/25 21:15	06:39 20:07	07:32 18:53	07:30 08:10-08:40/30 16:45	08:23 14:02-14:50/48 16:06
6	05:02 21:55	05:46 19:58-20:26/28 21:13	06:40 20:04	07:33 18:51	07:32 08:10-08:40/30 16:43	08:24 14:03-14:52/49 16:06
7	05:03 21:54	05:48 19:57-20:25/28 21:11	06:42 20:02	07:35 18:49	07:34 08:10-08:40/30 16:42	08:25 14:02-14:52/50 16:05
8	05:04 21:54	05:50 19:57-20:26/29 21:09	06:44 20:00	07:37 18:46	07:36 08:10-08:40/30 16:40	08:27 14:03-14:53/50 16:05
9	05:05 21:53	05:51 19:57-20:27/30 21:07	06:46 19:57	07:39 18:44	07:38 08:10-08:39/29 16:38	08:28 14:03-14:53/50 16:05
10	05:06 21:52	05:53 19:56-20:27/31 21:05	06:47 19:55	07:41 18:42	07:39 08:10-08:39/29 16:36	08:29 14:03-14:53/50 16:04
11	05:07 21:51	05:55 19:56-20:27/31 21:03	06:49 19:52	07:42 18:39	07:41 08:12-08:39/27 16:35	08:30 14:03-14:54/51 16:04
12	05:09 21:50	05:56 19:51-20:27/36 21:01	06:51 19:50	07:44 18:37	07:43 08:15-08:39/24 16:33	08:31 14:04-14:55/51 16:04
13	05:10 21:49	05:58 19:48-20:27/39 20:59	06:53 19:47	07:46 18:35	07:45 08:17-08:39/22 16:31	08:32 14:04-14:56/52 16:04
14	05:11 21:48	06:00 19:46-20:27/41 20:57	06:54 19:45	07:48 18:32	07:47 08:19-08:38/19 16:30	08:33 14:04-14:56/52 16:04
15	05:12 21:47	06:02 19:44-20:25/41 20:55	06:56 19:42	07:50 18:30	07:49 08:21-08:37/16 16:28	08:34 14:05-14:57/52 16:04
16	05:14 21:46	06:03 19:43-20:23/40 20:53	06:58 19:40	07:52 18:28	07:51 08:23-08:37/14 16:27	08:35 14:05-14:57/52 16:04
17	05:15 21:45	06:05 19:42-20:22/40 20:51	07:00 19:38	07:54 18:25	07:53 08:25-08:36/11 16:25	08:36 14:05-14:57/52 16:04 10:33-10:36/3
18	05:16 21:44	06:07 19:40-20:19/39 20:49	07:01 19:35	07:55 18:23	07:54 08:27-08:34/7 16:24	08:37 14:05-14:58/53 16:04 10:33-10:38/5
19	05:18 21:43	06:09 19:40-20:17/37 20:46	07:03 19:33	07:57 18:21	07:56 08:29-08:33/4 16:22 14:25-14:29/4	08:37 14:06-14:58/52 16:05 10:33-10:40/7
20	05:19 21:41	06:10 19:40-20:15/35 20:44	07:05 19:30	07:59 18:19	07:58 14:21-14:34/13 16:21	08:38 14:06-14:58/52 16:05 10:33-10:41/8
21	05:21 21:40	06:12 19:38-20:13/35 20:42	07:07 19:28	08:01 18:16	08:00 14:19-14:37/18 16:20	08:39 14:07-14:59/52 16:05 10:33-10:41/8
22	05:22 21:39	06:14 19:38-20:11/33 20:40	07:08 19:25	08:03 18:14	08:02 14:17-14:39/22 16:18	08:39 14:07-14:59/52 16:06 10:34-10:42/8
23	05:23 21:37	06:16 19:38-20:09/31 20:37	07:10 19:23	08:05 18:12	08:03 14:16-14:40/24 16:17	08:40 14:08-15:00/52 16:06 10:34-10:42/8
24	05:25 21:36	06:17 19:37-20:06/29 20:35	07:12 19:20	08:07 18:10	08:05 14:15-14:42/27 16:16	08:40 14:08-15:00/52 16:07 10:34-10:42/8
25	05:26 21:34	06:19 19:38-20:04/26 20:33	07:14 19:18	07:09 17:08	08:07 14:14-14:42/28 16:15	08:41 14:08-15:00/52 16:08 10:36-10:42/6
26	05:28 21:33	06:21 19:38-20:02/24 20:31	07:15 19:15	07:11 17:05	08:09 14:11-14:43/32 16:14	08:41 14:09-15:02/53 16:08 10:37-10:42/5
27	05:30 21:31	06:23 19:38-19:59/21 20:28	07:17 19:13	07:12 08:19-08:30/11 17:03	08:10 14:08-14:45/37 16:13	08:41 14:10-15:02/52 16:09
28	05:31 21:29	06:24 19:39-19:57/18 20:26	07:19 19:11	07:14 08:16-08:32/16 17:01	08:12 14:07-14:46/39 16:12	08:41 14:10-15:02/52 16:10
29	05:33 21:28	06:26 19:40-19:55/15 20:24	07:21 19:08	07:16 08:14-08:34/20 16:59	08:14 14:06-14:47/41 16:11	08:41 14:11-15:03/52 16:11
30	05:34 20:11-20:14/3 21:26	06:28 19:40-19:52/12 20:21	07:23 19:06	07:18 08:13-08:35/22 16:57	08:15 14:04-14:47/43 16:10	08:41 14:12-15:03/51 16:12
31	05:36 20:06-20:18/12 21:24	06:30 19:41-19:50/9 20:19		07:20 08:12-08:36/24 16:55		08:41 14:13-15:04/51 16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	15	884	4	93	762	1635

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA04 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 15:24-15:36/12 09:44-10:01/17	08:12	07:14	07:00	05:51	05:02 20:02-21:08/66
	16:14 12:22-13:08/46 09:15-09:30/15	17:05	18:00	19:58	20:53	21:43
2	08:41 15:24-15:38/14 09:45-10:01/16	08:10	07:12 17:31-17:34/3	06:57	05:49	05:01 20:03-21:10/67
	16:15 12:23-13:08/45 09:15-09:31/16	17:07	18:02	20:00	20:55	21:44
3	08:41 15:25-15:39/14 09:47-10:02/15	08:08	07:10 17:30-17:37/7	06:55	05:47	05:00 20:03-21:10/67
	16:16 12:25-13:08/43 09:15-09:33/18	17:09	18:04	20:02	20:57	21:45
4	08:41 15:24-15:40/16 09:47-10:01/14	08:06	07:08 17:29-17:39/10	06:53	05:45 20:18-20:28/10	04:59 20:03-21:11/68
	16:17 12:26-13:08/42 09:14-09:33/19	17:11	18:06	20:04	20:59	21:46
5	08:40 15:25-15:42/17 09:49-10:01/12	08:05	07:05 17:27-17:41/14	06:50	05:43 20:14-20:30/16	04:59 20:04-21:13/69
	16:19 12:28-13:08/40 09:14-09:34/20	17:13	18:08	20:06	21:00	21:47
6	08:40 15:25-15:43/18 09:50-10:00/10	08:03	07:03 17:27-17:43/16	06:48	05:41 20:12-20:31/19	04:58 20:04-21:13/69
	16:20 12:30-13:07/37 09:13-09:34/21	17:15	18:10	20:07	21:02	21:48
7	08:40 15:25-15:44/19 09:52-09:58/6	08:01	07:00 17:26-17:44/18	06:45	05:39 20:10-20:33/23	04:57 20:05-21:14/69
	16:21 12:33-13:07/34 09:12-09:35/23	17:17	18:12	20:09	21:04	21:49
8	08:39 15:26-15:47/21 09:12-09:36/24	07:59	06:58 17:26-17:47/21	06:43	05:37 20:09-20:35/26	04:57 20:05-21:14/69
	16:23 12:36-13:07/31	17:19	18:14	20:11	21:06	21:50
9	08:39 15:26-15:48/22 09:11-09:36/25	07:57	06:56 17:26-17:49/23	06:41	05:35 20:07-20:36/29	04:56 20:05-21:15/70
	16:24 12:37-13:06/29	17:21	18:16	20:13	21:07	21:51
10	08:38 15:26-15:49/23 09:10-09:37/27	07:55	06:53 17:26-17:49/23	06:38	05:34 20:06-20:38/32	04:56 20:05-21:14/69
	16:26 12:39-13:05/26	17:23	18:17	20:15	21:09	21:52
11	08:37 15:26-15:51/25 09:09-09:37/28	07:53	06:51 17:27-17:49/22	06:36	05:32 20:06-20:40/34	04:55 20:06-21:15/69
	16:27 12:40-13:04/24	17:25	18:19	20:17	21:11	21:53
12	08:37 15:27-15:53/26 09:08-09:38/30	07:51	06:49 17:27-17:47/20	06:33	05:30 20:04-20:41/37	04:55 20:06-21:16/70
	16:29 12:42-13:03/21	17:27	18:21 17:52-17:54/2	20:18	21:13	21:54
13	08:36 15:27-15:54/27 09:09-09:38/29	07:49	06:46 17:28-17:46/18	06:31	05:28 20:03-20:42/39	04:54 20:06-21:15/69
	16:30 12:45-13:01/16	17:29	18:23 17:49-17:57/8	20:20	21:14	21:54
14	08:35 15:28-15:55/27 09:09-09:39/30	07:47	06:44 17:29-17:43/14	06:29	05:26 20:03-20:43/40	04:54 20:07-21:16/69
	16:32 12:49-12:58/9	17:31	18:25 17:47-17:58/11	20:22	21:16	21:55
15	08:34 15:28-15:55/27	07:45	06:41 17:33-17:40/7	06:26	05:25 20:02-20:43/41	04:54 20:07-21:16/69
	16:34 09:09-09:39/30	17:33	18:27 17:46-18:00/14	20:24	21:18	21:55
16	08:33 15:29-15:56/27	07:43	06:39 17:44-18:02/18	06:24	05:23 20:02-20:44/42	04:54 20:07-21:17/70
	16:35 09:10-09:40/30	17:35	18:29	20:26	21:19	21:56
17	08:32 15:30-15:56/26	07:41	06:36 17:44-18:04/20	06:22	05:21 20:02-20:44/42	04:54 20:08-21:17/69
	16:37 09:10-09:40/30	17:37	18:31	20:28	21:21	21:57
18	08:31 15:30-15:55/25	07:39	06:34 17:43-18:06/23	06:20	05:20 20:02-20:45/43	04:54 20:08-21:17/69
	16:39 09:10-09:40/30	17:39	18:32	20:29	21:23	21:57
19	08:30 15:31-15:56/25	07:37	06:32 17:42-18:08/26	06:17	05:18 20:02-20:45/43	04:54 20:08-21:17/69
	16:40 09:11-09:40/29	17:41	18:34	20:31	21:24	21:57
20	08:29 15:32-15:56/24	07:35	06:29 17:42-18:10/28	06:15	05:17 20:01-20:45/44	04:54 20:08-21:18/70
	16:42 09:12-09:41/29	17:43	18:36	20:33	21:26	21:58
21	08:28 15:32-15:55/23	07:32	06:27 17:42-18:10/28	06:13	05:15 20:01-20:45/44	04:54 20:08-21:19/71
	16:44 09:12-09:40/28	17:45	18:38	20:35	21:27	21:58
22	08:26 15:33-15:56/23	07:30	06:24 17:42-18:10/28	06:10	05:14 20:01-20:46/45	04:54 20:09-21:19/70
	16:46 09:13-09:41/28	17:47	18:40	20:37	21:29 20:49-20:54/5	21:58
23	08:25 15:34-15:55/21	07:28	06:22 17:42-18:08/26	06:08	05:13 20:01-20:57/56	04:54 20:09-21:19/70
	16:48 09:13-09:40/27	17:49	18:42	20:39	21:30	21:58
24	08:24 15:36-15:54/18	07:26	06:19 17:43-18:08/25	06:06	05:11 20:01-20:58/57	04:55 20:09-21:18/69
	16:50 09:14-09:40/26	17:50	18:44	20:40	21:32	21:58
25	08:22 15:37-15:53/16	07:24	06:17 17:43-18:06/23	06:04	05:10 20:01-21:00/59	04:55 20:10-21:19/69
	16:51 09:15-09:40/25	17:52	18:45	20:42	21:33	21:58
26	08:21 15:39-15:52/13	07:21	06:14 17:44-18:05/21	06:02	05:09 20:01-21:01/60	04:55 20:09-21:19/70
	16:53 09:16-09:40/24	17:54	18:47	20:44	21:35	21:58
27	08:19 15:41-15:50/9	07:19	06:12 17:45-18:02/17	06:00	05:07 20:01-21:02/61	04:56 20:10-21:20/70
	16:55 09:17-09:39/22	17:56	18:49	20:46	21:36	21:58
28	08:18 09:18-09:37/19	07:17	06:10 17:48-18:00/12	05:57	05:06 20:02-21:04/62	04:56 20:10-21:19/69
	16:57	17:58	18:51	20:48	21:38	21:58
29	08:16 09:21-09:37/16		07:07	05:55	05:05 20:02-21:05/63	04:57 20:10-21:20/70
	16:59		19:53	20:49	21:39	21:58
30	08:15 09:23-09:34/11		07:05	05:53	05:04 20:02-21:06/64	04:58 20:10-21:19/69
	17:01		19:55	20:51	21:40	21:58
31	08:13 09:28-09:29/1		07:02		05:03 20:02-21:07/65	
	17:03		19:56		21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	1821	0	546	0	1201	2073

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA04 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 20:10-21:19/69 21:57	05:38 20:15-20:51/36 21:23	06:31 20:16	07:24 18:06-18:25/19 19:03 18:29-18:34/5	07:22 16:53	08:17 15:09-15:33/24 08:51-09:19/28 16:09 12:22-12:46/24
2	04:59 20:11-21:20/69 21:57	05:39 20:16-20:50/34 21:21	06:33 20:14	07:26 18:05-18:26/21 19:01	07:24 16:51	08:18 15:09-15:33/24 08:53-09:20/27 16:08 12:22-12:48/26
3	05:00 20:10-21:19/69 21:57	05:41 20:17-20:48/31 21:19	06:35 20:12	07:28 18:04-18:27/23 18:58	07:26 16:49	08:20 15:09-15:31/22 08:54-09:19/25 16:08 12:20-12:49/29
4	05:00 20:10-21:19/69 21:56	05:43 20:18-20:46/28 21:17	06:37 20:09	07:30 18:04-18:27/23 18:56	07:28 16:47	08:21 15:10-15:31/21 08:56-09:20/24 16:07 12:20-12:51/31
5	05:01 20:10-21:19/69 21:56	05:44 20:19-20:44/25 21:15	06:38 20:07	07:31 18:03-18:25/22 18:53	07:30 16:45	08:23 15:10-15:30/20 09:38-09:44/6 16:06 12:18-12:52/34 08:58-09:21/23
6	05:02 20:10-21:19/69 21:55	05:46 20:21-20:43/22 21:13	06:40 20:04	07:33 18:03-18:23/20 18:51	07:32 16:43	08:24 15:11-15:29/18 09:36-09:46/10 16:06 12:16-12:53/37 08:59-09:20/21
7	05:03 20:11-21:19/68 21:54	05:48 20:22-20:40/18 21:11	06:42 20:02	07:35 18:03-18:20/17 18:49	07:34 16:42	08:25 15:11-15:28/17 09:35-09:47/12 16:05 12:15-12:54/39 09:00-09:20/20
8	05:04 20:11-21:19/68 21:54	05:49 20:24-20:39/15 21:09	06:44 20:00	07:37 18:02-18:17/15 18:46	07:36 16:40	08:26 15:13-15:28/15 09:35-09:49/14 16:05 12:14-12:56/42 09:02-09:21/19
9	05:05 20:11-21:18/67 21:53	05:51 20:29-20:37/8 21:07	06:45 19:57	07:39 18:03-18:15/12 18:44	07:37 16:38	08:28 15:13-15:28/15 09:35-09:50/15 16:05 12:13-12:56/43 09:03-09:21/18
10	05:06 20:11-21:18/67 21:52	05:53 21:05	06:47 19:55	07:41 18:03-18:12/9 18:42	07:39 16:36	08:29 15:13-15:27/14 09:34-09:50/16 16:04 12:12-12:57/45 09:04-09:21/17
11	05:07 20:11-21:17/66 21:51	05:55 21:03	06:49 19:52	07:42 18:04-18:10/6 18:39	07:41 08:58-09:01/3 16:35	08:30 15:14-15:26/12 09:35-09:52/17 16:04 12:12-12:58/46 09:06-09:22/16
12	05:09 20:11-21:16/65 21:50	05:56 21:01	06:51 19:50	07:44 18:06-18:08/2 18:37	07:43 08:54-09:06/12 16:33	08:31 15:15-15:27/12 09:35-09:53/18 16:04 12:13-12:59/46 09:07-09:22/15
13	05:10 20:10-21:15/65 21:49	05:58 20:59	06:52 19:47	07:46 18:34	07:45 08:52-09:09/17 16:31	08:32 15:16-15:27/11 09:35-09:53/18 16:04 12:12-13:00/48 09:08-09:22/14
14	05:11 20:10-21:14/64 21:48	06:00 20:57	06:54 19:45	07:48 18:32	07:47 08:51-09:10/19 16:30	08:33 15:16-15:27/11 09:35-09:54/19 16:04 12:12-13:01/49 09:09-09:22/13
15	05:12 20:10-21:13/63 21:47	06:02 20:55	06:56 18:38-18:49/11 19:42	07:50 18:30	07:49 15:14-15:23/9 16:28 08:50-09:12/22	08:34 15:17-15:27/10 09:36-09:55/19 16:04 12:12-13:01/49 09:10-09:22/12
16	05:14 20:11-21:13/62 21:46	06:03 20:53	06:58 18:35-18:51/16 19:40	07:52 18:28	07:51 15:12-15:25/13 16:27 08:49-09:13/24	08:35 15:18-15:27/9 09:36-09:56/20 16:04 12:13-13:02/49 09:11-09:23/12
17	05:15 20:11-21:11/60 21:45	06:05 20:51	07:00 18:33-18:53/20 19:38	07:54 18:25	07:53 15:10-15:27/17 16:25 08:49-09:14/25	08:36 15:17-15:26/9 09:35-09:55/20 16:04 12:12-13:02/50 09:11-09:22/11
18	05:16 20:11-21:10/59 21:44	06:07 20:49	07:01 18:30-18:53/23 19:35	07:55 18:23	07:54 15:09-15:28/19 16:24 08:48-09:14/26	08:37 15:18-15:26/8 09:36-09:56/20 16:04 12:13-13:03/50 09:12-09:23/11
19	05:18 20:10-21:09/59 21:43	06:09 20:46	07:03 18:29-18:54/25 19:33	07:57 18:21	07:56 15:09-15:30/21 16:22 08:48-09:15/27	08:37 15:19-15:27/8 09:37-09:57/20 16:05 12:13-13:04/51 09:13-09:23/10
20	05:19 20:11-21:08/57 21:41	06:10 20:44	07:05 18:28-18:55/27 19:30	07:59 18:18	07:58 15:08-15:31/23 16:21 08:48-09:16/28	08:38 15:19-15:27/8 09:37-09:58/21 16:05 12:13-13:04/51 09:14-09:24/10
21	05:20 20:11-21:07/56 21:40	06:12 20:42	07:07 18:28-18:55/27 19:28	08:01 18:16	08:00 15:08-15:31/23 16:20 08:48-09:16/28	08:39 15:20-15:27/7 09:37-09:58/21 16:05 12:14-13:04/50 09:14-09:24/10
22	05:22 20:11-20:55/44 21:38	06:14 20:40	07:08 18:26-18:54/28 19:25	08:03 18:14	08:02 15:08-15:32/24 16:18 08:48-09:17/29	08:39 15:20-15:27/7 09:38-09:59/21 16:06 12:14-13:04/50 09:15-09:25/10
23	05:23 20:12-20:56/44 21:37	06:16 20:37	07:10 18:26-18:54/28 19:23	08:05 18:12	08:03 15:08-15:33/25 16:17 08:48-09:18/30	08:40 15:21-15:29/8 09:38-09:59/21 16:06 12:15-13:06/51 09:15-09:25/10
24	05:25 20:12-20:55/43 21:36	06:17 20:35	07:12 18:26-18:52/26 19:20	08:07 18:10	08:05 15:08-15:34/26 16:16 08:48-09:18/30	08:40 15:21-15:29/8 09:39-09:59/20 16:07 12:15-13:06/51 09:15-09:25/10
25	05:26 20:12-20:56/44 21:34	06:19 20:33	07:14 18:26-18:50/24 19:18	07:09 17:08	08:07 15:07-15:33/26 16:15 08:48-09:19/31	08:41 15:21-15:29/8 09:40-10:00/20 16:08 12:15-13:06/51 09:16-09:26/10
26	05:28 20:12-20:55/43 21:33	06:21 20:31	07:15 18:25-18:47/22 19:15	07:11 17:05	08:09 15:07-15:34/27 16:14 08:48-09:18/30	08:41 15:22-15:31/9 09:40-10:00/20 16:08 12:17-13:07/50 09:16-09:27/11
27	05:30 20:12-20:54/42 21:31	06:23 20:28	07:17 18:26-18:44/18 19:13	07:12 17:03	08:10 15:07-15:34/27 16:13 08:48-09:18/30	08:41 15:22-15:31/9 09:41-10:00/19 16:09 12:17-13:07/50 09:16-09:27/11
28	05:31 20:13-20:54/41 21:29	06:24 20:26	07:19 18:16-18:19/3 19:10 18:26-18:42/16	07:14 17:01	08:12 15:08-15:35/27 08:49-09:19/30 16:12 12:29-12:38/9	08:41 15:23-15:32/9 09:41-10:01/20 16:10 12:18-13:07/49 09:16-09:28/12
29	05:33 20:13-20:53/40 21:28	06:26 20:24	07:21 18:11-18:23/12 19:08 18:27-18:40/13	07:16 16:59	08:14 15:08-15:36/28 08:50-09:19/29 16:11 12:26-12:42/16	08:41 15:23-15:33/10 09:42-10:01/19 16:11 12:19-13:08/49 09:16-09:29/13
30	05:34 20:14-20:53/39 21:26	06:28 20:21	07:22 18:09-18:25/16 19:06 18:28-18:37/9	07:18 16:57	08:15 15:08-15:34/26 08:50-09:20/30 16:10 12:23-12:44/21	08:41 15:23-15:34/11 09:43-10:01/18 16:12 12:20-13:08/48 09:16-09:29/13
31	05:36 20:14-20:52/38 21:24	06:30 20:19		07:20 16:55		08:41 15:24-15:36/12 09:44-10:02/18 16:13 12:21-13:08/47 09:16-09:30/14
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	1778	217	364	194	907	2723

