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

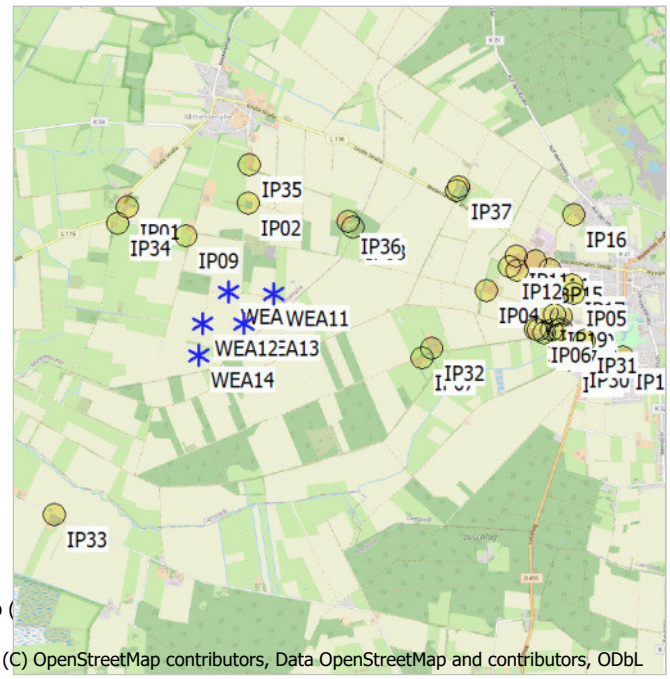
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

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)...

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

		astron. max. mögl. Beschattungsdauer			**met. wahrsch. Beschattungsdauer**
Nr.	Name	Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
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

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.

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)

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)

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

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

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

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

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
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	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)

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)

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)

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

SHADOW - Kalender

Berechnung: 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)

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

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
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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
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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
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	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
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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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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
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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
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	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
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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
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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
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	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
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	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)

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
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	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
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	16:32	17:31	18:25	20:22	21:16	21:55	21:48	20:57	19:45	18:32	16:30	16:04
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	16:33	17:33	18:27	20:24	21:18	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
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	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
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	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
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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)

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
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	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
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	16:16	17:09	18:04	20:02	20:57	21:45	21:57	21:19	20:12	18:58	16:49	16:08
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	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
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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
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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
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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
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	16:53	17:54	18:47	20:44	21:35	21:58	21:32	20:30	19:15	17:05	16:14	16:08
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	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
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	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)

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
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	16:20	17:15	18:10	20:07	21:02	21:48	21:55	21:13	20:04	18:51	16:43	16:06
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	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
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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
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	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
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	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
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	16:55	17:56	18:49	20:46	21:36	21:58	21:31	20:28	19:13	17:03	16:13	16:09
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	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
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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)

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
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	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
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	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
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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
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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
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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
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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
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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
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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
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	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
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	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)

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

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

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
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	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
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	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)

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

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
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	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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	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)

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
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	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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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
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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
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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)

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]

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Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
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29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
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Red.Sonnenscheinwahrsch.												
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Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

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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
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Betriebsdauer je Sektor

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	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
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	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
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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)

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
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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
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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
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	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
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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
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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
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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
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	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
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	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)

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
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	16:24	17:21	18:15	20:13	21:07	21:51	21:53	21:07	19:57	18:44	16:38	16:05
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	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
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	16:33	17:33	18:27	20:24	21:17	21:55	21:47	20:55	19:42	18:30	16:28	16:04
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	16:35	17:35	18:29	20:26	21:19	21:56	21:46	20:53	19:40	18:27	16:26	16:04
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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
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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
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	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
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	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)

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
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	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
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	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
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	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
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	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
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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
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	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
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	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)

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
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	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
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	16:16	17:09	18:04	20:02	20:57	21:45	21:56	21:19	20:12	18:58	16:49	16:08
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	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
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	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
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	16:44	17:44	18:38	20:35	21:27	21:58	21:40	20:42	19:28	18:16	16:19	16:05
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	16:48	17:48	18:42	20:38	21:30	21:58	21:37	20:37	19:23	18:12	16:17	16:06
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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
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29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
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	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)

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
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	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
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	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
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29	08:16		07:07	05:55	05:05	04:57	05:33	06:26	07:21	07:16	08:13	08:41
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	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)

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
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	16:15	17:07	18:02	20:00	20:55	21:44	21:57	21:21	20:14	19:01	16:51	16:08
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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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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
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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
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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
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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
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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)

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
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	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
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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
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	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)

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

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
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	16:34	17:33	18:27	20:24	21:18	21:56	21:47	20:55	19:43	18:30	16:28	16:04
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	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)

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)

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

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)

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

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)

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
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	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												

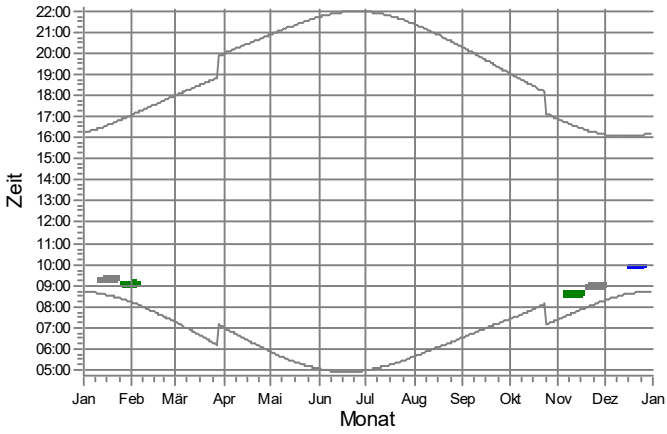
Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

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

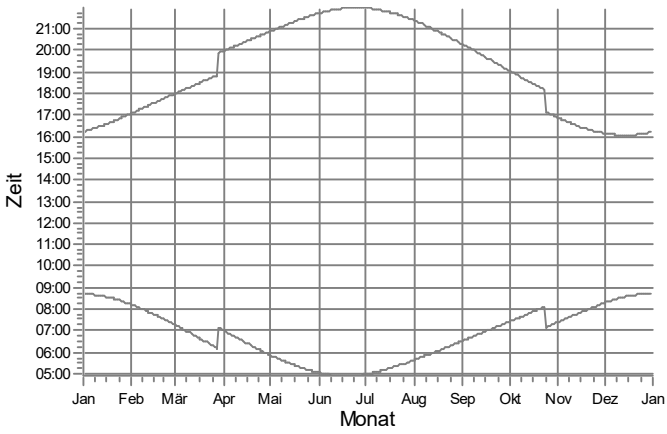
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

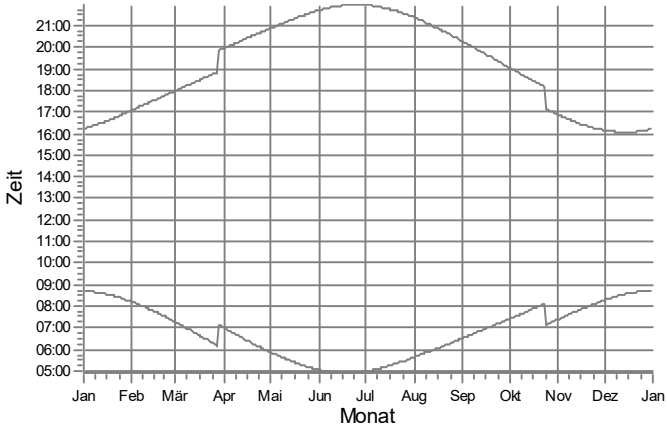
IP01: Sticht 1, 21770 Mittelstenahe



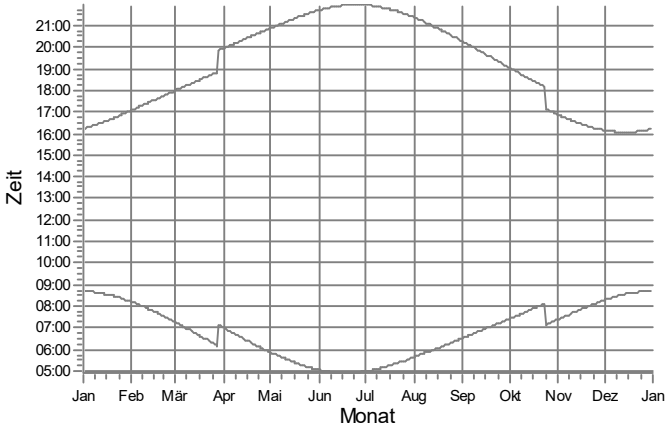
IP02: Neues Moor 21, 21770 Mittelstenahe