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA05 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar			Februar			März			April			Mai			Juni		
1	08:41	14:22-14:58/36		08:11	09:28-10:21/53		07:14	17:25-17:33/8		07:00	18:53-19:31/38		05:51	19:50-20:19/29		05:02		
	16:14	09:23-10:06/43		17:05			18:00			19:58			20:53			21:43		
2	08:41	14:23-14:59/36		08:10	09:28-10:20/52		07:12	17:22-17:34/12		06:57	18:52-19:33/41		05:49	19:50-20:19/29		05:01		
	16:15	09:23-10:07/44		17:07			18:02			20:00			20:55			21:44		
3	08:41	14:24-15:00/36		08:08	09:29-10:20/51		07:10	17:20-17:37/17		06:55	18:51-19:35/44		05:47	19:50-20:18/28		05:00		
	16:16	09:24-10:08/44		17:09			18:04			20:02			20:57			21:45		
4	08:41	14:24-14:59/35		08:06	09:31-10:20/49		07:07	17:19-17:39/20		06:53	18:50-19:34/44		05:45	19:51-20:17/26		04:59		
	16:17	09:23-10:08/45		17:11			18:06			20:04			20:58			21:46		
5	08:40	14:25-15:00/35		08:05	09:31-10:19/48		07:05	17:17-17:41/24		06:50	18:50-19:34/44		05:43	19:51-20:16/25		04:59		
	16:19	09:24-10:10/46		17:13			18:08			20:06			21:00			21:47		
6	08:40	14:25-15:00/35		08:03	09:32-10:19/47		07:03	17:17-17:43/26		06:48	18:48-19:34/46		05:41	19:52-20:15/23		04:58		
	16:20	09:23-10:10/47		17:15			18:10			20:07			21:02			21:48		
7	08:40	14:26-15:00/34		08:01	09:33-10:18/45		07:00	17:15-17:44/29		06:45	19:39-19:42/3		05:39	19:52-20:14/22		04:57		
	16:21	09:23-10:10/47		17:17	08:28-08:29/1		18:12			20:09	18:48-19:34/46		21:04			21:49		
8	08:39	14:27-15:00/33		07:59	09:34-10:17/43		06:58	17:15-17:47/32		06:43	19:36-19:43/7		05:37	19:54-20:14/20		04:57		
	16:23	09:24-10:12/48		17:19	08:26-08:31/5		18:14			20:11	18:48-19:34/46		21:06			21:50		
9	08:39	14:28-15:00/32		07:57	09:35-10:16/41		06:56	17:15-17:49/34		06:41	19:35-19:45/10		05:35	19:55-20:12/17		04:56		
	16:24	09:24-10:12/48		17:21	08:24-08:32/8		18:15			20:13	18:47-19:33/46		21:07			21:51		
10	08:38	14:28-15:00/32		07:55	09:37-10:15/38		06:53	17:14-17:51/37		06:38	18:47-19:48/61		05:33	19:57-20:10/13		04:56		
	16:26	09:24-10:13/49		17:23	08:22-08:33/11		18:17			20:15			21:09			21:52		
11	08:37	14:29-15:00/31		07:53	09:37-10:12/35		06:51	17:14-17:53/39		06:36	18:47-19:49/62		05:32	20:00-20:08/8		04:55		
	16:27	09:24-10:13/49		17:25	08:20-08:34/14		18:19			20:17			21:11			21:53		
12	08:37	14:30-15:00/30		07:51	09:39-10:10/31		06:48	17:14-17:54/40		06:33	18:47-19:51/64		05:30			04:55		
	16:29	09:24-10:14/50		17:27	08:17-08:34/17		18:21			20:18			21:13			21:54		
13	08:36	14:31-14:59/28		07:49	09:42-10:08/26		06:46	17:14-17:57/43		06:31	18:47-19:53/66		05:28			04:54		
	16:30	09:24-10:15/51		17:29	08:15-08:34/19		18:23			20:20			21:14			21:54		
14	08:35	14:32-14:59/27		07:47	09:45-10:05/20		06:44	17:14-17:58/44		06:29	18:47-19:55/68		05:26			04:54		
	16:32	09:24-10:15/51		17:31	08:13-08:35/22		18:25			20:22			21:16			21:55		
15	08:34	14:34-14:58/24		07:45	09:49-10:00/11		06:41	17:15-18:00/45		06:26	18:47-19:56/69		05:25			04:54		
	16:34	09:24-10:16/52		17:33	08:11-08:35/24		18:27			20:24			21:18			21:55		
16	08:33	14:36-14:58/22		07:43	08:11-08:35/24		06:39	17:15-18:02/47		06:24	18:48-19:58/70		05:23			04:54		
	16:35	09:24-10:17/53		17:35			18:29			20:26			21:19			21:56		
17	08:32	14:37-14:57/20		07:41	08:12-08:34/22		06:36	17:16-18:04/48		06:22	19:30-20:00/30		05:21			04:54		
	16:37	09:25-10:18/53		17:37			18:31			20:28	18:48-19:29/41		21:21			21:57		
18	08:31	14:39-14:55/16		07:39	08:12-08:33/21		06:34	17:17-18:05/48		06:19	19:30-20:02/32		05:20			04:54		
	16:39	09:24-10:18/54		17:39			18:32			20:29	18:49-19:28/39		21:23			21:57		
19	08:30	09:24-10:18/54		07:37	08:13-08:32/19		06:32	17:19-18:08/49		06:17	19:30-20:03/33		05:18			04:54		
	16:40	14:42-14:53/11		17:41			18:34			20:31	18:49-19:26/37		21:24			21:57		
20	08:29	09:25-10:19/54		07:35	08:14-08:31/17		06:29	17:22-18:10/48		06:15	19:30-20:04/34		05:17			04:54		
	16:42			17:43			18:36			20:33	18:51-19:25/34		21:26			21:58		
21	08:27	09:25-10:19/54		07:32	08:16-08:30/14		06:27	17:23-18:11/48		06:13	19:31-20:06/35		05:15			04:54		
	16:44			17:45			18:38			20:35	18:52-19:23/31		21:27			21:58		
22	08:26	09:25-10:20/55		07:30	08:18-08:26/8		06:24	17:23-18:14/51		06:10	19:32-20:08/36		05:14			04:54		
	16:46			17:47			18:40			20:37	18:54-19:22/28		21:29			21:58		
23	08:25	09:25-10:20/55		07:28			06:22	17:23-18:15/52		06:08	19:34-20:10/36		05:13			04:54		
	16:48			17:49			18:42			20:39	18:56-19:20/24		21:30			21:58		
24	08:24	09:26-10:21/55		07:26			06:19	17:25-18:17/52		06:06	19:36-20:12/36		05:11			04:55		
	16:49			17:50			18:43			20:40	18:58-19:17/19		21:32			21:58		
25	08:22	09:25-10:21/56		07:24			06:17	17:25-18:19/54		06:04	19:47-20:14/27		05:10			04:55		
	16:51			17:52			18:45			20:42	19:02-19:13/11		21:33			21:58		
26	08:21	09:26-10:21/55		07:21			06:14	17:27-18:21/54		06:02	19:46-20:15/29		05:09			04:55		
	16:53			17:54			18:47			20:44			21:35			21:58		
27	08:19	09:26-10:21/55		07:19			06:12	17:28-18:22/54		05:59	19:47-20:16/29		05:07			04:56		
	16:55			17:56			18:49			20:46			21:36			21:58		
28	08:18	09:26-10:21/55		07:17	17:28-17:31/3		06:10	17:32-18:24/52		05:57	19:48-20:18/30		05:06			04:56		
	16:57			17:58			18:51			20:48			21:37			21:58		
29	08:16	09:27-10:22/55					07:07	18:38-19:27/49		05:55	19:48-20:19/31		05:05			04:57		
	16:59						19:53			20:49			21:39			21:58		
30	08:15	09:28-10:21/53					07:05	18:39-19:28/49		05:53	19:49-20:18/29		05:04			04:57		
	17:01						19:55			20:51			21:40			21:58		
31	08:13	09:28-10:21/53					07:02	18:42-19:30/48					05:03					
	17:03						19:56						21:41					
Sonnenscheinstunden	251			274			367			420			493			509		
Anzahl Minuten mit Schatten		2136			839			1253			1586			240			0	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA05 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 21:57	05:38 21:23	06:31 18:46-19:48/62 20:16	07:24 17:53-18:34/41 19:03	07:22 09:05-09:43/38 16:53 07:51-08:02/11	08:17 14:11-14:42/31 16:09 09:06-09:56/50
2	04:59 21:57	05:39 20:08-20:18/10 21:21	06:33 18:45-19:45/60 20:14	07:26 17:52-18:32/40 19:01	07:24 09:04-09:45/41 16:51 07:54-08:02/8	08:18 14:12-14:43/31 16:08 09:07-09:56/49
3	05:00 21:57	05:41 20:06-20:21/15 21:19	06:35 19:33-19:43/10 20:12 18:45-19:31/46	07:28 17:52-18:30/38 18:58	07:26 09:04-09:47/43 16:49 07:56-08:01/5	08:20 14:11-14:43/32 16:08 09:07-09:55/48
4	05:00 21:56	05:43 20:05-20:23/18 21:17	06:37 19:34-19:41/7 20:09 18:45-19:31/46	07:30 17:52-18:27/35 18:56	07:28 09:03-09:48/45 16:47 07:58-07:59/1	08:21 14:11-14:44/33 16:07 09:08-09:56/48
5	05:01 21:56	05:44 20:03-20:24/21 21:15	06:38 19:35-19:38/3 20:07 18:44-19:30/46	07:31 17:52-18:25/33 18:53	07:30 09:02-09:49/47 16:45	08:22 14:11-14:45/34 16:06 09:08-09:55/47
6	05:02 21:55	05:46 20:02-20:25/23 21:13	06:40 18:44-19:30/46 20:04	07:33 17:52-18:23/31 18:51	07:32 09:01-09:49/48 16:43	08:24 14:11-14:46/35 16:06 09:09-09:56/47
7	05:03 21:54	05:48 20:01-20:25/24 21:11	06:42 18:45-19:29/44 20:02	07:35 17:52-18:20/28 18:49	07:34 09:00-09:50/50 16:42	08:25 14:11-14:46/35 16:05 09:10-09:56/46
8	05:04 21:54	05:49 20:00-20:26/26 21:09	06:44 18:44-19:28/44 20:00	07:37 17:52-18:17/25 18:46	07:36 09:00-09:51/51 16:40	08:26 14:12-14:47/35 16:05 09:11-09:56/45
9	05:05 21:53	05:51 20:00-20:27/27 21:07	06:45 18:45-19:29/44 19:57	07:39 17:53-18:15/22 18:44	07:37 08:59-09:51/52 16:38	08:28 14:12-14:48/36 16:05 09:12-09:56/44
10	05:06 21:52	05:53 19:59-20:27/28 21:05	06:47 18:45-19:27/42 19:55	07:41 17:54-18:12/18 18:41	07:39 08:59-09:51/52 16:36	08:29 14:12-14:48/36 16:04 09:12-09:56/44
11	05:07 21:51	05:55 19:59-20:27/28 21:03	06:49 18:46-19:25/39 19:52	07:42 17:55-18:10/15 18:39	07:41 08:59-09:52/53 16:35	08:30 14:12-14:49/37 16:04 09:13-09:56/43
12	05:09 21:50	05:56 19:58-20:27/29 21:01	06:51 18:46-19:22/36 19:50 18:34-18:45/11	07:44 17:57-18:08/11 18:37	07:43 08:58-09:52/54 16:33	08:31 14:13-14:50/37 16:04 09:14-09:57/43
13	05:10 21:49	05:58 19:57-20:27/30 20:59	06:52 18:31-19:19/48 19:47	07:46 17:59-18:05/6 18:34	07:45 08:59-09:54/55 16:31	08:32 14:13-14:50/37 16:04 09:15-09:57/42
14	05:11 21:48	06:00 19:57-20:27/30 20:57	06:54 18:28-19:17/49 19:45	07:48 18:32	07:47 08:59-09:54/55 16:30	08:33 14:14-14:51/37 16:04 09:15-09:58/43
15	05:12 21:47	06:02 19:55-20:25/30 20:55	06:56 18:22-19:14/52 19:42	07:50 18:30	07:49 08:59-09:54/55 16:28	08:34 14:14-14:52/38 16:04 09:16-09:58/42
16	05:14 21:46	06:03 19:54-20:23/29 20:53	06:58 18:18-19:12/54 19:40	07:52 18:27	07:51 08:59-09:54/55 16:27	08:35 14:14-14:52/38 16:04 09:17-09:58/41
17	05:15 21:45	06:05 19:54-20:22/28 20:51	06:59 18:16-19:10/54 19:38	07:53 18:25	07:53 08:59-09:54/55 16:25	08:36 14:14-14:52/38 16:04 09:17-09:58/41
18	05:16 21:44	06:07 19:52-20:19/27 19:07-19:20/13 20:49 19:47-19:48/1	07:01 18:13-19:07/54 19:35	07:55 18:23	07:54 09:00-09:55/55 16:24	08:37 14:15-14:53/38 16:04 09:17-09:58/41
19	05:18 21:42	06:09 19:41-20:17/36 20:46 19:03-19:23/20	07:03 18:11-19:04/53 19:33	07:57 18:21	07:56 09:00-09:55/55 16:22	08:37 14:15-14:53/38 16:05 09:18-09:59/41
20	05:19 21:41	06:10 19:39-20:15/36 20:44 19:01-19:26/25	07:05 18:10-19:02/52 19:30	07:59 08:48-08:59/11 18:18	07:58 09:00-09:55/55 16:21	08:38 14:15-14:53/38 16:05 09:18-09:59/41
21	05:20 21:40	06:12 19:37-20:13/36 20:42 18:58-19:27/29	07:06 18:09-19:00/51 19:28	08:01 08:46-09:01/15 18:16	08:00 09:01-09:55/54 16:20	08:39 14:16-14:54/38 16:05 09:19-10:00/41
22	05:22 21:38	06:14 19:36-20:11/35 20:40 18:56-19:28/32	07:08 18:56-18:57/1 19:25 18:07-18:55/48	08:03 08:44-09:02/18 18:14	08:02 09:01-09:55/54 16:18	08:39 14:16-14:54/38 16:06 09:19-10:00/41
23	05:23 21:37	06:16 19:35-20:09/34 20:37 18:55-19:30/35	07:10 18:07-18:54/47 19:23	08:05 08:43-09:03/20 18:12	08:03 09:02-09:56/54 16:17 14:19-14:30/11	08:40 14:17-14:55/38 16:06 09:20-10:01/41
24	05:25 21:36	06:17 19:33-20:06/33 20:35 18:53-19:30/37	07:12 18:03-18:52/49 19:20	08:07 08:42-09:04/22 18:10	08:05 14:17-14:33/16 16:16 09:02-09:56/54	08:40 14:17-14:55/38 16:07 09:20-10:01/41
25	05:26 21:34	06:19 19:33-20:04/31 20:33 18:52-19:31/39	07:14 18:01-18:50/49 19:18	07:09 07:41-08:04/23 17:07	08:07 14:15-14:34/19 16:15 09:02-09:55/53	08:41 14:18-14:55/37 16:08 09:20-10:01/41
26	05:28 21:33	06:21 18:51-20:02/71 20:30	07:15 17:58-18:47/49 19:15	07:11 07:41-08:04/23 17:05	08:09 14:14-14:36/22 16:14 09:02-09:55/53	08:41 14:19-14:57/38 16:08 09:22-10:03/41
27	05:30 21:31	06:23 18:49-19:59/70 20:28	07:17 17:57-18:44/47 19:13	07:12 09:17-09:31/14 17:03 07:41-08:04/23	08:10 14:13-14:37/24 16:13 09:03-09:55/52	08:41 14:19-14:57/38 16:09 09:22-10:03/41
28	05:31 21:29	06:24 18:49-19:57/68 20:26	07:19 17:56-18:42/46 19:10	07:14 09:13-09:35/22 17:01 07:43-08:04/21	08:12 14:13-14:39/26 16:12 09:04-09:56/52	08:41 14:20-14:57/37 16:10 09:22-10:04/42
29	05:33 21:28	06:26 18:48-19:55/67 20:24	07:21 17:55-18:40/45 19:08	07:16 09:11-09:38/27 16:59 07:45-08:04/19	08:13 14:12-14:40/28 16:11 09:05-09:56/51	08:41 14:20-14:58/38 16:11 09:22-10:04/42
30	05:34 21:26	06:28 18:47-19:52/65 20:21	07:22 17:54-18:37/43 19:06	07:18 09:08-09:40/32 16:57 07:47-08:03/16	08:15 14:11-14:41/30 16:10 09:05-09:55/50	08:41 14:21-14:58/37 16:12 09:23-10:05/42
31	05:36 21:24	06:30 18:46-19:50/64 20:19		07:20 09:07-09:42/35 16:55 07:49-08:03/14		08:41 14:22-14:59/37 16:13 09:23-10:06/43
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	1300	1477	698	1742	2470