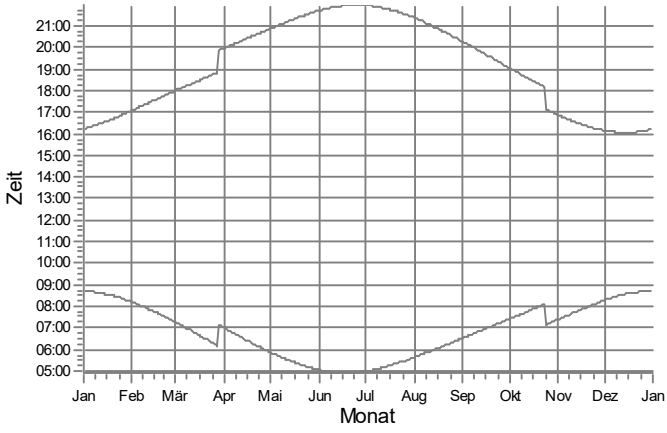
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



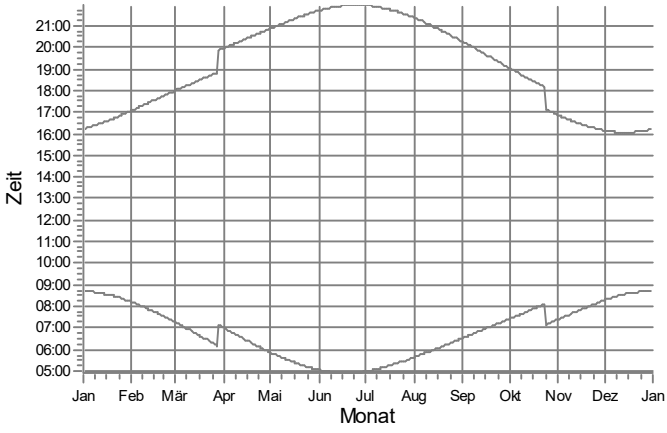
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuw eg 5, 21769 Lamstedt



WEA

WEA10: E-70 E4 (M2)

WEA12: E-70 E4 (M5)

WEA13: E-70 E4 (M6)

Lizenzierter Anwender:
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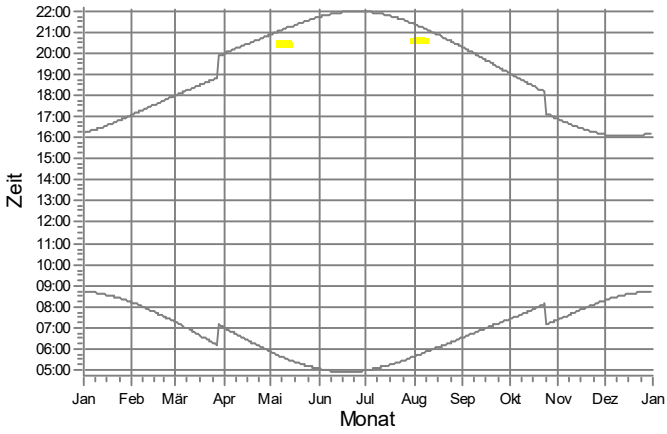
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

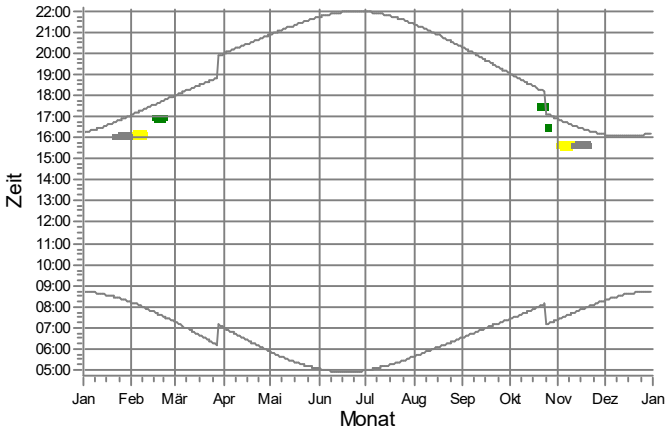
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

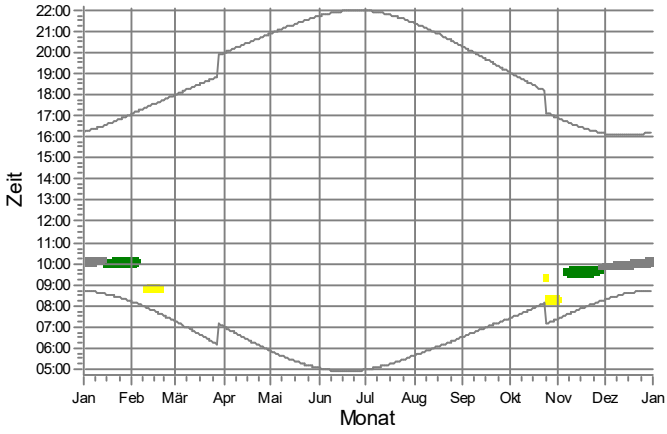
IP07: Driftw eg 2, 21769 Lamstedt



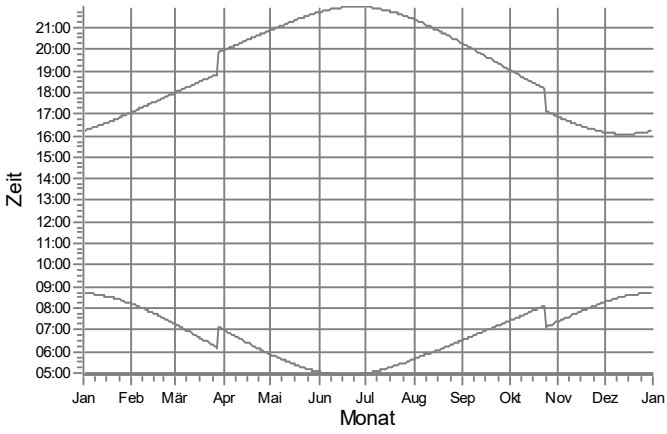
IP08: Hanew orth 1, 21770 Lamstedt



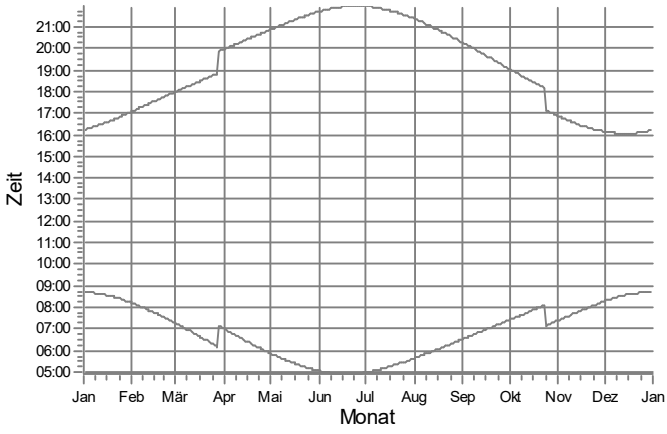
IP09: Sticht 5, 21770 Mittelstenahe



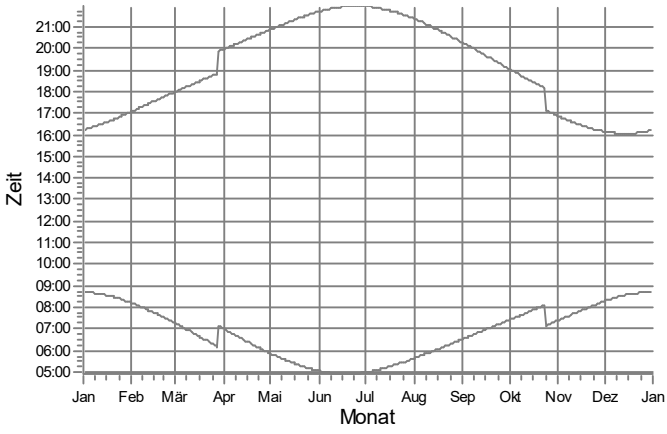
IP10: Falkenhorst 1, 21769 Lamstedt



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)

Lizenzierter Anwender:
windtest grevenbroich gmbh
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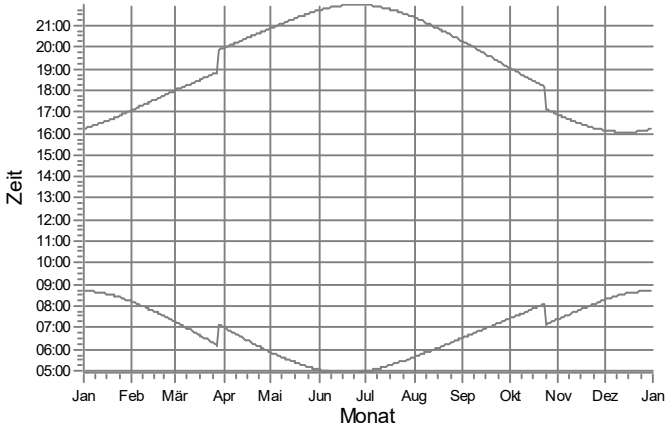
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:27/4.0.540

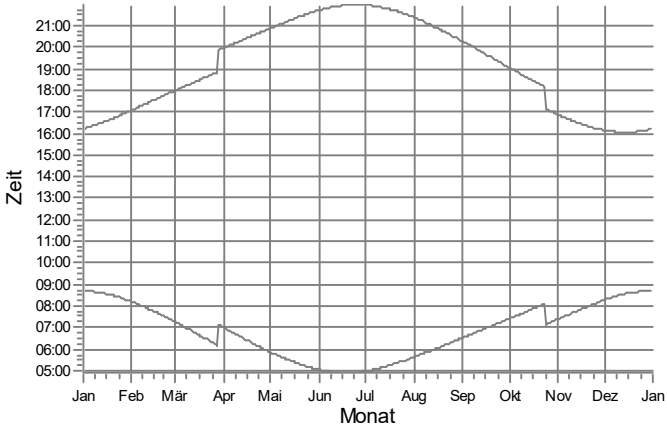
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

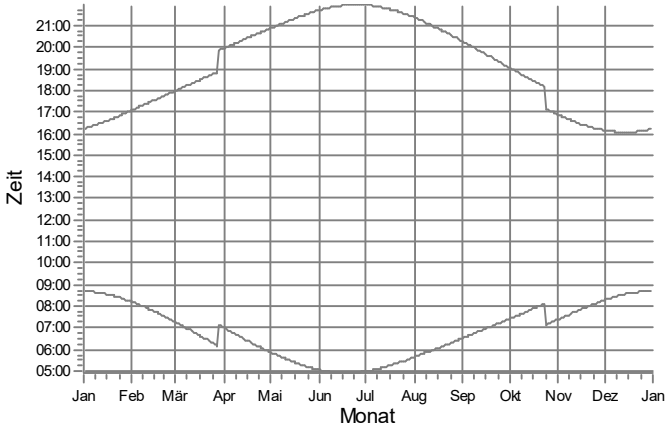
IP13: Auf dem Kampen 5, 21769 Lamstedt



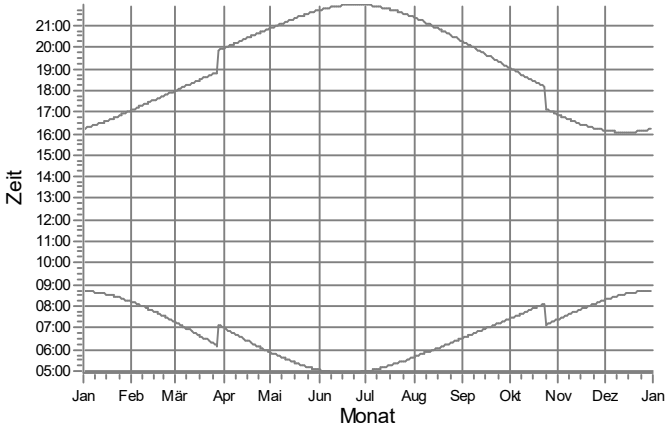
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



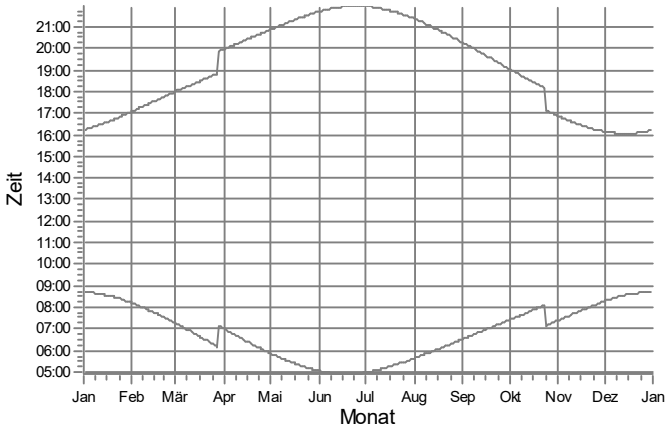
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