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA06 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März		April		Mai		Juni	
1	08:41	12:46-13:57/71	08:11	13:18-13:44/26	07:14	07:39-08:12/33	07:00	18:49-19:31/42	05:51	18:51-20:17/86	05:02	20:25-21:08/43
	16:14		17:05		18:00	17:20-17:33/13	19:58		20:53		21:43	19:21-19:38/17
2	08:41	12:47-13:58/71	08:10	13:21-13:40/19	07:12	07:37-08:13/36	06:57	18:48-19:33/45	05:49	18:53-20:18/85	05:01	20:26-21:10/44
	16:15		17:07		18:02	17:18-17:34/16	20:00		20:55		21:44	19:24-19:37/13
3	08:41	12:48-13:59/71	08:08		07:10	07:34-08:13/39	06:55	18:46-19:35/49	05:47	18:56-20:17/81	05:00	20:26-21:11/45
	16:16		17:09		18:04	17:17-17:37/20	20:02		20:57		21:45	19:28-19:33/5
4	08:41	12:48-13:58/70	08:06		07:07	07:32-08:14/42	06:53	18:45-19:37/52	05:45	18:58-20:16/78	04:59	20:26-21:11/45
	16:17		17:11		18:06	17:17-17:39/22	20:04		20:58		21:46	
5	08:40	12:49-13:59/70	08:05		07:05	07:29-08:13/44	06:50	18:44-19:39/55	05:43	18:58-20:15/77	04:59	20:27-21:13/46
	16:19		17:13		18:08	17:16-17:41/25	20:06		21:00		21:47	
6	08:40	12:49-13:59/70	08:03		07:03	07:28-08:14/46	06:48	18:43-19:40/57	05:41	18:58-20:14/76	04:58	20:27-21:13/46
	16:20		17:15		18:10	17:16-17:43/27	20:07		21:02		21:48	
7	08:40	12:49-13:59/70	08:01		07:00	07:27-08:14/47	06:45	18:42-19:42/60	05:39	18:58-20:13/75	04:57	20:26-21:14/48
	16:21		17:17		18:12	17:15-17:44/29	20:09		21:04		21:49	
8	08:39	12:51-14:00/69	07:59		06:58	07:26-08:14/48	06:43	18:42-19:43/61	05:37	18:59-20:13/74	04:57	20:27-21:15/48
	16:23		17:19		18:14	17:15-17:44/29	20:11		21:06		21:50	
9	08:39	12:51-14:00/69	07:57		06:56	07:25-08:14/49	06:41	18:40-19:45/65	05:35	20:34-20:37/3	04:56	20:28-21:16/48
	16:24		17:21		18:15	17:15-17:44/29	20:13		21:07	18:59-20:11/72	21:51	
10	08:38	12:51-14:00/69	07:55		06:53	07:24-08:13/49	06:38	18:40-19:48/68	05:33	20:31-20:38/7	04:56	20:28-21:16/48
	16:26		17:23		18:17	17:15-17:43/28	20:15		21:09	18:59-20:09/70	21:52	
11	08:37	12:52-14:00/68	07:53		06:51	07:24-08:13/49	06:36	18:39-19:49/70	05:32	20:30-20:40/10	04:55	20:28-21:17/49
	16:27		17:25		18:19	17:16-17:42/26	20:17		21:11	19:00-20:07/67	21:53	
12	08:36	12:52-14:00/68	07:51		06:48	07:23-08:11/48	06:33	18:39-19:51/72	05:30	20:29-20:41/12	04:55	20:29-21:18/49
	16:29		17:27		18:21	17:16-17:41/25	20:18		21:13	19:00-20:03/63	21:54	
13	08:36	12:53-14:00/67	07:49		06:46	07:23-08:11/48	06:31	18:39-19:53/74	05:28	20:27-20:42/15	04:54	20:28-21:18/50
	16:30		17:29		18:23	17:18-17:40/22	20:20		21:14	19:00-20:02/62	21:54	
14	08:35	12:54-14:00/66	07:47		06:44	07:22-08:09/47	06:29	18:39-19:55/76	05:26	20:27-20:44/17	04:54	20:29-21:19/50
	16:32		17:31		18:25	17:18-17:37/19	20:22		21:16	19:01-20:02/61	21:55	
15	08:34	12:55-14:00/65	07:45		06:41	07:23-08:08/45	06:26	18:38-19:56/78	05:25	20:26-20:46/20	04:54	20:29-21:20/51
	16:33		17:33		18:27	17:21-17:35/14	20:24		21:18	19:01-20:01/60	21:55	
16	08:33	12:55-14:00/65	07:43		06:39	07:23-08:07/44	06:24	18:38-19:58/80	05:23	20:25-20:48/23	04:54	20:29-21:20/51
	16:35		17:35		18:29	17:24-17:30/6	20:26		21:19	19:03-20:01/58	21:56	
17	08:32	12:56-14:00/64	07:41		06:36	07:23-08:05/42	06:22	18:38-20:00/82	05:21	20:24-20:48/24	04:54	20:30-21:21/51
	16:37		17:37		18:30		20:28		21:21	19:03-20:00/57	21:56	
18	08:31	12:57-13:59/62	07:39		06:34	07:23-08:03/40	06:19	18:39-20:02/83	05:20	20:24-20:50/26	04:54	20:30-21:21/51
	16:39		17:39		18:32		20:29		21:23	19:04-20:00/56	21:57	
19	08:30	12:58-13:59/61	07:37		06:32	07:23-08:01/38	06:17	18:38-20:03/85	05:18	20:24-20:51/27	04:54	20:30-21:21/51
	16:40		17:41		18:34		20:31		21:24	19:04-19:58/54	21:57	
20	08:29	12:59-13:59/60	07:35		06:29	07:24-08:00/36	06:15	18:39-20:04/85	05:17	20:24-20:53/29	04:54	20:30-21:22/52
	16:42		17:43		18:36		20:33		21:26	19:05-19:58/53	21:58	
21	08:27	12:59-13:58/59	07:32		06:27	07:25-07:59/34	06:13	18:39-20:06/87	05:15	20:24-20:55/31	04:54	20:30-21:22/52
	16:44		17:45		18:38		20:35		21:27	19:07-19:57/50	21:58	
22	08:26	13:01-13:58/57	07:30		06:24	07:26-07:57/31	06:10	18:40-20:08/88	05:14	20:24-20:56/32	04:54	20:31-21:23/52
	16:46		17:47		18:40		20:37		21:29	19:08-19:57/49	21:58	
23	08:25	13:01-13:57/56	07:28	07:55-07:56/1	06:22	07:27-07:55/28	06:08	18:40-20:10/90	05:12	20:23-20:57/34	04:54	20:31-21:22/51
	16:48		17:48		18:42		20:39		21:30	19:08-19:55/47	21:58	
24	08:24	13:03-13:57/54	07:26	07:51-08:04/13	06:19	07:29-07:53/24	06:06	18:41-20:12/91	05:11	20:23-20:58/35	04:54	20:31-21:22/51
	16:49		17:50		18:43		20:40		21:32	19:09-19:54/45	21:58	
25	08:22	13:04-13:55/51	07:24	07:48-08:06/18	06:17	07:30-07:49/19	06:04	18:42-20:14/92	05:10	20:24-21:00/36	04:55	20:32-21:23/51
	16:51		17:52		18:45		20:42		21:33	19:11-19:53/42	21:58	
26	08:21	13:06-13:55/49	07:21	07:46-08:08/22	06:14	07:35-07:45/10	06:02	18:43-20:14/91	05:09	20:24-21:01/37	04:55	20:32-21:22/50
	16:53		17:54	17:26-17:27/1	18:47		20:44		21:35	19:12-19:52/40	21:58	
27	08:19	13:07-13:53/46	07:19	07:44-08:10/26	06:12	18:05-18:16/11	05:59	18:43-20:16/93	05:07	20:24-21:03/39	04:56	20:32-21:23/51
	16:55		17:56	17:23-17:29/6	18:49		20:46		21:36	19:13-19:51/38	21:58	
28	08:18	13:08-13:51/43	07:17	07:41-08:11/30	06:10	18:00-18:21/21	05:57	18:45-20:18/93	05:06	20:24-21:04/40	04:56	20:32-21:22/50
	16:57		17:58	17:21-17:31/10	18:51		20:48		21:37	19:15-19:49/34	21:58	
29	08:16	13:11-13:50/39			07:07	18:57-19:25/28	05:55	18:46-20:18/92	05:05	20:24-21:05/41	04:57	20:32-21:23/51
	16:59				19:53		20:49		21:39	19:16-19:47/31	21:58	
30	08:15	13:13-13:49/36			07:05	18:54-19:28/34	05:53	18:48-20:17/89	05:04	20:25-21:06/41	04:57	20:32-21:22/50
	17:01				19:54		20:51		21:40	19:18-19:45/27	21:58	
31	08:13	13:15-13:46/31			07:02	18:52-19:30/38			05:03	20:25-21:07/42		
	17:03				19:56				21:41	19:19-19:40/21		
Sonnenscheinstunden	251		274		367		420		493		509	
Anzahl Minuten mit Schatten		1867		172		1498		2245		2410		1510

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA06 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 20:32-21:22/50 21:57	05:38 20:39-20:51/12 21:22 19:10-20:14/64	06:31 18:39-19:48/69 20:16	07:24 08:03-08:51/48 19:03 17:55-18:19/24	07:22 16:53	08:17 12:34-13:42/68 16:09
2	04:59 20:33-21:22/49 21:57	05:39 20:40-20:49/9 21:21 19:09-20:18/69	06:33 18:38-19:45/67 20:14	07:26 08:02-08:50/48 19:01 17:54-18:20/26	07:24 16:51	08:18 12:34-13:43/69 16:08
3	05:00 20:32-21:21/49 21:57	05:41 20:43-20:48/5 21:19 19:09-20:20/71	06:35 18:38-19:43/65 20:12	07:28 08:02-08:50/48 18:58 17:53-18:21/28	07:26 16:49	08:20 12:34-13:43/69 16:08
4	05:00 20:33-21:21/48 21:56	05:43 19:09-20:22/73 21:17	06:37 18:39-19:41/62 20:09	07:30 08:02-08:51/49 18:56 17:53-18:21/28	07:28 16:47	08:21 12:35-13:44/69 16:07
5	05:01 20:33-21:20/47 21:56	05:44 19:08-20:23/75 21:15	06:38 18:38-19:38/60 20:07	07:31 08:02-08:51/49 18:53 17:52-18:21/29	07:30 16:45	08:22 12:34-13:44/70 16:06
6	05:02 20:33-21:20/47 21:55	05:46 19:08-20:24/76 21:13	06:40 18:39-19:36/57 20:04	07:33 08:03-08:50/47 18:51 17:52-18:21/29	07:32 16:43	08:24 12:35-13:45/70 16:06
7	05:03 20:33-21:19/46 21:54	05:48 19:07-20:24/77 21:11	06:42 18:39-19:34/55 20:02	07:35 08:04-08:50/46 18:49 17:51-18:19/28	07:34 16:42	08:25 12:35-13:45/70 16:05
8	05:04 20:33-21:19/46 21:54	05:49 19:07-20:25/78 21:09	06:44 18:39-19:31/52 20:00	07:37 08:03-08:49/46 18:46 17:51-18:17/26	07:36 12:59-13:05/6 16:40	08:26 12:36-13:47/71 16:05
9	05:05 20:33-21:18/45 21:53	05:51 19:07-20:26/79 21:07	06:45 18:40-19:29/49 19:57	07:39 08:05-08:48/43 18:44 17:51-18:15/24	07:37 12:52-13:11/19 16:38	08:28 12:36-13:47/71 16:05
10	05:06 20:33-21:18/45 21:52 19:33-19:43/10	05:53 19:04-20:26/82 21:05	06:47 18:41-19:27/46 19:55	07:41 08:07-08:48/41 18:41 17:51-18:12/21	07:39 12:48-13:15/27 16:36	08:29 12:36-13:47/71 16:04
11	05:07 20:33-21:17/44 21:51 19:30-19:45/15	05:55 19:01-20:26/85 21:03	06:49 18:42-19:24/42 19:52	07:42 08:09-08:47/38 18:39 17:51-18:10/19	07:41 12:45-13:17/32 16:35	08:30 12:36-13:47/71 16:04
12	05:09 20:33-21:16/43 21:50 19:29-19:47/18	05:56 18:57-20:26/89 21:01	06:51 18:43-19:22/39 19:50	07:44 08:11-08:46/35 18:37 17:52-18:08/16	07:43 12:43-13:20/37 16:33	08:31 12:38-13:49/71 16:04
13	05:10 20:33-21:15/42 21:49 19:27-19:51/24	05:58 18:56-20:26/90 20:59	06:52 18:45-19:19/34 19:47	07:46 08:13-08:45/32 18:34 17:53-18:05/12	07:45 12:43-13:22/39 16:31	08:32 12:38-13:49/71 16:04
14	05:11 20:33-21:14/41 21:48 19:25-19:55/30	06:00 18:54-20:26/92 20:57	06:54 18:47-19:15/28 19:45	07:48 08:15-08:43/28 18:32 17:55-18:03/8	07:47 12:41-13:24/43 16:30	08:33 12:38-13:50/72 16:04
15	05:12 20:33-21:13/40 21:47 19:24-19:57/33	06:02 18:52-20:25/93 20:55	06:56 18:49-19:11/22 19:42	07:50 08:17-08:42/25 18:30 17:56-18:01/5	07:49 12:40-13:26/46 16:28	08:34 12:39-13:50/71 16:04
16	05:13 20:33-21:12/39 21:46 19:22-19:59/37	06:03 18:51-20:23/92 20:53	06:58 18:53-19:07/14 19:40	07:52 08:19-08:40/21 18:27	07:51 12:39-13:28/49 16:27	08:35 12:39-13:51/72 16:04
17	05:15 20:33-21:11/38 21:45 19:22-20:01/39	06:05 18:50-20:22/92 20:51	06:59 08:25-08:32/7 19:37	07:53 08:21-08:37/16 18:25	07:53 12:38-13:29/51 16:25	08:36 12:39-13:50/71 16:04
18	05:16 20:33-21:10/37 21:44 19:21-20:02/41	06:07 18:48-20:19/91 20:49	07:01 08:20-08:37/17 19:35	07:55 08:23-08:33/10 18:23	07:54 12:37-13:31/54 16:24	08:37 12:40-13:51/71 16:04
19	05:18 20:33-21:09/36 21:42 19:20-20:03/43	06:09 18:47-20:17/90 20:46	07:03 08:16-08:39/23 19:33	07:57 18:21	07:56 12:36-13:32/56 16:22	08:37 12:40-13:52/72 16:04
20	05:19 20:34-21:08/34 21:41 19:19-20:05/46	06:10 18:46-20:15/89 20:44	07:05 08:14-08:41/27 19:30	07:59 18:18	07:58 12:36-13:33/57 16:21	08:38 12:40-13:52/72 16:05
21	05:20 20:34-21:07/33 21:40 19:18-20:06/48	06:12 18:44-20:13/89 20:42	07:06 08:12-08:42/30 19:28	08:01 18:16	08:00 12:35-13:34/59 16:20	08:39 12:41-13:53/72 16:05
22	05:22 20:33-21:05/32 21:38 19:17-20:07/50	06:14 18:44-20:11/87 20:40	07:08 08:10-08:44/34 19:25	08:03 18:14	08:02 12:35-13:35/60 16:18	08:39 12:41-13:53/72 16:06
23	05:23 20:34-21:04/30 21:37 19:17-20:08/51	06:16 18:43-20:09/86 20:37	07:10 08:08-08:44/36 19:23	08:05 18:12	08:03 12:35-13:36/61 16:17	08:40 12:42-13:54/72 16:06
24	05:25 20:34-21:03/29 21:36 19:15-20:09/54	06:17 18:42-20:06/84 20:35	07:12 08:07-08:45/38 19:20	08:07 18:10	08:05 12:35-13:37/62 16:16	08:40 12:42-13:54/72 16:07
25	05:26 20:34-21:02/28 21:34 19:15-20:10/55	06:19 18:41-20:04/83 20:33	07:14 08:06-08:45/39 19:18	07:09 17:07	08:07 12:34-13:37/63 16:15	08:40 12:43-13:54/71 16:07
26	05:28 20:35-21:00/25 21:33 19:14-20:10/56	06:21 18:41-20:02/81 20:30	07:15 08:06-08:47/41 19:15	07:10 17:05	08:09 12:34-13:38/64 16:14	08:41 12:44-13:55/71 16:08
27	05:29 20:35-20:58/23 21:31 19:13-20:11/58	06:23 18:40-19:59/79 20:28	07:17 08:04-08:48/44 19:13	07:12 17:03	08:10 12:34-13:39/65 16:13	08:41 12:44-13:56/72 16:09
28	05:31 20:36-20:57/21 21:29 19:13-20:12/59	06:24 18:40-19:57/77 20:26	07:19 08:04-08:49/45 19:10 18:03-18:15/12	07:14 17:01	08:12 12:34-13:40/66 16:12	08:41 12:45-13:56/71 16:10
29	05:33 20:36-20:55/19 21:28 19:12-20:12/60	06:26 18:40-19:55/75 20:23	07:21 08:03-08:50/47 19:08 18:00-18:17/17	07:16 16:59	08:13 12:34-13:41/67 16:11	08:41 12:45-13:56/71 16:11
30	05:34 20:37-20:54/17 21:26 19:11-20:13/62	06:28 18:39-19:52/73 20:21	07:22 08:03-08:50/47 19:06 17:58-18:19/21	07:18 16:57	08:15 12:34-13:41/67 16:10	08:41 12:46-13:57/71 16:12
31	05:36 20:38-20:52/14 21:24 19:10-20:13/63	06:30 18:39-19:50/71 20:19		07:20 16:55		08:41 12:46-13:57/71 16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	2089	2558	1286	993	1150	2198

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA07 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:14	07:00	05:51	05:02	04:58	05:38	06:32	07:24 18:05-18:26/21	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12 17:32-17:35/3	06:57	05:49	05:01	04:59	05:39	06:33	07:26 18:04-18:26/22	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10 17:30-17:37/7	06:55	05:47	05:00	05:00	05:41	06:35	07:28 18:03-18:27/24	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08 17:29-17:39/10	06:53	05:45	05:00	05:01	05:43	06:37	07:30 18:03-18:27/24	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05 17:27-17:41/14	06:50	05:43	04:59	05:01	05:44	06:39	07:32 18:03-18:25/22	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03 17:27-17:43/16	06:48	05:41	04:58	05:02	05:46	06:40	07:33 18:03-18:23/20	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:44	16:06
7	08:40	08:01	07:00 17:26-17:44/18	06:45	05:39	04:57	05:03	05:48	06:42	07:35 18:03-18:20/17	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58 17:26-17:47/21	06:43	05:37	04:57	05:04	05:50	06:44	07:37 18:02-18:17/15	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56 17:26-17:49/23	06:41	05:35	04:56	05:05	05:51	06:46	07:39 18:03-18:15/12	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53 17:25-17:49/24	06:38	05:34	04:56	05:06	05:53	06:47	07:41 18:03-18:12/9	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51 17:26-17:49/23	06:36	05:32	04:55	05:08	05:55	06:49	07:42 18:05-18:10/5	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49 17:26-17:47/21	06:34	05:30	04:55	05:09	05:56	06:51	07:44 18:07-18:08/1	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46 17:27-17:46/19	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44 17:28-17:44/16	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41 17:30-17:42/12	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39 17:33-17:37/4	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:36	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:32	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	08:09	08:07	08:41
	16:51	17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19 18:12-18:22/10	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21 18:09-18:24/15	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23 18:07-18:26/19	07:18	08:15	08:41
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	231	0	0	0	0	0	44	192	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA08 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	Novembe	Dezember
1	08:41	08:12	07:14 17:30-17:33/3	07:00	05:51	05:02	04:58	05:38	06:32	07:24 17:55-18:34/39	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:16	19:03	16:53	16:09
2	08:41	08:10	07:12 17:26-17:35/9	06:57	05:49	05:01	04:59	05:39	06:33	07:26 17:55-18:32/37	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10 17:24-17:37/13	06:55	05:47	05:00	05:00	05:41	06:35	07:28 17:54-18:30/36	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08 17:22-17:39/17	06:53	05:45	04:59	05:01	05:43	06:37	07:30 17:54-18:27/33	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:40	08:05	07:05 17:20-17:41/21	06:50	05:43	04:59	05:01	05:44	06:39	07:32 17:54-18:25/31	07:30	08:22
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:53	16:45	16:06
6	08:40	08:03	07:03 17:20-17:43/23	06:48	05:41	04:58	05:02	05:46	06:40	07:33 17:55-18:23/28	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
7	08:40	08:01	07:00 17:18-17:44/26	06:45	05:39	04:57	05:03	05:48	06:42	07:35 17:55-18:20/25	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:05
8	08:39	07:59	06:58 17:18-17:47/29	06:43	05:37	04:57	05:04	05:50	06:44	07:37 17:55-18:17/22	07:36	08:26
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56 17:18-17:49/31	06:41	05:35	04:56	05:05	05:51	06:46	07:39 17:56-18:15/19	07:37	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53 17:17-17:51/34	06:38	05:34	04:56	05:06	05:53	06:47	07:41 17:57-18:12/15	07:39	08:29
	16:26	17:23	18:17	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51 17:17-17:53/36	06:36	05:32	04:55	05:08	05:55	06:49	07:42 17:58-18:10/12	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49 17:16-17:54/38	06:34	05:30	04:55	05:09	05:56	06:51	07:44 18:01-18:08/7	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46 17:16-17:57/41	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44 17:16-17:58/42	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41 17:17-17:58/41	06:26	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
16	08:33	07:43	06:39 17:17-17:58/41	06:24	05:23	04:54	05:14	06:03	06:58 18:20-18:34/14	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:36 17:18-17:58/40	06:22	05:22	04:54	05:15	06:05	07:00 18:17-18:36/19	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34 17:20-17:58/38	06:20	05:20	04:54	05:16	06:07	07:01 18:15-18:38/23	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32 17:21-17:57/36	06:17	05:18	04:54	05:18	06:09	07:03 18:12-18:38/26	07:57	07:56	08:37
	16:40	17:41	18:34	20:31	21:24	21:57	21:42	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29 17:23-17:57/34	06:15	05:17	04:54	05:19	06:10	07:05 18:11-18:40/29	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:32	06:27 17:23-17:56/33	06:13	05:15	04:54	05:21	06:12	07:07 18:09-18:40/31	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24 17:24-17:55/31	06:11	05:14	04:54	05:22	06:14	07:08 18:08-18:40/32	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:38	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22 17:24-17:53/29	06:08	05:13	04:54	05:23	06:16	07:10 18:07-18:40/33	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19 17:25-17:52/27	06:06	05:11	04:55	05:25	06:17	07:12 18:05-18:41/36	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17 17:26-17:50/24	06:04	05:10	04:55	05:27	06:19	07:14 18:03-18:41/38	08:09	08:07	08:41
	16:51	17:52	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:14 17:28-17:48/20	06:02	05:09	04:55	05:28	06:21	07:15 18:02-18:41/39	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12 17:30-17:45/15	06:00	05:07	04:56	05:30	06:23	07:17 17:59-18:40/41	07:12	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10 17:35-17:40/5	05:57	05:06	04:56	05:31	06:24	07:19 17:58-18:39/41	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:37	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21 17:57-18:39/42	07:16	08:13	08:41
	16:59		19:53	20:49	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23 17:57-18:37/40	07:18	08:15	08:41
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:41
	17:03		19:56		21:41		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	777	0	0	0	0	0	484	304	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA09 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 16:14	08:11 17:05	07:14 16:49-17:23/34 18:00	07:00 18:59-19:22/23 19:58	05:51 18:51-20:02/71 20:53	05:02 18:55-20:45/110 21:43
2	08:41 16:15	08:10 17:07	07:12 16:49-17:21/32 18:02	06:57 19:01-19:20/19 20:00	05:49 18:51-20:02/71 20:55	05:01 18:57-20:46/109 21:44
3	08:41 16:16	08:08 17:09	07:10 16:50-17:21/31 18:04	06:55 19:04-19:17/13 20:02	05:47 18:50-20:02/72 20:57	05:00 18:57-20:47/110 21:45
4	08:41 16:17	08:06 16:38-16:39/1 17:11	07:07 16:51-17:20/29 18:06	06:53 20:04	05:45 18:50-20:02/72 20:58	04:59 18:57-20:47/110 21:46
5	08:40 16:19	08:05 16:38-16:42/4 17:13	07:05 16:51-17:19/28 18:08	06:50 20:06	05:43 18:49-20:02/73 21:00	04:59 18:58-20:48/1 21:47
6	08:40 16:20	08:03 16:37-16:44/7 17:15	07:03 16:52-17:18/26 18:10	06:48 20:07	05:41 18:49-20:02/73 21:02	04:58 18:58-20:48/110 21:48
7	08:40 16:21	08:01 16:36-16:47/11 17:17	07:00 16:53-17:15/22 18:12	06:45 20:09	05:39 18:48-20:02/74 21:04	04:57 18:59-20:49/110 21:49
8	08:39 16:23	07:59 16:35-16:49/14 17:19	06:58 16:56-17:13/17 18:14	06:43 20:11	05:37 18:49-20:03/74 21:06	04:57 18:59-20:49/110 21:50
9	08:39 16:24	07:57 16:35-16:51/16 17:21	06:56 17:00-17:10/10 18:16	06:41 20:13	05:35 18:49-20:15/86 21:07	04:56 19:00-20:49/109 21:51
10	08:38 16:26	07:55 16:33-16:52/19 17:23	06:53 18:17	06:38 20:15	05:34 18:48-20:19/91 21:09	04:56 19:00-20:49/109 21:52
11	08:37 16:27	07:53 16:33-16:55/22 17:25	06:51 17:52-17:53/1 18:19	06:36 20:17	05:32 18:49-20:23/94 21:11	04:55 19:01-20:50/109 21:53
12	08:36 16:29	07:51 16:33-16:57/24 17:27	06:48 17:49-17:54/5 18:21	06:33 20:18	05:30 18:49-20:25/96 21:13	04:55 19:02-20:50/108 21:54
13	08:36 16:30	07:49 16:34-16:59/25 17:29	06:46 17:48-17:57/9 18:23	06:31 19:24-19:36/12 20:20	05:28 18:48-20:27/99 21:14	04:54 19:01-20:50/109 21:54
14	08:35 16:32	07:47 16:34-17:01/27 17:31	06:44 17:46-17:58/12 18:25	06:29 19:18-19:42/24 20:22	05:26 18:49-20:29/100 21:16	04:54 19:02-20:51/109 21:55
15	08:34 16:34	07:45 16:34-17:04/30 17:33	06:41 17:46-18:00/14 18:27	06:26 19:13-19:45/32 20:24	05:25 18:49-20:30/101 21:18	04:54 19:02-20:51/109 21:55
16	08:33 16:35	07:43 16:35-17:06/31 17:35	06:39 17:45-18:02/17 18:29	06:24 19:11-19:47/36 20:26	05:23 18:49-20:32/103 21:19	04:54 19:03-20:51/108 21:56
17	08:32 16:37	07:41 16:35-17:07/32 17:37	06:36 17:45-18:04/19 18:31	06:22 19:08-19:50/42 20:28	05:21 18:49-20:33/104 21:21	04:54 19:03-20:52/109 21:56
18	08:31 16:39	07:39 16:36-17:10/34 17:39	06:34 17:44-18:05/21 18:32	06:20 19:06-19:52/46 20:29	05:20 18:50-20:35/105 21:23	04:54 19:03-20:52/109 21:57
19	08:30 16:40	07:37 16:38-17:12/34 17:41	06:32 17:44-18:08/24 18:34	06:17 19:03-19:52/49 20:31	05:18 18:50-20:36/106 21:24	04:54 19:04-20:52/108 21:57
20	08:29 16:42	07:35 16:40-17:15/35 17:43	06:29 17:45-18:10/25 18:36	06:15 19:02-19:54/52 20:33	05:17 18:50-20:37/107 21:26	04:54 19:04-20:52/10 21:58
21	08:27 16:44	07:32 16:40-17:16/36 17:45	06:27 17:45-18:11/26 18:38	06:13 19:00-19:55/55 20:35	05:15 18:51-20:38/107 21:27	04:54 19:04-20:53/109 21:58
22	08:26 16:46	07:30 16:41-17:18/37 17:47	06:24 17:46-18:14/28 18:40	06:10 18:59-19:56/57 20:37	05:14 18:51-20:39/108 21:29	04:54 19:05-20:53/108 21:58
23	08:25 16:48	07:28 16:43-17:21/38 17:49	06:22 17:47-18:15/28 18:42	06:08 18:58-19:57/59 20:39	05:13 18:51-20:39/108 21:30	04:54 19:05-20:53/108 21:58
24	08:24 16:50	07:26 16:45-17:23/38 17:50	06:19 17:50-18:17/27 18:43	06:06 18:57-19:58/61 20:40	05:11 18:52-20:40/108 21:32	04:55 19:04-20:53/109 21:58
25	08:22 16:51	07:24 16:47-17:23/36 17:52	06:17 17:57-18:19/22 18:45	06:04 18:56-19:59/63 20:42	05:10 18:52-20:41/109 21:33	04:55 19:05-20:54/109 21:58
26	08:21 16:53	07:21 16:49-17:23/34 17:54	06:14 17:57-18:21/24 18:47	06:02 18:55-20:00/65 20:44	05:09 18:53-20:42/109 21:35	04:55 19:05-20:53/108 21:58
27	08:19 16:55	07:19 16:49-17:24/35 17:56	06:12 17:57-18:22/25 18:49	06:00 18:54-20:00/66 20:46	05:07 18:53-20:43/110 21:36	04:56 19:05-20:54/109 21:58
28	08:18 16:57	07:17 16:49-17:23/34 17:58	06:10 17:57-18:24/27 18:51	05:57 18:53-20:01/68 20:48	05:06 18:54-20:43/109 21:37	04:56 19:05-20:54/109 21:58
29	08:16 16:59		07:07 18:57-19:25/28 19:53	05:55 18:53-20:01/68 20:49	05:05 18:54-20:44/110 21:39	04:57 19:05-20:54/109 21:58
30	08:15 17:01		07:05 18:58-19:24/26 19:55	05:53 18:52-20:02/70 20:51	05:04 18:55-20:44/109 21:40	04:57 19:05-20:54/109 21:58
31	08:13 17:03		07:02 18:59-19:24/25 19:56		05:03 18:55-20:45/110 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	0	654	662	980	2969	3270