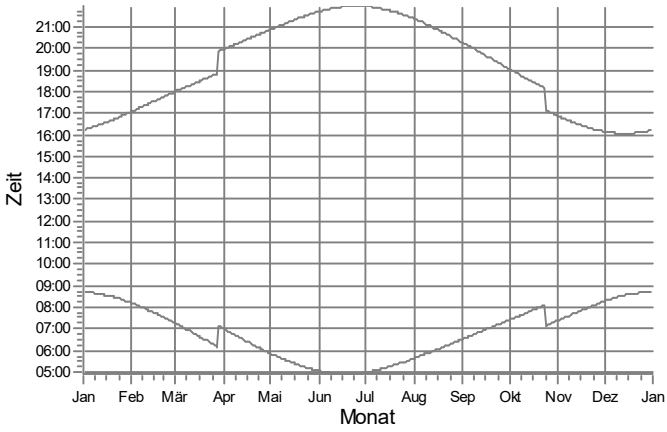
IP16: Kleiner Köven 15A, 21769 Lamstedt



IP17: An der Gösche 10, 21769 Lamstedt



IP18: Wischhofstraße 17a, 21769 Lamstedt

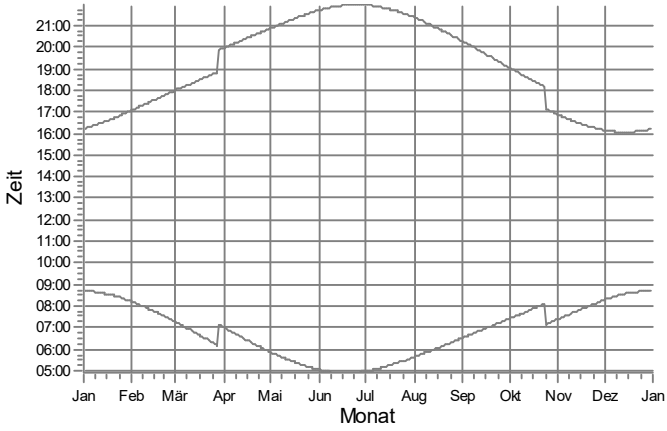


WEA

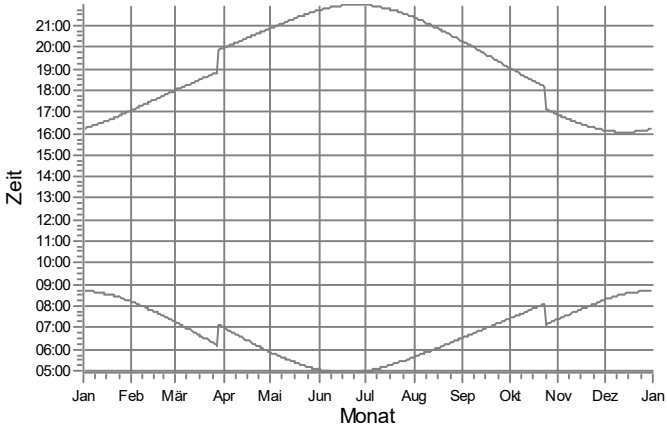
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

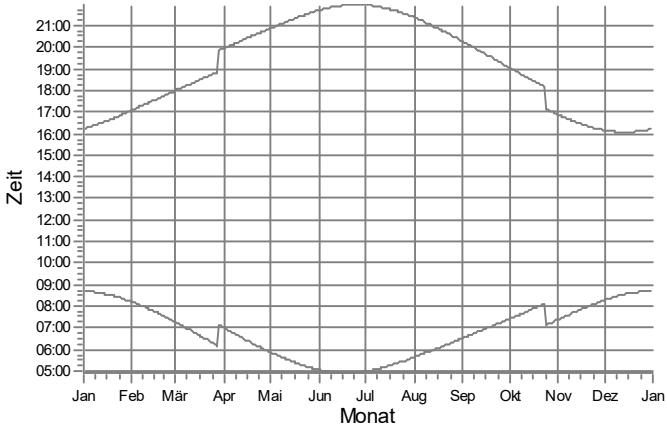
IP19: Wischhofstraße 15, 21769 Lamstedt



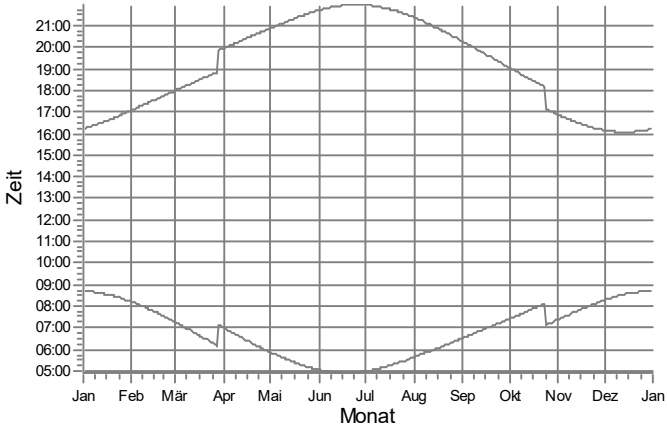
IP20: Wischhofstraße 13, 21769 Lamstedt



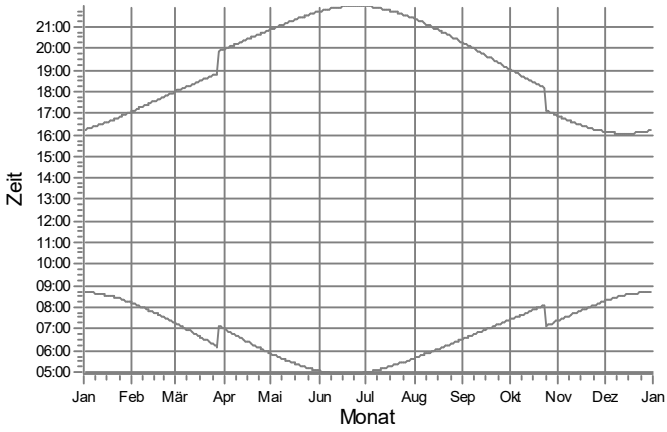
IP21: Auf der Stroth 18, 21769 Lamstedt



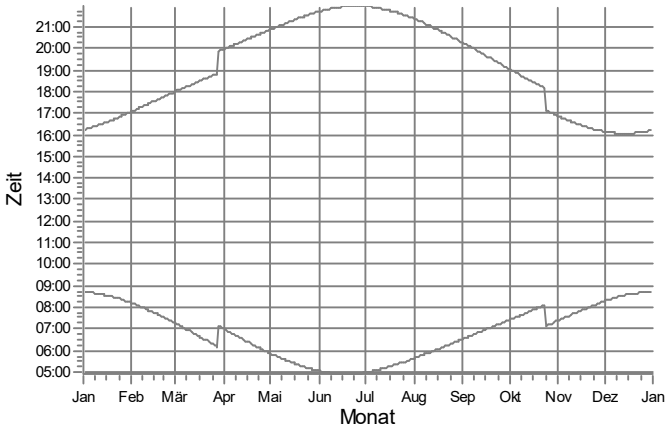
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt

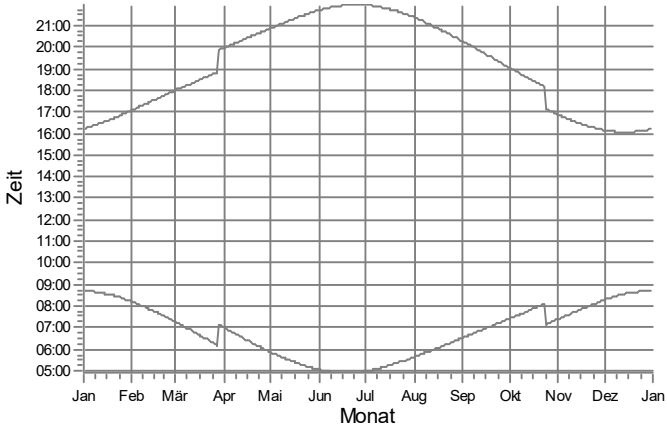


WEA

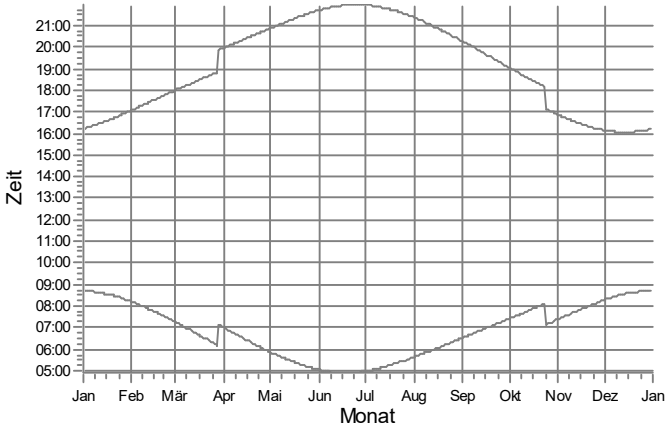
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