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA09 - E-175 EP5

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58 19:05-20:54/109 21:57	05:38 18:59-20:35/96 21:23	06:31 20:16	07:24 18:27-18:34/7 19:03	07:22 16:03-16:22/19 16:53	08:17 16:09
2	04:59 19:05-20:54/109 21:57	05:39 18:59-20:32/93 21:21	06:33 20:14	07:26 18:29-18:32/3 19:01	07:24 16:03-16:19/16 16:51	08:18 16:08
3	05:00 19:05-20:54/109 21:57	05:41 18:59-20:28/89 21:19	06:35 20:12	07:28 18:58	07:26 16:04-16:17/13 16:49	08:20 16:08
4	05:00 19:05-20:54/109 21:56	05:43 18:59-20:23/84 21:17	06:37 20:09	07:30 17:40-17:43/3 18:56	07:28 16:06-16:16/10 16:47	08:21 16:07
5	05:01 19:05-20:54/109 21:56	05:44 18:58-20:12/74 21:15	06:38 20:07	07:31 17:34-17:49/15 18:53	07:30 16:06-16:14/8 16:45	08:22 16:06
6	05:02 19:05-20:54/109 21:55	05:46 18:59-20:13/74 21:13	06:40 20:04	07:33 17:31-17:51/20 18:51	07:32 16:08-16:12/4 16:43	08:24 16:06
7	05:03 19:05-20:54/109 21:54	05:48 18:58-20:12/74 21:11	06:42 20:02	07:35 17:29-17:53/24 18:49	07:34 16:09-16:10/1 16:42	08:25 16:05
8	05:04 19:04-20:54/110 21:54	05:49 18:59-20:12/73 21:09	06:44 20:00	07:37 17:27-17:53/26 18:46	07:36 16:40	08:26 16:05
9	05:05 19:04-20:54/110 21:53	05:51 18:59-20:12/73 21:07	06:45 18:58-19:11/13 19:57	07:39 17:25-17:54/29 18:44	07:37 16:38	08:28 16:05
10	05:06 19:04-20:54/110 21:52	05:53 18:59-20:11/72 21:05	06:47 18:55-19:13/18 19:55	07:41 17:24-17:55/31 18:42	07:39 16:36	08:29 16:04
11	05:07 19:04-20:54/110 21:51	05:55 18:59-20:11/72 21:03	06:49 18:52-19:14/22 19:52	07:42 17:23-17:55/32 18:39	07:41 16:35	08:30 16:04
12	05:09 19:04-20:53/109 21:50	05:56 19:00-20:10/70 21:01	06:51 18:50-19:15/25 19:50	07:44 17:23-17:56/33 18:37	07:43 16:33	08:31 16:04
13	05:10 19:03-20:53/110 21:49	05:58 19:00-20:09/69 20:59	06:52 18:49-19:15/26 19:47	07:46 17:22-17:56/34 18:34	07:45 16:31	08:32 16:04
14	05:11 19:03-20:53/110 21:48	06:00 19:00-20:09/69 20:57	06:54 18:48-19:16/28 19:45	07:48 17:22-17:56/34 18:32	07:47 16:30	08:33 16:04
15	05:12 19:02-20:52/110 21:47	06:02 19:00-20:07/67 20:55	06:56 18:47-19:14/27 19:42	07:50 17:21-17:56/35 18:30	07:49 16:28	08:34 16:04
16	05:14 19:03-20:52/109 21:46	06:03 19:01-20:07/66 20:53	06:58 18:46-19:12/26 19:40	07:52 17:21-17:56/35 18:28	07:51 16:27	08:35 16:04
17	05:15 19:02-20:52/110 21:45	06:05 19:02-20:06/64 20:51	06:59 18:46-19:10/24 19:38	07:54 17:18-17:55/37 18:25	07:53 16:25	08:36 16:04
18	05:16 19:02-20:51/109 21:44	06:07 19:02-20:05/63 20:49	07:01 18:45-19:07/22 19:35	07:55 17:15-17:54/39 18:23	07:54 16:24	08:37 16:04
19	05:18 19:01-20:50/109 21:42	06:09 19:03-20:04/61 20:46	07:03 18:37-19:04/27 19:33	07:57 17:14-17:51/37 18:21	07:56 16:22	08:37 16:05
20	05:19 19:02-20:50/108 21:41	06:10 19:04-20:03/59 20:44	07:05 18:34-19:02/28 19:30	07:59 17:12-17:49/37 18:18	07:58 16:21	08:38 16:05
21	05:20 19:01-20:49/108 21:40	06:12 19:04-20:01/57 20:42	07:07 18:32-19:00/28 19:28	08:01 17:11-17:47/36 18:16	08:00 16:20	08:39 16:05
22	05:22 19:01-20:48/107 21:38	06:14 19:05-20:00/55 20:40	07:08 18:30-18:57/27 19:25	08:03 17:10-17:44/34 18:14	08:02 16:18	08:39 16:06
23	05:23 19:01-20:48/107 21:37	06:16 19:07-19:58/51 20:37	07:10 18:29-18:54/25 19:23	08:05 17:08-17:42/34 18:12	08:03 16:17	08:40 16:06
24	05:25 19:00-20:47/107 21:36	06:17 19:07-19:56/49 20:35	07:12 18:28-18:52/24 19:20	08:07 17:06-17:40/34 18:10	08:05 16:16	08:40 16:07
25	05:26 19:01-20:46/105 21:34	06:19 19:09-19:54/45 20:33	07:14 18:28-18:50/22 19:18	07:09 16:05-16:37/32 17:08	08:07 16:15	08:40 16:08
26	05:28 19:00-20:45/105 21:33	06:21 19:11-19:52/41 20:30	07:15 18:26-18:47/21 19:15	07:11 16:04-16:35/31 17:05	08:09 16:14	08:41 16:08
27	05:30 18:59-20:43/104 21:31	06:23 19:13-19:49/36 20:28	07:17 18:26-18:44/18 19:13	07:12 16:04-16:33/29 17:03	08:10 16:13	08:41 16:09
28	05:31 19:00-20:42/102 21:29	06:24 19:16-19:46/30 20:26	07:19 18:26-18:42/16 19:10	07:14 16:03-16:30/27 17:01	08:12 16:12	08:41 16:10
29	05:33 18:59-20:40/101 21:28	06:26 19:19-19:43/24 20:24	07:21 18:27-18:40/13 19:08	07:16 16:03-16:28/25 16:59	08:13 16:11	08:41 16:11
30	05:34 18:59-20:39/100 21:26	06:28 19:25-19:35/10 20:21	07:22 18:27-18:37/10 19:06	07:18 16:03-16:26/23 16:57	08:15 16:10	08:41 16:12
31	05:36 18:59-20:36/97 21:24	06:30 20:19		07:20 16:03-16:24/21 16:55		08:41 16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	3330	1860	490	837	71	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA10 - E-70 E4 (M2)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai	Juni
1	08:41		08:12	09:54-10:14/20	07:15	07:00	05:51	05:02
	16:14		17:05	08:58-09:11/13	18:00	19:58	20:53	21:43
2	08:41		08:10	09:54-10:13/19	07:12	06:57	05:49	05:01
	16:15		17:07	08:59-09:12/13	18:02	20:00	20:55	21:44
3	08:41		08:08	09:57-10:13/16	07:10	06:55	05:47	05:00
	16:16		17:09	09:00-09:11/11	18:04	20:02	20:57	21:45
4	08:41		08:06	09:58-10:11/13	07:08	06:53	05:45	04:59
	16:18		17:11	09:01-09:10/9	18:06	20:04	20:59	21:46
5	08:41		08:05	10:01-10:09/8	07:05	06:50	05:43	04:59
	16:19		17:13	09:03-09:09/6	18:08	20:06	21:00	21:47
6	08:40		08:03		07:03	06:48	05:41	04:58
	16:20		17:15		18:10	20:07	21:02	21:48
7	08:40		08:01		07:01	06:45	05:39	04:57
	16:21		17:17		18:12	20:09	21:04	21:49
8	08:39		07:59		06:58	06:43	05:37	04:57
	16:23		17:19		18:14	20:11	21:06	21:50
9	08:39		07:57		06:56	06:41	05:35	04:56
	16:24		17:21		18:16	20:13	21:07	21:51
10	08:38		07:55	16:44-16:49/5	06:53	06:38	05:34	04:56
	16:26		17:23	08:34-08:38/4	18:17	20:15	21:09	21:52
11	08:37		07:53	16:41-16:50/9	06:51	06:36	05:32	04:55
	16:27		17:25	08:32-08:40/8	18:19	20:17	21:11	21:53
12	08:37		07:51	16:40-16:51/11	06:49	06:34	05:30	04:55
	16:29		17:27	08:31-08:42/11	18:21	20:18	21:13	21:54
13	08:36		07:49	16:40-16:52/12	06:46	06:31	05:28	04:55
	16:30		17:29	08:29-08:41/12	18:23	20:20	21:14	21:54
14	08:35	09:56-10:02/6	07:47	16:40-16:52/12	06:44	06:29	05:27	04:54
	16:32		17:31	08:29-08:42/13	18:25	20:22	21:16	21:55
15	08:34	09:54-10:05/11	07:45	16:40-16:52/12 16:53-17:00/7	06:41	06:27	05:25	04:54
	16:34		17:33	08:29-08:42/13	18:27	20:24	21:18	21:56
16	08:33	09:53-10:07/14	07:43	16:41-16:51/10 16:52-17:01/9	06:39	06:24	05:23	04:54
	16:35		17:35	08:30-08:42/12	18:29	20:26	21:19	21:56
17	08:32	09:53-10:08/15	07:41	16:42-17:02/20	06:36	06:22	05:22	04:54
	16:37		17:37	08:31-08:41/10	18:31	20:28	21:21	21:57
18	08:31	09:52-10:09/17	07:39	16:44-16:47/3 16:50-17:02/12	06:34	06:20	05:20	04:54
	16:39		17:39	08:31-08:39/8	18:32	20:29	21:23	21:57
19	08:30	09:51-10:10/19	07:37	16:50-17:02/12	06:32	06:17	05:18	04:54
	16:40		17:41		18:34	20:31	21:24	21:57
20	08:29	09:51-10:12/21	07:35	16:51-17:02/11	06:29	06:15	05:17	04:54
	16:42		17:43		18:36	20:33	21:26	21:58
21	08:28	09:51-10:12/21	07:33	16:52-17:01/9	06:27	06:13	05:15	04:54
	16:44		17:45		18:38	20:35	21:27	21:58
22	08:26	09:51-10:13/22	07:30	16:53-16:59/6	06:24	06:11	05:14	04:54
	16:46		17:47		18:40	20:37	21:29	21:58
23	08:25	09:50-10:13/23	07:28		06:22	06:08	05:13	04:54
	16:48		17:49		18:42	20:39	21:30	21:58
24	08:24	09:51-10:14/23	07:26		06:19	06:06	05:11	04:55
	16:50		17:51		18:44	20:40	21:32	21:58
25	08:22	09:50-10:14/24	07:24		06:17	06:04	05:10	04:55
	16:51		17:53		18:45	20:42	21:33	21:58
26	08:21	09:51-10:15/24	07:21		06:15	06:02	05:09	04:55
	16:53	09:02-09:06/4	17:54		18:47	20:44	21:35	21:58
27	08:19	09:51-10:15/24	07:19		06:12	06:00	05:07	04:56
	16:55	09:00-09:08/8	17:56		18:49	20:46	21:36	21:58
28	08:18	09:51-10:15/24	07:17		06:10	05:57	05:06	04:56
	16:57	08:59-09:09/10	17:58		18:51	20:48	21:38	21:58
29	08:16	09:52-10:16/24			07:07	05:55	05:05	04:57
	16:59	08:59-09:11/12			19:53	20:50	21:39	21:58
30	08:15	09:52-10:15/23			07:05	05:53	05:04	04:58
	17:01	08:58-09:11/13			19:55	20:51	21:40	21:58
31	08:13	09:53-10:15/22			07:02		05:03	
	17:03	08:58-09:11/13			19:56		21:42	
Sonnenscheinstunden	251		274		367	420	493	509
Anzahl Minuten mit Schatten	417		379		0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA10 - E-70 E4 (M2)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22 16:13-16:17/4	08:17
	21:57	21:23	20:17	19:03	16:53 08:04-08:07/3	16:09
2	04:59	05:39	06:33	07:26	07:24	08:18
	21:57	21:21	20:14	19:01	16:51	16:08
3	05:00	05:41	06:35	07:28	07:26	08:20
	21:57	21:19	20:12	18:58	16:49	16:08
4	05:01	05:43	06:37	07:30	07:28	08:21
	21:56	21:17	20:09	18:56	16:47	16:07
5	05:01	05:44	06:39	07:32	07:30	08:23
	21:56	21:15	20:07	18:54	16:45	16:06
6	05:02	05:46	06:40	07:33	07:32 09:30-09:39/9	08:24
	21:55	21:13	20:05	18:51	16:44 08:32-08:39/7	16:06
7	05:03	05:48	06:42	07:35	07:34 09:28-09:41/13	08:25
	21:54	21:11	20:02	18:49	16:42 08:31-08:40/9	16:05
8	05:04	05:50	06:44	07:37	07:36 09:26-09:43/17	08:27
	21:54	21:09	20:00	18:46	16:40 08:30-08:41/11	16:05
9	05:05	05:51	06:46	07:39	07:38 09:25-09:44/19	08:28
	21:53	21:08	19:57	18:44	16:38 08:29-08:42/13	16:05
10	05:06	05:53	06:47	07:41	07:39 09:24-09:45/21	08:29
	21:52	21:06	19:55	18:42	16:36 08:29-08:42/13	16:04
11	05:08	05:55	06:49	07:42	07:41 09:24-09:46/22	08:30
	21:51	21:03	19:52	18:39	16:35 08:30-08:43/13	16:04
12	05:09	05:56	06:51	07:44	07:43 09:24-09:47/23	08:31
	21:50	21:01	19:50	18:37	16:33 08:30-08:43/13	16:04
13	05:10	05:58	06:53	07:46	07:45 09:24-09:48/24	08:32
	21:49	20:59	19:47	18:35	16:31 08:31-08:42/11	16:04
14	05:11	06:00	06:54	07:48	07:47 09:24-09:48/24	08:33
	21:48	20:57	19:45	18:32	16:30 08:32-08:42/10	16:04
15	05:12	06:02	06:56	07:50	07:49 09:24-09:48/24	08:34
	21:47	20:55	19:43	18:30	16:28 08:33-08:41/8	16:04
16	05:14	06:03	06:58	07:52	07:51 09:24-09:48/24	08:35
	21:46	20:53	19:40	18:28	16:27 08:35-08:39/4	16:04
17	05:15	06:05	07:00	07:54	07:53 09:24-09:48/24	08:36
	21:45	20:51	19:38	18:25	16:25	16:04
18	05:16	06:07	07:01	07:55	07:54 09:25-09:48/23	08:37
	21:44	20:49	19:35	18:23	16:24	16:04
19	05:18	06:09	07:03	07:57	07:56 09:25-09:48/23	08:37
	21:43	20:46	19:33	18:21	16:22	16:05
20	05:19	06:10	07:05	07:59 17:23-17:31/8	07:58 09:26-09:48/22	08:38
	21:41	20:44	19:30	18:19	16:21	16:05
21	05:21	06:12	07:07	08:01 17:22-17:32/10	08:00 09:27-09:48/21	08:39
	21:40	20:42	19:28	18:16	16:20	16:05
22	05:22	06:14	07:08	08:03 17:21-17:32/11	08:02 09:27-09:48/21	08:39
	21:39	20:40	19:25	18:14	16:18	16:06
23	05:23	06:16	07:10	08:05 09:04-09:07/3	08:03 09:28-09:47/19	08:40
	21:37	20:37	19:23	18:12 17:21-17:33/12	16:17	16:06
24	05:25	06:17	07:12	08:07 17:13-17:19/6 17:21-17:32/11	08:05 09:30-09:47/17	08:40
	21:36	20:35	19:20	18:10 09:01-09:10/9	16:16	16:07
25	05:27	06:19	07:14	07:09 16:11-16:20/9 16:21-16:32/11	08:07 09:31-09:47/16	08:41
	21:34	20:33	19:18	17:08 08:00-08:11/11	16:15	16:08
26	05:28	06:21	07:15	07:11 16:10-16:21/11 16:22-16:31/9	08:09 09:31-09:45/14	08:41
	21:33	20:31	19:15	17:05 07:59-08:11/12	16:14	16:08
27	05:30	06:23	07:17	07:13 16:10-16:21/11 16:23-16:28/5	08:10 09:33-09:44/11	08:41
	21:31	20:28	19:13	17:03 07:59-08:11/12	16:13	16:09
28	05:31	06:25	07:19	07:14 16:09-16:21/12	08:12 09:36-09:43/7	08:41
	21:29	20:26	19:11	17:01 07:59-08:11/12	16:12	16:10
29	05:33	06:26	07:21	07:16 16:09-16:21/12	08:14	08:41
	21:28	20:24	19:08	16:59 07:59-08:11/12	16:11	16:11
30	05:34	06:28	07:23	07:18 16:10-16:20/10	08:15	08:42
	21:26	20:21	19:06	16:57 07:59-08:10/11	16:10	16:12
31	05:36	06:30		07:20 16:11-16:19/8		08:42
	21:24	20:19		16:55 08:00-08:09/9		16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	247	557	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA11 - E-70 E4 (M3)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar		März	April	Mai		Juni
1	08:41		08:12	15:45-15:59/14	07:15	07:00	05:51		05:02
	16:14		17:05	16:00-16:14/14	18:00	19:58	20:53		21:43
2	08:41		08:10	15:46-16:14/28	07:12	06:57	05:49		05:01
	16:15		17:07		18:02	20:00	20:55		21:44
3	08:41		08:08	15:47-15:58/11	07:10	06:55	05:47		05:00
	16:16		17:09	15:59-16:15/16	18:04	20:02	20:57		21:45
4	08:41		08:06	15:50-15:57/7	07:08	06:53	05:45		04:59
	16:18		17:11	16:00-16:16/16	18:06	20:04	20:59		21:46
5	08:41		08:05	16:00-16:16/16	07:05	06:50	05:43	20:23-20:28/5	04:59
	16:19		17:13		18:08	20:06	21:00		21:47
6	08:40		08:03	16:00-16:16/16	07:03	06:48	05:41	20:21-20:29/8	04:58
	16:20		17:15		18:10	20:07	21:02		21:48
7	08:40		08:01	16:01-16:16/15	07:00	06:45	05:39	20:20-20:29/9	04:57
	16:21		17:17		18:12	20:09	21:04		21:49
8	08:39		07:59	16:02-16:15/13	06:58	06:43	05:37	20:20-20:30/10	04:57
	16:23		17:19		18:14	20:11	21:06		21:50
9	08:39		07:57	08:44-08:52/8	06:56	06:41	05:35	20:20-20:30/10	04:56
	16:24		17:21	16:03-16:14/11	18:16	20:13	21:07		21:51
10	08:38		07:55	08:42-08:54/12	06:53	06:38	05:34	20:19-20:30/11	04:56
	16:26		17:23	16:05-16:12/7	18:17	20:15	21:09		21:52
11	08:37		07:53	08:41-08:55/14	06:51	06:36	05:32	20:20-20:30/10	04:55
	16:27		17:25		18:19	20:17	21:11		21:53
12	08:37		07:51	08:40-08:55/15	06:49	06:34	05:30	20:21-20:29/8	04:55
	16:29		17:27		18:21	20:18	21:13		21:54
13	08:36		07:49	08:40-08:55/15	06:46	06:31	05:28	20:21-20:27/6	04:54
	16:30		17:29		18:23	20:20	21:14		21:54
14	08:35		07:47	08:40-08:55/15	06:44	06:29	05:26		04:54
	16:32		17:31		18:25	20:22	21:16		21:55
15	08:34		07:45	08:40-08:55/15	06:41	06:26	05:25		04:54
	16:34		17:33		18:27	20:24	21:18		21:56
16	08:33		07:43	08:40-08:55/15	06:39	06:24	05:23		04:54
	16:35		17:35		18:29	20:26	21:19		21:56
17	08:32		07:41	08:41-08:55/14	06:36	06:22	05:22		04:54
	16:37		17:37		18:31	20:28	21:21		21:57
18	08:31		07:39	08:41-08:53/12	06:34	06:20	05:20		04:54
	16:39		17:39		18:32	20:29	21:23		21:57
19	08:30		07:37	08:44-08:51/7	06:32	06:17	05:18		04:54
	16:40		17:41		18:34	20:31	21:24		21:57
20	08:29		07:35		06:29	06:15	05:17		04:54
	16:42		17:43		18:36	20:33	21:26		21:58
21	08:28	15:48-15:51/3	07:32		06:27	06:13	05:15		04:54
	16:44		17:45		18:38	20:35	21:27		21:58
22	08:26	15:46-15:54/8	07:30		06:24	06:11	05:14		04:54
	16:46		17:47		18:40	20:37	21:29		21:58
23	08:25	15:45-15:55/10	07:28		06:22	06:08	05:13		04:54
	16:48		17:49		18:42	20:39	21:30		21:58
24	08:24	15:44-15:57/13	07:26		06:19	06:06	05:11		04:55
	16:50		17:51		18:44	20:40	21:32		21:58
25	08:22	15:44-15:58/14	07:24		06:17	06:04	05:10		04:55
	16:51		17:52		18:45	20:42	21:33		21:58
26	08:21	15:44-15:59/15	07:21		06:15	06:02	05:09		04:55
	16:53		17:54		18:47	20:44	21:35		21:58
27	08:19	15:43-15:59/16	07:19		06:12	06:00	05:07		04:56
	16:55		17:56		18:49	20:46	21:36		21:58
28	08:18	15:43-15:59/16	07:17		06:10	05:57	05:06		04:56
	16:57		17:58		18:51	20:48	21:38		21:58
29	08:16	15:44-16:00/16			07:07	05:55	05:05		04:57
	16:59	16:04-16:10/6			19:53	20:50	21:39		21:58
30	08:15	15:44-16:00/16			07:05	05:53	05:04		04:58
	17:01	16:02-16:12/10			19:55	20:51	21:40		21:58
31	08:13	15:44-16:00/16			07:02		05:03		
	17:03	16:01-16:13/12			19:56		21:41		
Sonnenscheinstunden	251		274		367	420	493		509
Anzahl Minuten mit Schatten	171		326		0	0	77		0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA11 - E-70 E4 (M3)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli		August		September	Oktober		November		Dezember
1	04:58		05:38	20:31-20:40/9	06:32	07:24		07:22	08:11-08:22/11	08:17
	21:57		21:23		20:16	19:03		16:53	15:33-15:41/8	16:09
2	04:59		05:39	20:31-20:41/10	06:33	07:26		07:24	08:14-08:21/7	08:18
	21:57		21:21		20:14	19:01		16:51	15:31-15:43/12	16:08
3	05:00		05:41	20:30-20:40/10	06:35	07:28		07:26	15:31-15:45/14	08:20
	21:57		21:19		20:12	18:58		16:49		16:08
4	05:01		05:43	20:30-20:41/11	06:37	07:30		07:28	15:30-15:45/15	08:21
	21:56		21:17		20:09	18:56		16:47		16:07
5	05:01		05:44	20:30-20:40/10	06:39	07:32		07:30	15:30-15:46/16	08:23
	21:56		21:15		20:07	18:54		16:45		16:06
6	05:02		05:46	20:31-20:40/9	06:40	07:33		07:32	15:30-15:46/16	08:24
	21:55		21:13		20:04	18:51		16:43		16:06
7	05:03		05:48	20:31-20:38/7	06:42	07:35		07:34	15:19-15:27/8	08:25
	21:54		21:11		20:02	18:49		16:42	15:30-15:46/16	16:05
8	05:04		05:50	20:33-20:36/3	06:44	07:37		07:36	15:18-15:28/10	08:27
	21:54		21:09		20:00	18:46		16:40	15:30-15:46/16	16:05
9	05:05		05:51		06:46	07:39		07:38	15:16-15:45/29	08:28
	21:53		21:07		19:57	18:44		16:38		16:05
10	05:06		05:53		06:47	07:41		07:39	15:16-15:30/14	08:29
	21:52		21:05		19:55	18:42		16:36	15:31-15:45/14	16:04
11	05:07		05:55		06:49	07:42		07:41	15:15-15:31/16	08:30
	21:51		21:03		19:52	18:39		16:35	15:32-15:44/12	16:04
12	05:09		05:56		06:51	07:44		07:43	15:15-15:31/16	08:31
	21:50		21:01		19:50	18:37		16:33	15:33-15:42/9	16:04
13	05:10		05:58		06:53	07:46		07:45	15:16-15:32/16	08:32
	21:49		20:59		19:47	18:35		16:31	15:36-15:41/5	16:04
14	05:11		06:00		06:54	07:48		07:47	15:16-15:32/16	08:33
	21:48		20:57		19:45	18:32		16:30		16:04
15	05:12		06:02		06:56	07:50		07:49	15:16-15:32/16	08:34
	21:47		20:55		19:43	18:30		16:28		16:04
16	05:14		06:03		06:58	07:52		07:51	15:17-15:32/15	08:35
	21:46		20:53		19:40	18:28		16:27		16:04
17	05:15		06:05		07:00	07:54		07:53	15:17-15:32/15	08:36
	21:45		20:51		19:38	18:25		16:25		16:04
18	05:16		06:07		07:01	07:55		07:54	15:18-15:31/13	08:37
	21:44		20:49		19:35	18:23		16:24		16:04
19	05:18		06:09		07:03	07:57		07:56	15:20-15:30/10	08:37
	21:43		20:46		19:33	18:21		16:22		16:05
20	05:19		06:10		07:05	07:59		07:58	15:21-15:29/8	08:38
	21:41		20:44		19:30	18:19		16:21		16:05
21	05:21		06:12		07:07	08:01		08:00	15:24-15:27/3	08:39
	21:40		20:42		19:28	18:16		16:20		16:05
22	05:22		06:14		07:08	08:03		08:02		08:39
	21:39		20:40		19:25	18:14		16:18		16:06
23	05:23		06:16		07:10	08:05	09:13-09:22/9	08:03		08:40
	21:37		20:37		19:23	18:12		16:17		16:06
24	05:25		06:17		07:12	08:07	09:12-09:24/12	08:05		08:40
	21:36		20:35		19:20	18:10		16:16		16:07
25	05:26		06:19		07:14	07:09	08:10-08:24/14	08:07		08:41
	21:34		20:33		19:18	17:08		16:15		16:08
26	05:28		06:21		07:15	07:11	08:10-08:25/15	08:09		08:41
	21:33		20:31		19:15	17:05		16:14		16:08
27	05:30		06:23		07:17	07:13	08:09-08:25/16	08:10		08:41
	21:31		20:28		19:13	17:03		16:13		16:09
28	05:31		06:24		07:19	07:14	08:09-08:25/16	08:12		08:41
	21:29		20:26		19:11	17:01		16:12		16:10
29	05:33		06:26		07:21	07:16	08:09-08:25/16	08:14		08:41
	21:28		20:24		19:08	16:59		16:11		16:11
30	05:34	20:33-20:37/4	06:28		07:23	07:18	08:09-08:24/15	08:15		08:41
	21:26		20:21		19:06	16:57		16:10		16:12
31	05:36	20:31-20:38/7	06:30			07:20	08:10-08:23/13			08:41
	21:24		20:19			16:55				16:13
Sonnenscheinstunden	511		459		382	329		260		234
Anzahl Minuten mit Schatten	11		69		0	126		376		0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA12 - E-70 E4 (M5)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar		Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November		Dezember	
1	08:41	09:29-09:31/2	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22		08:17	09:10-09:23/13
	16:14		17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53		16:09	
2	08:41	09:28-09:33/5	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24		08:18	09:11-09:24/13
	16:15		17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51		16:08	
3	08:41	09:28-09:35/7	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26		08:20	09:12-09:24/12
	16:16		17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49		16:08	
4	08:41	09:28-09:35/7	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28		08:21	09:12-09:24/12
	16:18		17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47		16:07	
5	08:41	09:28-09:37/9	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30		08:23	09:13-09:24/11
	16:19		17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45		16:07	
6	08:40	09:28-09:38/10	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32		08:24	09:14-09:24/1
	16:20		17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:44		16:06	
7	08:40	09:28-09:39/11	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34		08:25	09:14-09:23/5
	16:21		17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42		16:06	
8	08:39	09:28-09:39/11	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36		08:27	09:16-09:24/8
	16:23		17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40		16:05	
9	08:39	09:28-09:40/12	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38		08:28	09:16-09:23/7
	16:24		17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38		16:05	
10	08:38	09:28-09:40/12	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39		08:29	09:17-09:22/5
	16:26		17:23	18:18	20:15	21:09	21:52	21:52	21:06	19:55	18:42	16:36		16:04	
11	08:37	09:28-09:41/13	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41		08:30	09:20-09:22/2
	16:27		17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35		16:04	
12	08:37	09:28-09:41/13	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43		08:31	
	16:29		17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33		16:04	
13	08:36	09:28-09:42/14	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45		08:32	
	16:30		17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31		16:04	
14	08:35	09:29-09:42/13	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47		08:33	
	16:32		17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30		16:04	
15	08:34	09:30-09:42/12	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49		08:34	
	16:34		17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28		16:04	
16	08:33	09:30-09:43/13	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51		08:35	09:53-09:54/1
	16:35		17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27		16:04	
17	08:32	09:31-09:43/12	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53		08:36	09:52-09:56/4
	16:37		17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25		16:04	
18	08:31	09:32-09:43/11	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:55		08:37	09:52-09:56/4
	16:39		17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24		16:04	
19	08:30	09:33-09:42/9	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56		08:37	09:52-09:57/5
	16:41		17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22		16:05	
20	08:29	09:35-09:41/6	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58		08:38	09:53-09:58/5
	16:42		17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21		16:05	
21	08:28		07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00		08:39	09:53-09:58/5
	16:44		17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20		16:05	
22	08:26		07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	09:11-09:17/6	08:39	09:54-09:59/5
	16:46		17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18		16:06	
23	08:25		07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	09:10-09:19/9	08:40	09:54-09:59/5
	16:48		17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17		16:06	
24	08:24		07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	09:09-09:20/11	08:40	09:54-09:59/5
	16:50		17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16		16:07	
25	08:22		07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	08:09	08:07	09:09-09:21/12	08:41	09:55-10:00/5
	16:51		17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15		16:08	
26	08:21		07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	09:08-09:21/13	08:41	09:56-10:00/4
	16:53		17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14		16:08	
27	08:19		07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	09:09-09:22/13	08:41	09:57-10:00/3
	16:55		17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13		16:09	
28	08:18		07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:14	08:12	09:09-09:22/13	08:41	
	16:57		17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12		16:10	
29	08:16			07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	09:10-09:23/13	08:41	
	16:59			19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11		16:11	
30	08:15			07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	09:10-09:23/13	08:42	
	17:01			19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10		16:12	
31	08:13			07:02		05:03		05:36	06:30		07:20			08:42	
	17:03			19:56		21:42		21:24	20:19		16:55			16:13	
Sonnenscheinstunden	251		274	367	420	493	509	511	459	382	329	260		234	
Anzahl Minuten mit Schatten	202		0	0	0	0	0	0	0	0	0	103		153	

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA13 - E-70 E4 (M6)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:41 09:56-10:12/16 16:14	08:12 08:52-09:02/10 17:05	07:15 18:00	07:00 19:58	05:51 20:53	05:02 21:43
2	08:41 09:56-10:13/17 16:15	08:10 08:53-09:03/10 17:07	07:12 18:02	06:57 20:00	05:49 20:55	05:01 21:44
3	08:41 09:57-10:14/17 16:16	08:08 08:54-09:02/8 17:09	07:10 18:04	06:55 20:02	05:47 20:57	05:00 21:45
4	08:41 09:57-10:13/16 16:18	08:06 08:56-09:00/4 17:11	07:08 18:06	06:53 20:04	05:45 20:59	05:00 21:46
5	08:41 09:58-10:14/16 16:19	08:05 17:13	07:05 18:08	06:50 20:06	05:43 21:00	04:59 21:47
6	08:40 09:58-10:14/16 16:20	08:03 17:15	07:03 18:10	06:48 20:07	05:41 21:02	04:58 21:48
7	08:40 09:59-10:14/15 16:21	08:01 17:17	07:01 18:12	06:45 20:09	05:39 21:04	04:57 21:49
8	08:39 10:00-10:15/15 16:23	07:59 17:19	06:58 18:14	06:43 20:11	05:37 21:06	04:57 21:50
9	08:39 10:01-10:15/14 16:24	07:57 17:21	06:56 18:16	06:41 20:13	05:35 21:07	04:56 21:51
10	08:38 10:01-10:14/13 16:26	07:55 17:23	06:53 18:17	06:38 20:15	05:34 21:09	04:56 21:52
11	08:37 10:02-10:14/12 16:27 09:14-09:18/4	07:53 17:25	06:51 18:19	06:36 20:17	05:32 21:11	04:55 21:53
12	08:37 10:03-10:13/10 16:29 09:13-09:20/7	07:51 17:27	06:49 18:21	06:34 20:18	05:30 21:13	04:55 21:54
13	08:36 10:05-10:13/8 16:30 09:13-09:21/8	07:49 17:29	06:46 18:23	06:31 20:20	05:28 21:14	04:55 21:54
14	08:35 15:47-15:52/5 09:13-09:22/9 16:32 10:08-10:11/3	07:47 17:31	06:44 18:25	06:29 20:22	05:27 21:16	04:54 21:55
15	08:34 15:46-15:54/8 16:34 09:13-09:23/10	07:45 17:33	06:41 18:27	06:27 20:24	05:25 21:18	04:54 21:56
16	08:33 15:46-15:55/9 16:35 09:13-09:24/11	07:43 17:35	06:39 18:29	06:24 20:26	05:23 21:19	04:54 21:56
17	08:32 15:46-15:56/10 16:37 09:14-09:24/10	07:41 17:37	06:36 18:31	06:22 20:28	05:22 21:21	04:54 21:57
18	08:31 15:45-15:56/11 16:39 09:14-09:25/11	07:39 17:39	06:34 18:32	06:20 20:29	05:20 21:23	04:54 21:57
19	08:30 15:45-15:57/12 16:40 09:14-09:24/10	07:37 17:41	06:32 18:34	06:17 20:31	05:18 21:24	04:54 21:57
20	08:29 15:46-15:58/12 16:42 09:15-09:25/10	07:35 17:43	06:29 18:36	06:15 20:33	05:17 21:26	04:54 21:58
21	08:28 15:46-15:58/12 09:15-09:24/9 16:44 15:59-16:05/6	07:32 17:45	06:27 18:38	06:13 20:35	05:15 21:27	04:54 21:58
22	08:26 15:47-15:58/11 09:17-09:23/6 16:46 15:59-16:07/8	07:30 17:47	06:24 18:40	06:11 20:37	05:14 21:29	04:54 21:58
23	08:25 15:47-15:57/10 09:20-09:22/2 16:48 15:58-16:08/10	07:28 17:49	06:22 18:42	06:08 20:39	05:13 21:30	04:54 21:58
24	08:24 15:48-16:09/21 16:50	07:26 17:51	06:19 18:44	06:06 20:40	05:11 21:32	04:55 21:58
25	08:22 15:49-15:56/7 16:51 15:58-16:09/11	07:24 17:53	06:17 18:45	06:04 20:42	05:10 21:33	04:55 21:58
26	08:21 15:52-15:55/3 16:53 15:58-16:10/12	07:21 17:54	06:15 18:47	06:02 20:44	05:09 21:35	04:55 21:58
27	08:19 08:54-08:59/5 16:55 15:58-16:10/12	07:19 17:56	06:12 18:49	06:00 20:46	05:07 21:36	04:56 21:58
28	08:18 08:52-09:00/8 16:57 15:59-16:10/11	07:17 17:58	06:10 18:51	05:57 20:48	05:06 21:38	04:56 21:58
29	08:16 08:52-09:02/10 16:59 16:00-16:10/10		07:07 19:53	05:55 20:50	05:05 21:39	04:57 21:58
30	08:15 08:52-09:02/10 17:01 16:01-16:09/8		07:05 19:55	05:53 20:51	05:04 21:40	04:58 21:58
31	08:13 08:52-09:02/10 17:03 16:03-16:07/4		07:02 19:56		05:03 21:41	
Sonnenscheinstunden	251	274	367	420	493	509
Anzahl Minuten mit Schatten	561	32	0	0	0	0

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA13 - E-70 E4 (M6)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	04:58	05:38	06:32	07:24	07:22	08:17 09:44-09:56/12
	21:57	21:23	20:17	19:03	16:53	16:09 08:56-09:01/5
2	04:59	05:39	06:33	07:26	07:24	08:18 09:45-09:57/12
	21:57	21:21	20:14	19:01	16:51	16:08
3	05:00	05:41	06:35	07:28	07:26	08:20 09:44-09:58/14
	21:57	21:19	20:12	18:58	16:49	16:08
4	05:01	05:43	06:37	07:30	07:28	08:21 09:44-09:59/15
	21:56	21:17	20:09	18:56	16:47	16:07
5	05:01	05:44	06:39	07:32	07:30	08:23 09:45-10:00/15
	21:56	21:15	20:07	18:54	16:45	16:06
6	05:02	05:46	06:40	07:33	07:32	08:24 09:45-10:00/15
	21:55	21:13	20:05	18:51	16:44	16:06
7	05:03	05:48	06:42	07:35	07:34 08:25-08:30/5	08:25 09:44-10:00/16
	21:54	21:11	20:02	18:49	16:42	16:05
8	05:04	05:50	06:44	07:37	07:36 08:24-08:32/8	08:27 09:45-10:02/17
	21:54	21:09	20:00	18:46	16:40	16:05
9	05:05	05:51	06:46	07:39	07:38 08:23-08:33/10	08:28 09:45-10:02/17
	21:53	21:07	19:57	18:44	16:38	16:05
10	05:06	05:53	06:47	07:41	07:39 08:23-08:33/10	08:29 09:45-10:02/17
	21:52	21:05	19:55	18:42	16:36	16:04
11	05:08	05:55	06:49	07:42	07:41 08:24-08:34/10	08:30 09:47-10:03/16
	21:51	21:03	19:52	18:39	16:35 15:34-15:38/4	16:04
12	05:09	05:56	06:51	07:44	07:43 08:24-08:34/10	08:31 09:47-10:04/17
	21:50	21:01	19:50	18:37	16:33 15:32-15:40/8	16:04
13	05:10	05:58	06:53	07:46	07:45 08:24-08:34/10	08:32 09:47-10:04/17
	21:49	20:59	19:47	18:35	16:31 15:32-15:42/10	16:04
14	05:11	06:00	06:54	07:48	07:47 08:25-08:33/8	08:33 09:48-10:04/16
	21:48	20:57	19:45	18:32	16:30 15:32-15:43/11	16:04
15	05:12	06:02	06:56	07:50	07:49 08:27-08:32/5	08:34 09:48-10:05/17
	21:47	20:55	19:43	18:30	16:28 15:31-15:43/12	16:04
16	05:14	06:03	06:58	07:52	07:51 15:25-15:28/3	08:35 09:49-10:05/16
	21:46	20:53	19:40	18:28	16:27 15:31-15:43/12	16:04
17	05:15	06:05	07:00	07:54	07:53 15:23-15:30/7	08:36 09:48-10:05/17
	21:45	20:51	19:38	18:25	16:25 15:32-15:43/11	16:04
18	05:16	06:07	07:01	07:55	07:54 15:22-15:43/21	08:37 09:49-10:06/17
	21:44	20:49	19:35	18:23	16:24	16:04
19	05:18	06:09	07:03	07:57	07:56 15:22-15:32/10 08:54-08:56/2	08:37 09:50-10:07/17
	21:43	20:46	19:33	18:21	16:22 15:33-15:43/10	16:05
20	05:19	06:10	07:05	07:59	07:58 15:22-15:33/11 08:52-08:58/6	08:38 09:51-10:07/16
	21:41	20:44	19:30	18:19	16:21 15:34-15:42/8	16:05
21	05:21	06:12	07:07	08:01	08:00 15:22-15:34/12 08:51-09:00/9	08:39 09:51-10:07/16
	21:40	20:42	19:28	18:16	16:20 15:35-15:41/6	16:05
22	05:22	06:14	07:08	08:03	08:02 15:22-15:34/12	08:39 09:52-10:08/16
	21:39	20:40	19:25	18:14	16:18 08:51-09:01/10	16:06
23	05:23	06:16	07:10	08:05	08:03 15:23-15:34/11	08:40 09:52-10:08/16
	21:37	20:37	19:23	18:12	16:17 08:51-09:01/10	16:06
24	05:25	06:17	07:12	08:07	08:05 15:23-15:34/11	08:40 09:52-10:08/16
	21:36	20:35	19:20	18:10	16:16 08:51-09:02/11	16:07
25	05:27	06:19	07:14	07:09	08:07 15:23-15:33/10	08:41 09:53-10:10/17
	21:34	20:33	19:18	17:08	16:15 08:52-09:02/10	16:08
26	05:28	06:21	07:15	07:11	08:09 15:24-15:33/9	08:41 09:53-10:10/17
	21:33	20:31	19:15	17:05	16:14 08:51-09:02/11	16:08
27	05:30	06:23	07:17	07:13	08:10 15:25-15:33/8	08:41 09:54-10:10/16
	21:31	20:28	19:13	17:03	16:13 08:52-09:02/10	16:09
28	05:31	06:24	07:19	07:14	08:12 15:27-15:32/5 08:53-09:02/9	08:41 09:54-10:11/17
	21:29	20:26	19:11	17:01	16:12 09:48-09:51/3	16:10
29	05:33	06:26	07:21	07:16	08:14 09:46-09:54/8	08:41 09:54-10:11/17
	21:28	20:24	19:08	16:59	16:11 08:54-09:02/8	16:11
30	05:34	06:28	07:23	07:18	08:15 09:46-09:55/9	08:42 09:55-10:12/17
	21:26	20:21	19:06	16:57	16:10 08:55-09:02/7	16:12
31	05:36	06:30		07:20		08:41 09:56-10:12/16
	21:24	20:19		16:55		16:13
Sonnenscheinstunden	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	421	502

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

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

Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

SHADOW - Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung **WEA:** WEA14 - E-70 E4 (M8)

Annahmen für Schattenwurfberechnung

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

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

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
418	327	439	704	579	570	916	1.076	1.140	950	732	508	8.362