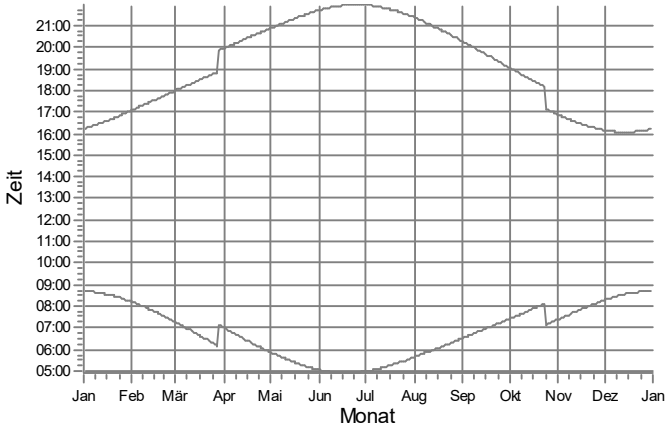
IP25: Auf der Stroth 21, 21769 Lamstedt



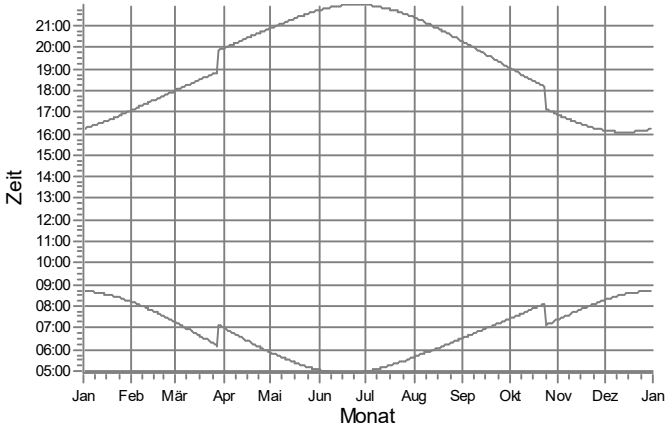
IP26: Auf der Stroth 25, 21769 Lamstedt



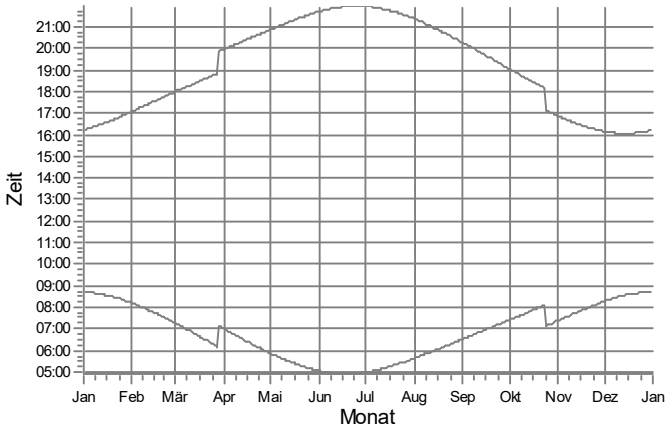
IP27: Strother Heuw eg 1, 21769 Lamstedt



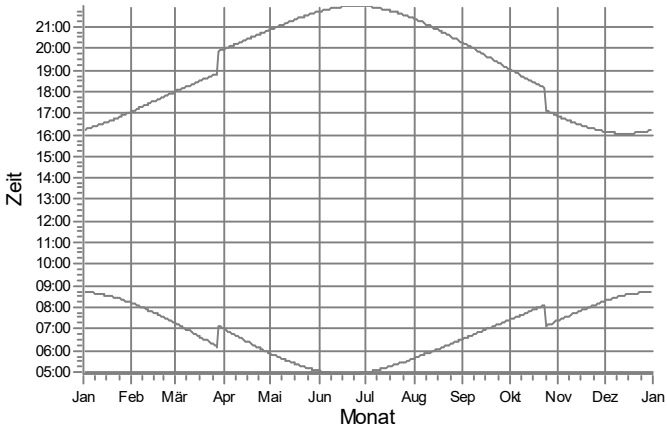
IP28: Strother Heuw eg 9, 21769 Lamstedt



IP29: Birkenw eg 11, 21769 Lamstedt



IP30: Pappelw eg 7, 21769 Lamstedt

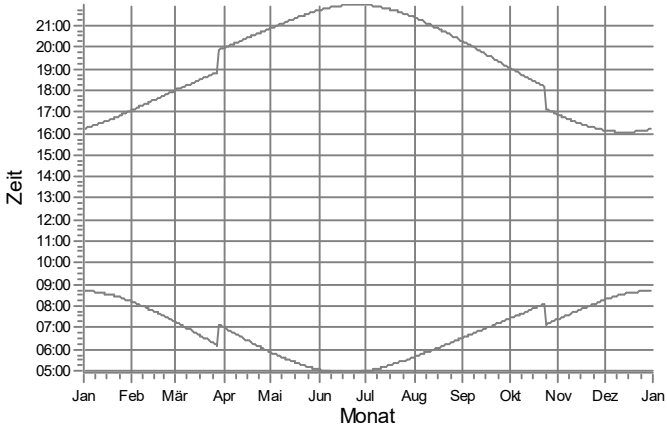


WEA

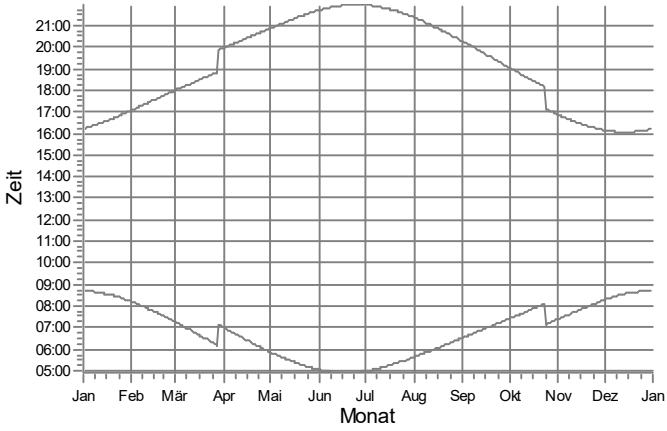
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