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:41	08:12	07:15	07:00	05:51	05:02	04:58	05:38	06:32	07:24	07:22	08:17
	16:14	17:05	18:00	19:58	20:53	21:43	21:57	21:23	20:17	19:03	16:53	16:09
2	08:41	08:10	07:12	06:58	05:49	05:01	04:59	05:39	06:33	07:26	07:24	08:18
	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
3	08:41	08:08	07:10	06:55	05:47	05:00	05:00	05:41	06:35	07:28	07:26	08:20
	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
4	08:41	08:06	07:08	06:53	05:45	05:00	05:01	05:43	06:37	07:30	07:28	08:21
	16:18	17:11	18:06	20:04	20:59	21:46	21:56	21:17	20:09	18:56	16:47	16:07
5	08:41	08:05	07:05	06:50	05:43	04:59	05:01	05:44	06:39	07:32	07:30	08:23
	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
6	08:40	08:03	07:03	06:48	05:41	04:58	05:02	05:46	06:40	07:33	07:32	08:24
	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:05	18:51	16:44	16:06
7	08:40	08:01	07:01	06:45	05:39	04:57	05:03	05:48	06:42	07:35	07:34	08:25
	16:21	17:17	18:12	20:09	21:04	21:49	21:54	21:11	20:02	18:49	16:42	16:06
8	08:39	07:59	06:58	06:43	05:37	04:57	05:04	05:50	06:44	07:37	07:36	08:27
	16:23	17:19	18:14	20:11	21:06	21:50	21:54	21:09	20:00	18:46	16:40	16:05
9	08:39	07:57	06:56	06:41	05:35	04:56	05:05	05:51	06:46	07:39	07:38	08:28
	16:24	17:21	18:16	20:13	21:07	21:51	21:53	21:08	19:57	18:44	16:38	16:05
10	08:38	07:55	06:53	06:38	05:34	04:56	05:06	05:53	06:47	07:41	07:39	08:29
	16:26	17:23	18:18	20:15	21:09	21:52	21:52	21:05	19:55	18:42	16:36	16:04
11	08:37	07:53	06:51	06:36	05:32	04:55	05:08	05:55	06:49	07:43	07:41	08:30
	16:27	17:25	18:19	20:17	21:11	21:53	21:51	21:03	19:52	18:39	16:35	16:04
12	08:37	07:51	06:49	06:34	05:30	04:55	05:09	05:56	06:51	07:44	07:43	08:31
	16:29	17:27	18:21	20:18	21:13	21:54	21:50	21:01	19:50	18:37	16:33	16:04
13	08:36	07:49	06:46	06:31	05:28	04:55	05:10	05:58	06:53	07:46	07:45	08:32
	16:30	17:29	18:23	20:20	21:14	21:54	21:49	20:59	19:47	18:35	16:31	16:04
14	08:35	07:47	06:44	06:29	05:27	04:54	05:11	06:00	06:54	07:48	07:47	08:33
	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
15	08:34	07:45	06:41	06:27	05:25	04:54	05:12	06:02	06:56	07:50	07:49	08:34
	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
16	08:33	07:43	06:39	06:24	05:23	04:54	05:14	06:03	06:58	07:52	07:51	08:35
	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:28	16:27	16:04
17	08:32	07:41	06:37	06:22	05:22	04:54	05:15	06:05	07:00	07:54	07:53	08:36
	16:37	17:37	18:31	20:28	21:21	21:57	21:45	20:51	19:38	18:25	16:25	16:04
18	08:31	07:39	06:34	06:20	05:20	04:54	05:16	06:07	07:01	07:55	07:54	08:37
	16:39	17:39	18:32	20:29	21:23	21:57	21:44	20:49	19:35	18:23	16:24	16:04
19	08:30	07:37	06:32	06:17	05:18	04:54	05:18	06:09	07:03	07:57	07:56	08:37
	16:41	17:41	18:34	20:31	21:24	21:57	21:43	20:46	19:33	18:21	16:22	16:05
20	08:29	07:35	06:29	06:15	05:17	04:54	05:19	06:10	07:05	07:59	07:58	08:38
	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
21	08:28	07:33	06:27	06:13	05:15	04:54	05:21	06:12	07:07	08:01	08:00	08:39
	16:44	17:45	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:20	16:05
22	08:26	07:30	06:24	06:11	05:14	04:54	05:22	06:14	07:08	08:03	08:02	08:39
	16:46	17:47	18:40	20:37	21:29	21:58	21:39	20:40	19:25	18:14	16:18	16:06
23	08:25	07:28	06:22	06:08	05:13	04:54	05:24	06:16	07:10	08:05	08:03	08:40
	16:48	17:49	18:42	20:39	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
24	08:24	07:26	06:19	06:06	05:11	04:55	05:25	06:17	07:12	08:07	08:05	08:40
	16:50	17:51	18:44	20:40	21:32	21:58	21:36	20:35	19:20	18:10	16:16	16:07
25	08:22	07:24	06:17	06:04	05:10	04:55	05:27	06:19	07:14	07:09	08:07	08:41
	16:52	17:53	18:45	20:42	21:33	21:58	21:34	20:33	19:18	17:08	16:15	16:08
26	08:21	07:21	06:15	06:02	05:09	04:55	05:28	06:21	07:15	07:11	08:09	08:41
	16:53	17:54	18:47	20:44	21:35	21:58	21:33	20:31	19:15	17:05	16:14	16:08
27	08:19	07:19	06:12	06:00	05:08	04:56	05:30	06:23	07:17	07:13	08:10	08:41
	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
28	08:18	07:17	06:10	05:57	05:06	04:56	05:31	06:25	07:19	07:14	08:12	08:41
	16:57	17:58	18:51	20:48	21:38	21:58	21:29	20:26	19:11	17:01	16:12	16:10
29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:14	08:41
	16:59		19:53	20:50	21:39	21:58	21:28	20:24	19:08	16:59	16:11	16:11
30	08:15		07:05	05:53	05:04	04:58	05:34	06:28	07:23	07:18	08:15	08:42
	17:01		19:55	20:51	21:40	21:58	21:26	20:21	19:06	16:57	16:10	16:12
31	08:13		07:02		05:03		05:36	06:30		07:20		08:42
	17:03		19:56		21:42		21:24	20:19		16:55		16:13
Sonnenscheinstunden	251	274	367	420	493	509	511	459	382	329	260	234
Anzahl Minuten mit Schatten	0	0	0	0	0	0	0	0	0	0	0	0

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

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

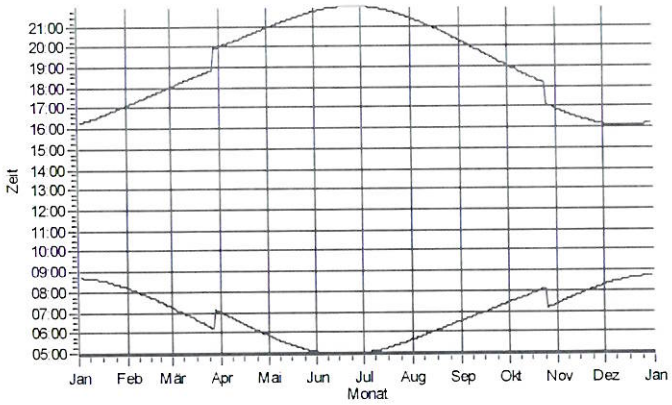
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

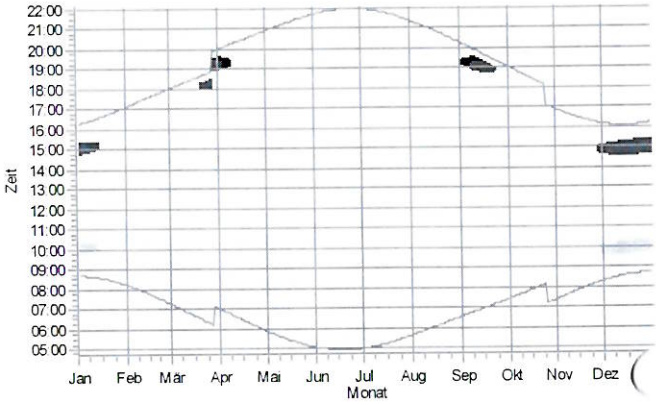
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

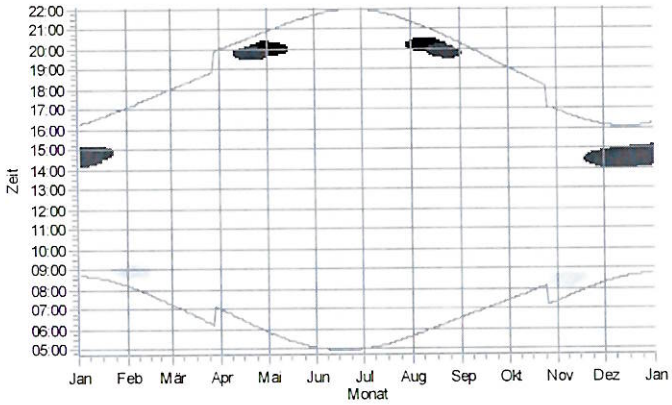
WEA01: E-138 EP3 E3



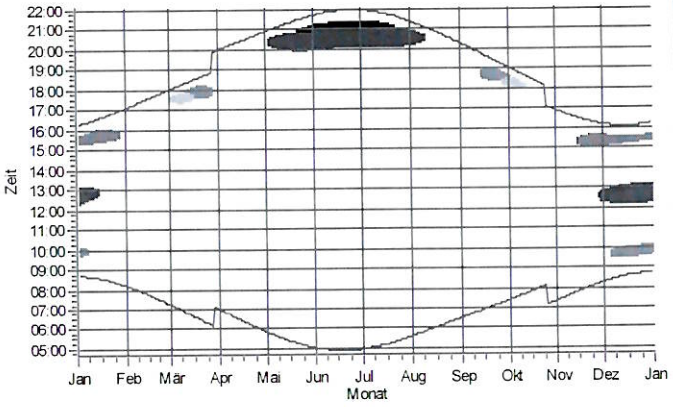
WEA02: E-175 EP5



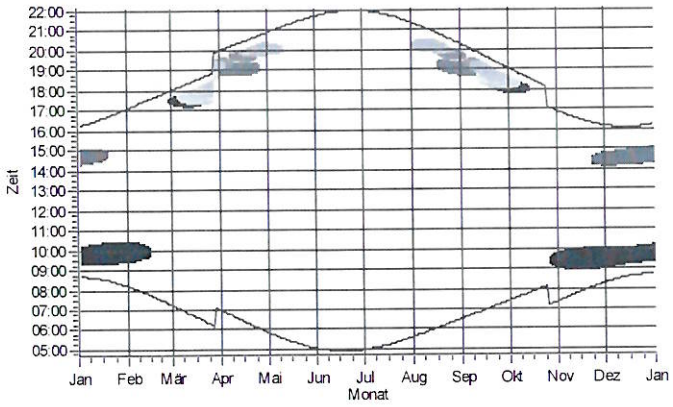
WEA03: E-175 EP5



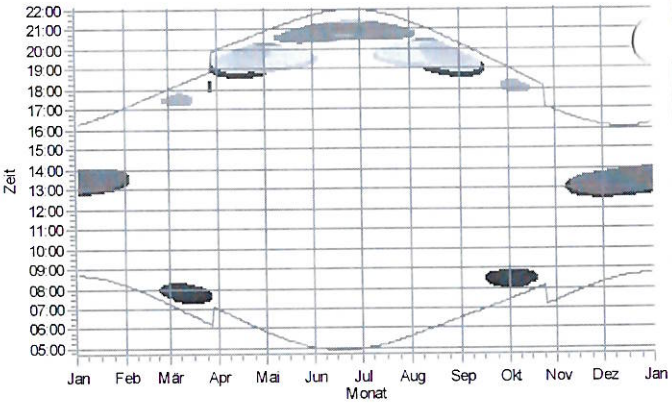
WEA04: E-175 EP5



WEA05: E-175 EP5



WEA06: E-175 EP5



Schattenrezeptoren

- IP02: Neues Moor 21, 21770 Mittelstenahe
- IP03: Mittelstenaher Str. 30, 21769 Lamstedt
- IP04: Wischhofstraße 10, 21769 Lamstedt
- IP05: Am Kamp 26, 21769 Lamstedt
- IP06: Strother Heuweg 5, 21769 Lamstedt
- IP07: Driftweg 2, 21769 Lamstedt
- IP08: Haneworth 1, 21770 Lamstedt
- IP09: Sticht 5, 21770 Mittelstenahe
- IP11: Auf dem Kampen 2, 21769 Lamstedt
- IP12: Auf dem Kampen 6, 21769 Lamstedt
- IP13: Auf dem Kampen 5, 21769 Lamstedt
- IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt
- IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt
- IP16: Kleiner Koven 15A, 21769 Lamstedt
- IP17: An der Gosche 10, 21769 Lamstedt
- IP18: Wischhofstraße 17a, 21769 Lamstedt
- IP19: Wischhofstraße 15, 21769 Lamstedt
- IP20: Wischhofstraße 13, 21769 Lamstedt
- IP21: Auf der Stroth 18, 21769 Lamstedt
- IP22: Auf der Stroth 24, 21769 Lamstedt
- IP23: Auf der Stroth 20, 21769 Lamstedt
- IP24: Auf der Stroth 23, 21769 Lamstedt
- IP25: Auf der Stroth 21, 21769 Lamstedt
- IP26: Auf der Stroth 25, 21769 Lamstedt
- IP27: Strother Heuweg 1, 21769 Lamstedt
- IP28: Strother Heuweg 9, 21769 Lamstedt
- IP30: Pappelweg 7, 21769 Lamstedt
- IP31: Jochensweg 8, 21769 Lamstedt
- IP32: Driftweg 1, 21769 Lamstedt
- IP35: Neues Moor 19, 21770 Mittelstenahe
- IP36: Haneworth 2, 21770 Lamstedt
- IP37: Mittelstenaher Str. 32, 21769 Lamstedt

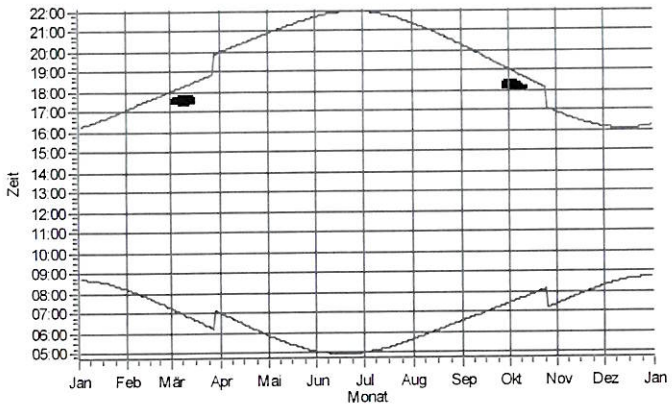
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

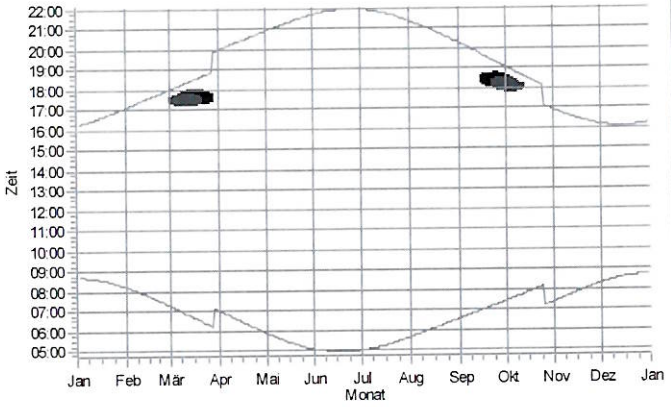
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

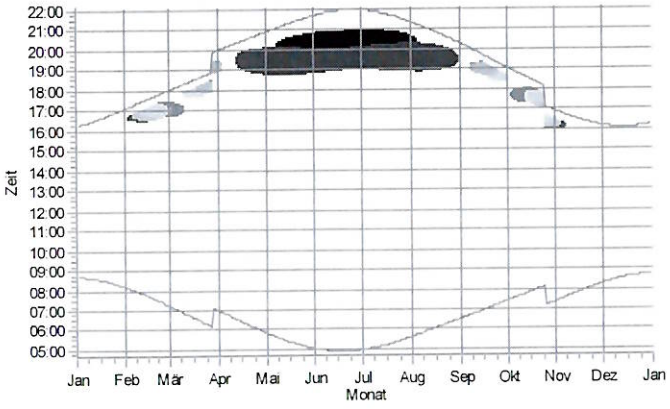
WEA07: E-175 EP5



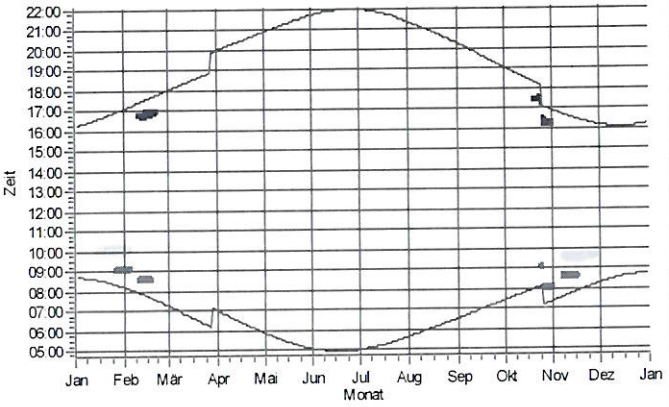
WEA08: E-175 EP5



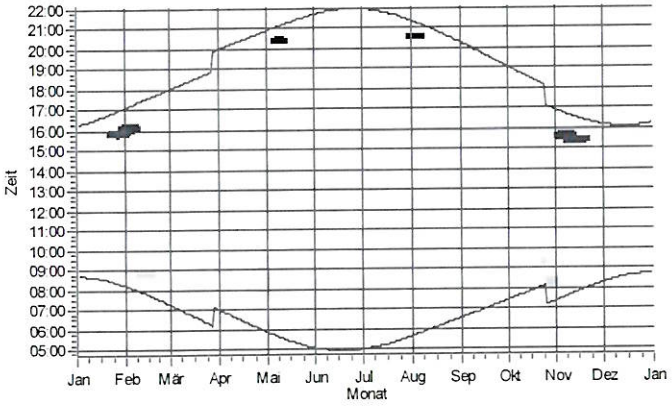
WEA09: E-175 EP5



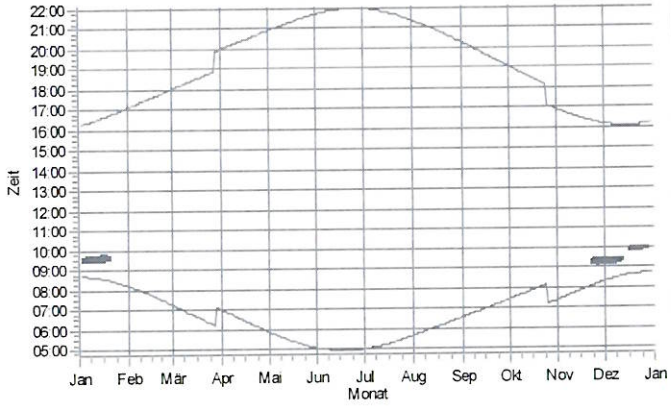
WEA10: E-70 E4 (M2)



WEA11: E-70 E4 (M3)



WEA12: E-70 E4 (M5)



Schattenrezeptoren

- IP01: Sticht 1, 21770 Mittelstenahe
- IP04: Wischhofstraße 10, 21769 Lamstedt
- IP06: Strother Heuweg 5, 21769 Lamstedt
- IP07: Driftweg 2, 21769 Lamstedt
- IP08: Haneworth 1, 21770 Lamstedt
- IP09: Sticht 5, 21770 Mittelstenahe
- IP11: Auf dem Kampen 2, 21769 Lamstedt
- IP12: Auf dem Kampen 6, 21769 Lamstedt
- IP13: Auf dem Kampen 5, 21769 Lamstedt
- IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt
- IP18: Wischhofstraße 17a, 21769 Lamstedt
- IP22: Auf der Stroth 24, 21769 Lamstedt
- IP27: Strother Heuweg 1, 21769 Lamstedt
- IP28: Strother Heuweg 9, 21769 Lamstedt
- IP32: Driftweg 1, 21769 Lamstedt
- IP34: Sticht 3, 21770 Mittelstenahe
- IP36: Haneworth 2, 21770 Lamstedt

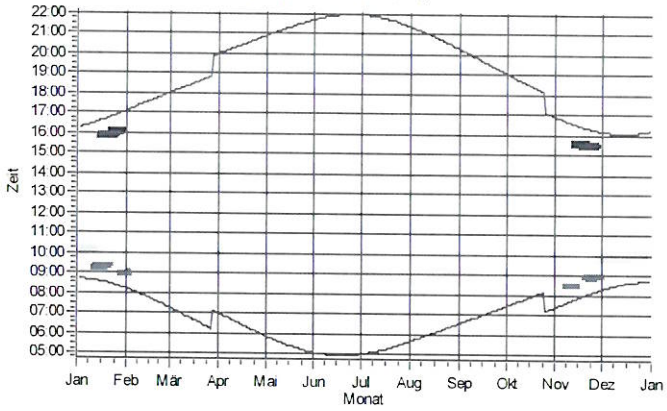
Projekt:
SW24020 Lamstedt

Lizenzierter Anwender:
windtest grevenbroich gmbh
Frimmersdorfer Straße 73a
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

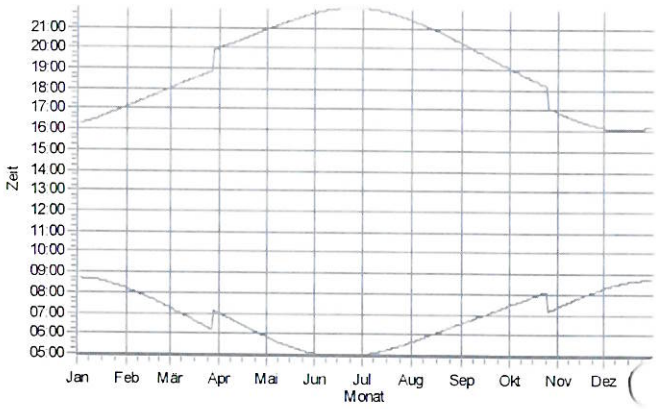
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

WEA13: E-70 E4 (M6)



WEA14: E-70 E4 (M8)



Schattenrezeptoren

IP01: Sticht 1, 21770 Mittelstenahe
IP08: Haneworth 1, 21770 Lamstedt
IP09: Sticht 5, 21770 Mittelstenahe
IP34: Sticht 3, 21770 Mittelstenahe
IP36: Haneworth 2, 21770 Lamstedt

Maßnahmen zur Verminderung von Schallemissionen

Für ENERCON Windenergieanlagen stehen verschiedene schallreduzierte Betriebsmodi zur Verfügung. Die schallreduzierten Betriebsmodi unterscheiden sich in der Intensität der Schallreduktion und erfüllen jederzeit die am Standort geltenden Anforderungen in Bezug auf zulässige Schallemissionen.

Für die Aktivierung der schallreduzierten Betriebsmodi gelten unterschiedliche Bedingungen. Die Bedingungen richten sich nach vordefinierten Zeitintervallen. Jedem Zeitintervall kann ein schallreduzierter Betriebsmodus zugeordnet werden, der die lokalen Anforderungen an die Schallemission erfüllt. Wenn die örtliche Zeit mit einer vordefinierten Tageszeit übereinstimmt, wechselt die Windenergieanlage in den entsprechenden schallreduzierten Betriebsmodus.

Bei Betrieb in einem schallreduzierten Betriebsmodus wird die Drehzahl der Windenergieanlage reduziert, wodurch die Schallemission der Windenergieanlage abnimmt. Bekommt die Steuerung der Windenergieanlage den Befehl, auf eine andere Betriebskennlinie zu wechseln, orientieren sich die Drehzahl und somit auch die Leistung an den von dieser Betriebskennlinie vorgegebenen Werten. Die Windenergieanlage passt daraufhin die Drehzahl des Rotors durch die Rotorblattverstellung an die geänderten Drehzahl-zu-Windgeschwindigkeit-Verhältnisse an und hält diese Drehzahl für die jeweilige Windgeschwindigkeit konstant.

Die Konfiguration der schallreduzierten Betriebsmodi erfolgt individuell für die entsprechende Windenergieanlage. Der Status kann über das Fernüberwachungssystem eingesehen werden.

Maßnahmen zur Verminderung von Schattenemissionen

Die Schattenabschaltung dient dazu, die Windenergieanlage bedarfsgerecht anzuhalten und so Immissionen durch periodischen Schattenwurf an relevanten Orten zu verringern oder zu vermeiden.

Periodischer Schattenwurf entsteht durch die wiederkehrende Verschattung des direkten Sonnenlichts durch die Bewegung der Rotorblätter der Windenergieanlage. Das Auftreten dieses Effekts ist abhängig von der aktuellen lokalen Wetterlage, der Ausrichtung der Gondel entsprechend der Windrichtung, dem Sonnenstand und den Betriebszeiten der Windenergieanlage.

Die Schattenabschaltung wertet die ermittelten Daten ständig aus. Die Windenergieanlage hält an, wenn an einem Immissionsort, beispielsweise an einem Wohnhaus, unzulässiger periodischer Schattenwurf zu erwarten ist.

Die Schattenabschaltungen werden im Fernüberwachungssystem als Statusmeldungen dokumentiert.

Landkreis Cuxhaven
Amt 63
18. Juni 2025
.....

© ENERCON GmbH. Alle Rechte vorbehalten.

Landkreis Cuxhaven
Amt 63
18. Juni 2025
.....

Technische Beschreibung

Schattenabschaltung

ENERCON Platform Independent Control System (PI-CS)

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid

ImG 03 / 2024

zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

Technische Änderungen vorbehalten.

ENERCON
ENERGIE FÜR DIE WELT

Herausgeber

ENERCON GmbH ▪ Dreekamp 5 ▪ 26605 Aurich ▪ Deutschland
Telefon: +49 4941 927-0 ▪ Telefax: +49 4941 927-109
E-Mail: info@enercon.de ▪ Internet: http://www.enercon.de
Geschäftsführer: Dr. Jürgen Zeschky, Dr. Martin Prillmann, Dr. Michael Jaxy
Zuständiges Amtsgericht: Aurich ▪ Handelsregisternummer: HRB 411
Ust.Id.-Nr.: DE 181 977 360

Urheberrechtshinweis

Die Inhalte dieses Dokuments sind urheberrechtlich sowie hinsichtlich der sonstigen geistigen Eigentumsrechte durch nationale und internationale Gesetze und Verträge geschützt. Die Rechte an den Inhalten dieses Dokuments liegen bei der ENERCON GmbH, sofern und soweit nicht ausdrücklich ein anderer Inhaber angegeben oder offensichtlich erkennbar ist.

Die ENERCON GmbH räumt dem Verwender das Recht ein, zu Informationszwecken für den eigenen, rein unternehmensinternen Gebrauch Kopien und Abschriften dieses Dokuments zu erstellen; weitergehende Nutzungsrechte werden dem Verwender durch die Bereitstellung dieses Dokuments nicht eingeräumt. Jegliche sonstige Vervielfältigung, Veränderung, Verbreitung, Veröffentlichung, Weitergabe, Überlassung an Dritte und/oder Verwertung der Inhalte dieses Dokuments ist – auch auszugsweise – ohne vorherige, ausdrückliche und schriftliche Zustimmung der ENERCON GmbH untersagt, sofern und soweit nicht zwingende gesetzliche Vorschriften ein Solches gestatten.

Dem Verwender ist es untersagt, für das in diesem Dokument wiedergegebene Know-how oder Teile davon gewerbliche Schutzrechte gleich welcher Art anzumelden.

Sofern und soweit die Rechte an den Inhalten dieses Dokuments nicht bei der ENERCON GmbH liegen, hat der Verwender die Nutzungsbestimmungen des jeweiligen Rechteinhabers zu beachten.

Geschützte Marken

Alle in diesem Dokument ggf. genannten Marken- und Warenzeichen sind geistiges Eigentum der jeweiligen eingetragenen Inhaber; die Bestimmungen des anwendbaren Kennzeichen- und Markenrechts gelten uneingeschränkt.

Änderungsvorbehalt

Die ENERCON GmbH behält sich vor, dieses Dokument und den darin beschriebenen Gegenstand jederzeit ohne Vorankündigung zu ändern, insbesondere zu verbessern und zu erweitern, sofern und soweit vertragliche Vereinbarungen oder gesetzliche Vorgaben dem nicht entgegenstehen.

Technische Änderungen vorbehalten.

Dokumentinformation

Dokument-ID	D02906137/1.0-de
Vermerk	Originaldokument

Datum	**Sprache**	**DCC**	**Werk / Abteilung**
2024-04-22	de	DB	WRD Wobben Research and Development GmbH / Documentation Department

Inhaltsverzeichnis

1 Allgemeines 4

2 Funktionsweise 4

2.1 Bestimmung der potentiellen Schattenwurfzeit 4

2.2 Messung der Beleuchtungsstärke 4

2.3 Abschaltautomatik 5

2.4 Erweiterte Funktionen 5

3 Sicherheit 5

4 Protokollierung 5

Technische Änderungen vorbehalten.

1 Allgemeines

Periodischer Schattenwurf ist die wiederkehrende Verschattung des direkten Sonnenlichts durch die Bewegung der Rotorblätter einer Windenergieanlage. Das Auftreten dieses Effekts ist abhängig von der aktuellen lokalen Wetterlage, der Ausrichtung der Gondel entsprechend der Windrichtung, dem Sonnenstand und den Betriebszeiten der Windenergieanlage.

2 Funktionsweise

Die Schattenabschaltung für Windenergieanlagen mit dem Steuerungstypen PI-CS erfolgt über den ENERCON SCADA Edge Server.

2.1 Bestimmung der potentiellen Schattenwurfzeit

Der Schattenabschaltung liegt ein kalendarisches System zugrunde. Die Anfangs- und Endzeiten des astronomisch möglichen Schattenwurfs für betroffene Immissionsorte werden unter Berücksichtigung der standortspezifischen Parameter wie Nabenhöhe, Rotordurchmesser und Koordinaten der Windenergieanlage sowie der Lage des Immissionsorts und dessen Topografie berechnet.

Die daraus ermittelten Abschaltzeiten werden im ENERCON SCADA Edge Server programmiert.

Ein Feinabgleich dieser Abschaltzeiten ist für jeden Immissionsort und Zeitraum jederzeit durchführbar.

2.2 Messung der Beleuchtungsstärke

Die Erzeugung periodischen Schattenwurfs ist abhängig von der Sonneneinstrahlung. Gemäß den Aussagen der Bund/Länder-Arbeitsgemeinschaft für Immissionsschutz (LAI) ist Schattenwurf zu erwarten, wenn die Sonneneinstrahlung auf der zur Einfallsrichtung normalen Ebene mehr als 120 W/m² beträgt.

Die Höhe der Beleuchtungsstärke auf einer waagerechten Messfläche wird vom Sonnenstand sowie vom fotometrischen Strahlungsäquivalent beeinflusst. Dieses wird von der Lichtbrechung und der Lufttrübung bestimmt und ist ebenfalls vom Sonnenstand abhängig. Für die Beleuchtungsstärke in Abhängigkeit zum Sonnenstand können somit nur näherungsweise Werte bestimmt werden.

Zur Messung der Beleuchtungsstärke werden die Sensoren so angeordnet, dass sich mindestens ein Sensor auf der Sonnenseite und ein Sensor auf der Schattenseite befindet.

Aus den Messwerten der Sensoren werden die höchste und die niedrigste Beleuchtungsstärke ermittelt, also die Licht- und die Schattenintensität.

Die Beurteilung, ob Schattenwurf möglich ist, erfolgt somit nicht über eine mit Toleranzen behaftete Messung der Beleuchtungsstärke, sondern über das Verhältnis von Licht- zu Schattenintensität und der daraus ermittelten Abschaltintensität.

Für eine Beleuchtungsstärke von 120 W/m² beträgt die ermittelte Abschaltintensität 36 %. Dieser Wert ist unabhängig vom Sonnenstand. Sinkt das Verhältnis von Licht- zu Schattenintensität unter 36 %, liegt eine Beleuchtungsstärke von mehr als 120 W/m² vor. Es kommt zu Schattenwurf.

Technische Änderungen vorbehalten.

2.3 Abschaltautomatik

Sobald innerhalb des programmierten Zeitfensters der eingestellte Wert der Abschaltintensität unterschritten ist, wird die Schattenabschaltung aktiviert. Eine Mittelwertbildung für die gemessene Beleuchtungsstärke erfolgt nicht. Die Abschaltautomatik reagiert auch bei einer kurzzeitigen Unterschreitung des eingestellten Werts der Abschaltintensität. Eine Verzögerungszeit für das Ansprechen der Schattenabschaltung kann über Filterzeiten definiert werden. Ein Parameter legt fest, wie lange im Mittel das Verhältnis von Licht- zu Schattenintensität unter dem voreingestellten Wert der Abschaltintensität liegen muss, damit die Schattenabschaltung aktiviert wird.

Ändern sich die Lichtverhältnisse so, dass Schattenwurf nicht mehr möglich ist, bleibt die Schattenabschaltung zunächst aktiv. Die Schattenabschaltung wird deaktiviert und die Windenergieanlage nimmt den Betrieb wieder auf, wenn das programmierte Zeitfenster abgelaufen ist oder wenn über einen vorgegebenen Zeitraum der Wert der Abschaltintensität dauerhaft überschritten wird. Ein Parameter legt fest, wie lange im Mittel das Verhältnis von Licht- zu Schattenintensität über dem voreingestellten Wert der Abschaltintensität liegen muss, damit die Schattenabschaltung deaktiviert wird.

2.4 Erweiterte Funktionen

Die Schattenabschaltung kann auch ohne Berücksichtigung der Beleuchtungsstärke erfolgen. Dabei wird die Windenergieanlage zeitgesteuert nach den im ENERCON SCADA Edge Server programmierten Zeitfenstern abgeschaltet. Die Windenergieanlage wird dann auch bei Bewölkung angehalten.

Durch die verfügbare Wochentagfunktion kann die Abschaltung auf ausgewählte Wochentage begrenzt werden. Diese Funktion ist beispielsweise für Windenergieanlagen sinnvoll, die an Industrie- oder Gewerbegebiete angrenzen, in denen an Wochenenden keine Tätigkeiten in schützenswerten Arbeitsräumen stattfinden.

Die erweiterten Funktionen können gezielt für ausgewählte Immissionsorte umgesetzt werden.

3 Sicherheit

Die Funktion der Lichtsensorik wird während des Betriebs laufend automatisch auf Plausibilität geprüft. Sind die gemessenen Werte nicht plausibel, wird eine Meldung generiert.

Durch den Ausfall eines Sensors, z. B. durch Kabelbruch oder Kurzschluss, fällt das Verhältnis von Schatten- zu Lichtintensität unter den Wert der Abschaltintensität. Die Windenergieanlage hält innerhalb des programmierten Zeitfensters an und eine Meldung wird generiert.

4 Protokollierung

Die Aktivierung der Schattenabschaltung wird vom ENERCON SCADA Edge Server als Statusmeldung mit Datum, Uhrzeit und Dauer protokolliert und über mehrere Jahre gespeichert.

Bei Bedarf erfolgt eine Protokollierung der gemessenen Daten der Lichtsensorik. Dabei wird das Verhältnis von Schatten- und Lichtintensität als Minutenmittelwert sowie das Minimum und das Maximum des Minutenintervalls und die definierte Abschaltintensität protokolliert.

Technische Änderungen vorbehalten.

Verpflichtungserklärung

über die Verwendung eines

Schattenabschaltmoduls

im WP Lamstedt

Adressat:

Landkreis Cuxhaven
Ref. Immissionsschutz
Vincent-Lübeck-Straße 2
27474 Cuxhaven

Bauvorhaben:

Windpark Lamstedt
BImSchG-Antrag Errichtung und Betrieb von Windenergieanlagen

Betreiber:

NeXtWind Windpark Beteiligung II GmbH & Co. KG
Kantstr. 164
10623 Berlin

Die NeXtWind Windpark Beteiligung II GmbH & Co. KG, 10623 Berlin, verpflichtet sich als Antragstellerin, im Windpark Lamstedt, zur Einhaltung der gesetzlich vorgeschriebenen Schattenwurfhöchstgrenzen das herstellerspezifische Schattenabschaltmodul [ENERCON Platform Independent Control System (PI-CS)] einzusetzen.

Diese Verpflichtung gilt auch gegenüber Rechtsnachfolgern, welche entsprechend unterrichtet werden.

Berlin, den 28. Mai 2025

i.V.

Antragsteller/in

Verpflichtungserklärung

über die Verwendung eines

Schattenabschaltmoduls

im WP Lamstedt

BImSchG-Genehmigung erteilt unter Hinweis auf den vorgehefteten Bescheid. Nebenbestimmungen sind dem Bescheid

ImG 03/2024

zu entnehmen. Die Prüfbemerkungen sind bei Errichtung / Betrieb der Anlage zu beachten.

Adressat: Landkreis Cuxhaven
Ref. Immissionsschutz
Vincent-Lübeck-Straße 2
27474 Cuxhaven

Bauvorhaben: **Windpark Lamstedt**
BImSchG-Antrag Errichtung und Betrieb von Windenergieanlagen

Betreiber: **NeXtWind Windpark Beteiligung 28 GmbH & Co. KG**
Marburger Str. 3
10789 Berlin

Die NeXtWind Windpark Beteiligung 28 GmbH & Co. KG, 10789 Berlin, verpflichtet sich als Antragstellerin, im Windpark Lamstedt, soweit erforderlich, ein Schattenabschaltmodul (ENERCON Platform Independent Control System (PI-CS)) einzusetzen.

Diese Verpflichtung gilt auch gegenüber Rechtsnachfolgern, welche entsprechend unterrichtet werden.

WEA	WEA Typ	Gemarkung	Flur	Flur-stück	UTM / ETRS89 (Zone 32)	
					Rechtswert	Hochwert
02	E-175 EP5	Lamstedt	22	5	502.734	5.942.224
03	E-175 EP5	Lamstedt	22	9	503.091	5.942.569
04	E-175 EP5	Lamstedt	22	12	503.576	5.942.681
05	E-175 EP5	Lamstedt	22	18	504.117	5.942.884
06	E-175 EP5	Lamstedt	24	10; 11	504.540	5.943.220
07	E-175 EP5	Lamstedt	21	37	502.739	5.941.776
08	E-175 EP5	Lamstedt	22	25	503.226	5.941.962
09	E-175 EP5	Lamstedt	22	35	503.899	5.942.394

Berlin, den 01. Dezember 2025

i.V.

Antragsteller/in