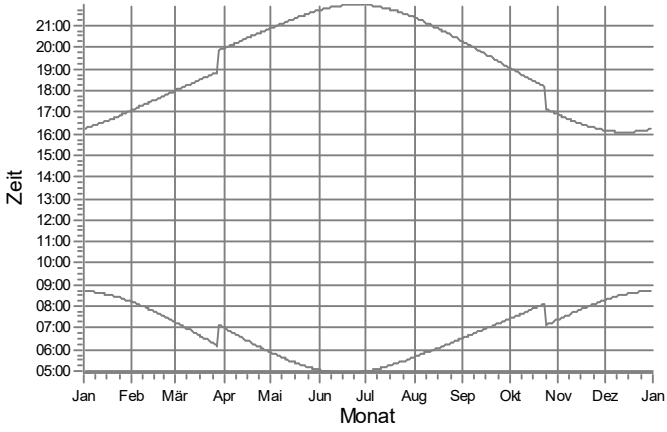
IP31: Jochensw eg 8, 21769 Lamstedt



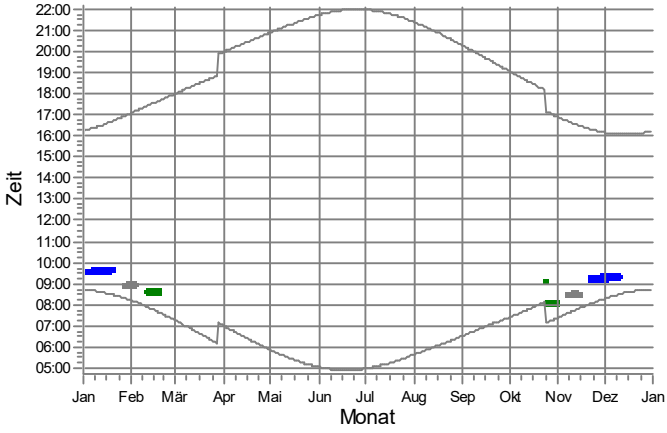
IP32: Driftw eg 1, 21769 Lamstedt



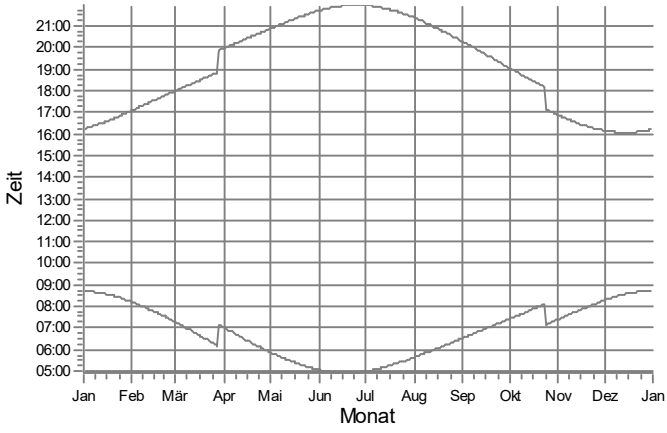
IP33: Horn 23, 21769 Armstorf



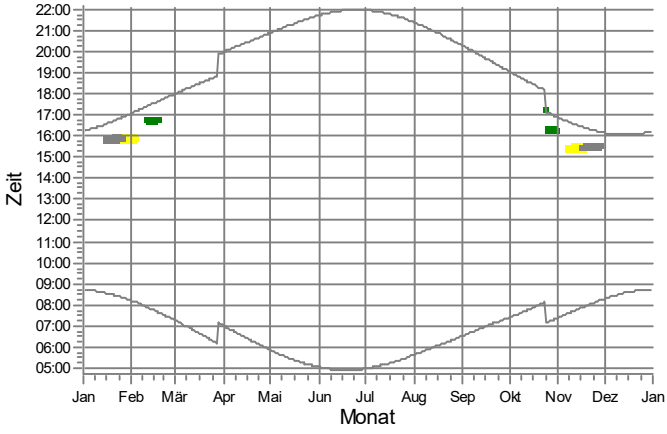
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Hanew orth 2, 21770 Lamstedt



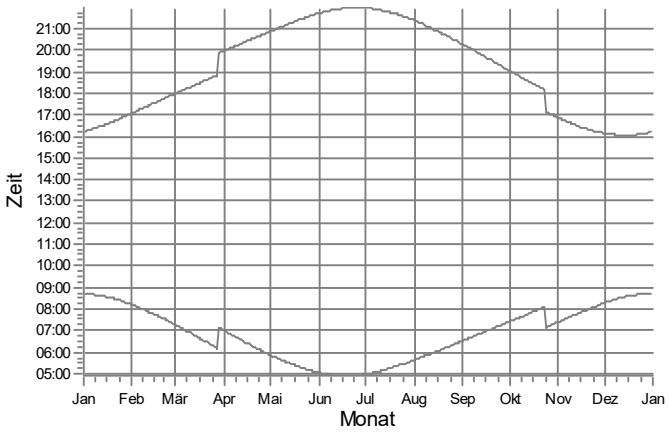
WEA

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

SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Vorbelastung

IP37: Mittelstenaher Str. 32, 21769 Lamstedt



WEA

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

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

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

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

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	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 09:14-09:24/10
	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 09:14-09:23/9
	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	07:09	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

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

SHADOW - Kalender pro WEA

Berechnung: 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

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

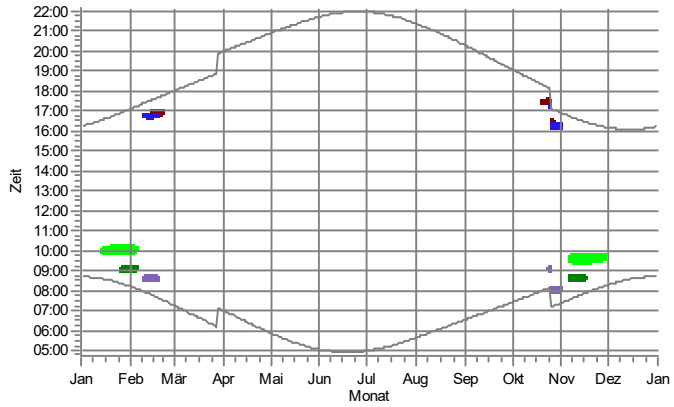
Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

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

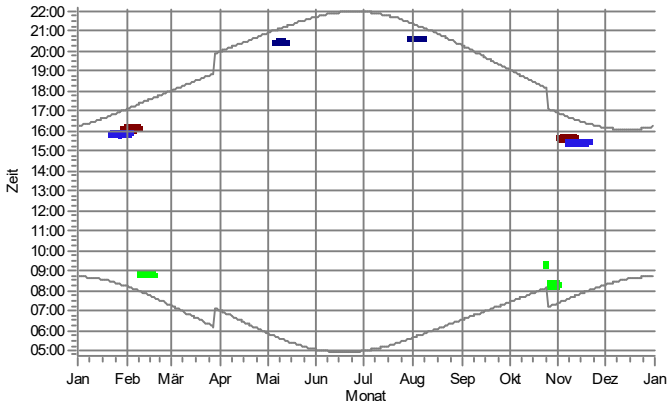
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Vorbelastung

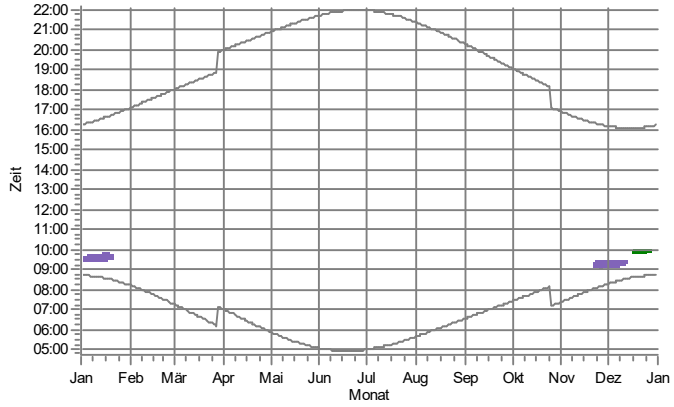
WEA10: E-70 E4 (M2)



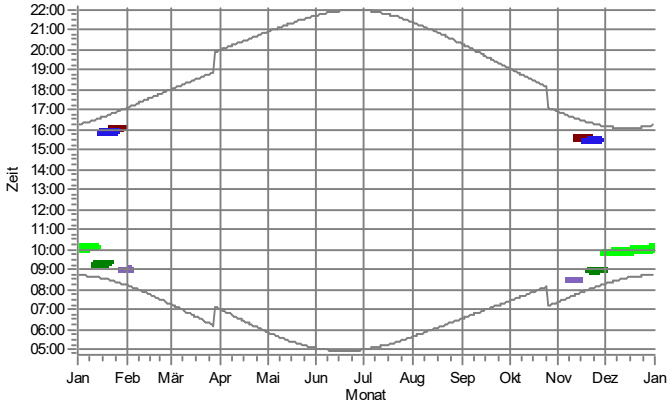
WEA11: E-70 E4 (M3)



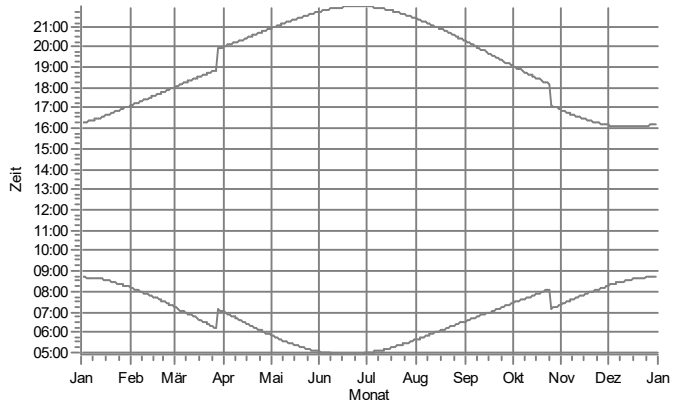
WEA12: E-70 E4 (M5)



WEA13: E-70 E4 (M6)



WEA14: E-70 E4 (M8)



Schattenrezeptoren

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

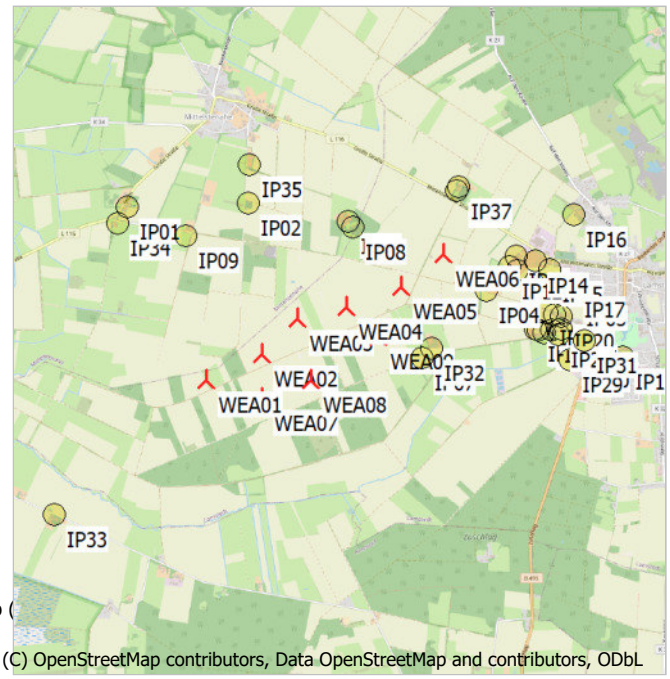
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

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	Schattendaten NH	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)...

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

		astron. max. mögl. Beschattungsdauer			met. wahrsch. Beschattungsdauer
Nr.	Name	Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
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)...

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.

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

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)

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)

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)

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

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)

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

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)

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

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		05:51		05:02	
	16:14		17:05		18:00		19:58	19:00 (WEA09)	20:53	19:51 (WEA05)	21:43	
2	08:41		08:10		07:12		06:57	19	05:49	28	05:01	
	16:15		17:07		18:02		20:00	19:02 (WEA09)	20:55	20:19 (WEA05)	21:44	
3	08:41		08:08		07:10		06:55	15	05:47	27	05:00	
	16:16		17:09		18:04		20:02	19:17 (WEA09)	20:57	19:51 (WEA05)	21:45	
4	08:41		08:06		07:07		06:52	10	05:45	27	04:59	
	16:17		17:11		18:06		20:04	19:14 (WEA09)	20:58	20:18 (WEA05)	21:46	
5	08:40		08:04		07:05		06:50		05:43	25	04:59	
	16:19		17:13		18:08		20:05		21:00	19:52 (WEA05)	21:47	
6	08:40		08:03		07:03		06:48		05:41	24	04:58	
	16:20		17:15		18:10		20:07		21:02	20:16 (WEA05)	21:48	
7	08:40		08:01		07:00		06:45		05:39	22	04:57	
	16:21		17:17		18:12		20:09		21:04	19:53 (WEA05)	21:49	
8	08:39		07:59		06:58		06:43		05:37	21	04:57	
	16:23		17:19		18:14		20:11		21:05	19:55 (WEA05)	21:50	
9	08:38		07:57		06:56		06:40		05:35	18	04:56	
	16:24		17:21		18:15		20:13		21:07	19:57 (WEA05)	21:51	
10	08:38		07:55		06:53		06:38		05:33	14	04:56	
	16:26		17:23		18:17		20:15		21:09	19:59 (WEA05)	21:52	
11	08:37		07:53		06:51		06:36		05:32	9	04:55	
	16:27		17:25		18:19		20:16		21:11	20:08 (WEA05)	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		24

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)

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

SHADOW - Kalender

Berechnung: 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	
	16:14		17:05		18:00		19:58	23	19:31 (WEA02)	32	20:19 (WEA03)	99
2	08:41		08:10		07:12		06:57		19:09 (WEA02)		05:49	
	16:15		17:07		18:02	3	17:35 (WEA07)	24	19:33 (WEA02)	31	20:18 (WEA03)	100
3	08:41		08:08		07:10		17:30 (WEA07)		19:08 (WEA02)		05:47	
	16:16		17:09		18:04	7	17:37 (WEA07)	24	19:32 (WEA02)	31	20:18 (WEA03)	101
4	08:41		08:06		07:07		17:29 (WEA07)		19:09 (WEA02)		05:45	
	16:17		17:11		18:06	10	17:39 (WEA07)	23	19:32 (WEA02)	30	20:17 (WEA03)	102
5	08:40		08:05		07:05		17:27 (WEA07)		19:09 (WEA02)		05:43	
	16:19		17:13		18:08	14	17:41 (WEA07)	22	19:31 (WEA02)	29	20:17 (WEA03)	104
6	08:40		08:03		07:03		17:27 (WEA07)		19:09 (WEA02)		05:41	
	16:20		17:15		18:10	16	17:43 (WEA07)	21	19:30 (WEA02)	28	20:16 (WEA03)	104
7	08:40		08:01		07:00		17:26 (WEA07)		19:11 (WEA02)		05:39	
	16:21		17:17		18:12	18	17:44 (WEA07)	17	19:28 (WEA02)	27	20:15 (WEA03)	105
8	08:39		07:59		06:58		17:26 (WEA07)		19:13 (WEA02)		05:37	
	16:23		17:19		18:14	21	17:47 (WEA07)	13	19:26 (WEA02)	25	20:15 (WEA03)	105
9	08:38		07:57		06:56		17:26 (WEA07)		19:15 (WEA02)		05:35	
	16:24		17:21		18:15	23	17:49 (WEA07)	7	19:22 (WEA02)	25	20:15 (WEA09)	106
10	08:38		07:55		06:53		17:25 (WEA07)				05:34	
	16:26		17:23		18:17	26	17:51 (WEA08)			28	20:19 (WEA09)	105
11	08:37		07:53		06:51		17:26 (WEA07)				05:32	
	16:27		17:25		18:19	27	17:53 (WEA08)			32	20:23 (WEA09)	106
12	08:36		07:51		06:48		17:26 (WEA07)				05:30	
	16:29		17:27		18:21	28	17:54 (WEA08)			37	20:25 (WEA09)	107
13	08:36		07:49		06:46		17:25 (WEA08)				05:28	
	16:30		17:29		18:23	32	17:57 (WEA08)			42	20:27 (WEA09)	106
14	08:35		07:47		06:44		17:24 (WEA08)				05:26	
	16:32		17:31		18:25	34	17:58 (WEA08)			45	20:29 (WEA09)	107
15	08:34		07:45		06:41		17:24 (WEA08)				05:25	
	16:34		17:33		18:27	34	17:58 (WEA08)			48	20:30 (WEA09)	107
16	08:33		07:43		06:39		17:23 (WEA08)				05:23	
	16:35		17:35		18:29	35	17:58 (WEA08)			51	20:32 (WEA09)	108
17	08:32		07:41		06:36		17:23 (WEA08)				05:21	
	16:37		17:37		18:31	35	17:58 (WEA08)			54	20:33 (WEA09)	107
18	08:31		07:39		06:34		17:23 (WEA08)				05:20	
	16:39		17:39		18:32	35	17:58 (WEA08)			57	20:35 (WEA09)	107
19	08:30		07:37		06:32		17:23 (WEA08)		19:59 (WEA03)		05:18	
	16:40		17:41		18:34	34	17:57 (WEA08)	4	20:03 (WEA03)	59	20:36 (WEA09)	107
20	08:29		07:35		06:29		17:23 (WEA08)		19:56 (WEA03)		05:17	
	16:42		17:43		18:36	34	17:57 (WEA08)	8	20:04 (WEA03)	61	20:37 (WEA09)	108
21	08:27		07:32		06:27		17:23 (WEA08)		19:54 (WEA03)		05:15	
	16:44		17:45		18:38	33	17:56 (WEA08)	12	20:06 (WEA03)	63	20:38 (WEA09)	108
22	08:26		07:30		06:24		17:24 (WEA08)		19:52 (WEA03)		05:14	
	16:46		17:47		18:40	31	17:55 (WEA08)	16	20:08 (WEA03)	69	20:54 (WEA04)	108
23	08:25		07:28		06:22		17:24 (WEA08)		19:51 (WEA03)		05:13	
	16:48		17:49		18:42	29	17:53 (WEA08)	19	20:10 (WEA03)	79	20:57 (WEA04)	108
24	08:24		07:26		06:19		17:25 (WEA08)		19:50 (WEA03)		05:11	
	16:49		17:50		18:43	27	17:52 (WEA08)	22	20:12 (WEA03)	83	20:58 (WEA04)	107
25	08:22		07:24		06:17		17:26 (WEA08)		19:49 (WEA03)		05:10	
	16:51		17:52		18:45	25	18:19 (WEA02)	25	20:14 (WEA03)	88	21:00 (WEA04)	107
26	08:21		07:21		06:14		17:28 (WEA08)		19:49 (WEA03)		05:09	
	16:53		17:54		18:47	26	18:21 (WEA02)	26	20:15 (WEA03)	89	21:01 (WEA04)	107
27	08:19		07:19		06:12		17:30 (WEA08)		19:48 (WEA03)		05:07	
	16:55		17:56		18:49	24	18:22 (WEA02)	29	20:17 (WEA03)	91	21:02 (WEA04)	108
28	08:18		07:17		06:10		17:35 (WEA08)		19:48 (WEA03)		05:06	
	16:57		17:58		18:51	17	18:24 (WEA02)	31	20:19 (WEA03)	93	21:04 (WEA04)	107
29	08:16				07:07		19:11 (WEA02)		19:48 (WEA03)		05:05	
	16:59				19:53	16	19:27 (WEA02)	31	20:19 (WEA03)	95	21:05 (WEA04)	107
30	08:15				07:05		19:10 (WEA02)		19:47 (WEA03)		05:04	
	17:01				19:54	18	19:28 (WEA02)	32	20:19 (WEA03)	96	21:06 (WEA04)	106
31	08:13				07:02		19:09 (WEA02)				05:03	
	17:03				19:56	21	19:30 (WEA02)			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)

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)	07:28		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)	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	24	20:24 (WEA03)	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	25	20:24 (WEA03)	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	28	20:26 (WEA03)	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	28	20:25 (WEA03)	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	29	20:26 (WEA03)	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	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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

SHADOW - Kalender

Berechnung: 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)

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

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

SHADOW - Kalender

Berechnung: 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)

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)

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	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				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)

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)

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

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	16:06
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		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)

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		07:14		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			67			220			

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

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

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)

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		05:43	04:59
	16:19	17:13	18:08		20:05	7	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	13	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	17	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	21:06	21:50
9	08:38	07:57	06:56		06:40		05:35	04:56
	16:24	17:21	18:15		20:13	24	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	28	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	31	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	34	21:12	21:53
13	08:36	07:49	06:46		06:31		05:28	04:54
	16:30	17:29	18:23	4	17:57 (WEA05)	20:20	35	21:14	21:54
14	08:35	07:47	06:44		06:29		05:26	04:54
	16:32	17:31	18:25	8	17:58 (WEA05)	20:22	36	21:16	21:55
15	08:34	07:45	06:41		06:26		05:25	04:54
	16:33	17:33	18:27	11	18:00 (WEA05)	20:24	37	21:18	21:55
16	08:33	07:43	06:39		06:24		05:23	04:54
	16:35	17:35	18:29	15	18:02 (WEA05)	20:26	37	21:19	21:56
17	08:32	07:41	06:36		06:22		05:21	04:54
	16:37	17:37	18:30	17	18:04 (WEA05)	20:27	37	21:21	21:56
18	08:31	07:39	06:34		06:19		05:20	04:54
	16:39	17:39	18:32	20	18:05 (WEA05)	20:29	37	21:22	21:57
19	08:30	07:37	06:31		06:17		05:18	04:54
	16:40	17:41	18:34	23	18:08 (WEA05)	20:31	37	21:24	21:57
20	08:29	07:34	06:29		06:15		05:17	04:54
	16:42	17:43	18:36	25	18:10 (WEA05)	20:33	36	21:26	21:58
21	08:27	07:32	06:27		06:13		05:15	04:54
	16:44	17:44	18:38	27	18:11 (WEA05)	20:35	35	21:27	21:58
22	08:26	07:30	06:24		06:10		05:14	04:54
	16:46	17:46	18:40	26	18:11 (WEA05)	20:37	35	21:29	21:58
23	08:25	07:28	06:22		06:08		05:12	04:54
	16:48	17:48	18:42	24	18:09 (WEA05)	20:38	33	21:30	21:58
24	08:24	07:26	06:19		06:06		05:11	04:54
	16:49	17:50	18:43	24	18:09 (WEA05)	20:40	31	21:32	21:58
25	08:22	07:23	06:17		06:04		05:10	04:55
	16:51	17:52	18:45	21	18:07 (WEA05)	20:42	30	21:33	21:58
26	08:21	07:21	06:14		06:02		05:09	04:55
	16:53	17:54	18:47	19	18:06 (WEA05)	20:44	28	21:35	21:58
27	08:19	07:19	06:12		05:59		05:07	04:56
	16:55	17:56	18:49	15	18:03 (WEA05)	20:46	25	21:36	21:58
28	08:18	07:17	06:09		05:57		05:06	04:56
	16:57	17:58	18:51	9	18:00 (WEA05)	20:48	22	21:37	21:58
29	08:16		07:07		05:55		05:05	04:57
	16:59		19:53		20:49	18	21:39	21:58
30	08:15		07:05		05:53		05:04	04:57
	17:01		19:54		20:51	12	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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	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			0,21				
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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

SHADOW - Kalender

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

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

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

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)

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

SHADOW - Kalender

Berechnung: 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)

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

SHADOW - Kalender

Berechnung: 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)

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

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)

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

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)

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		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 (WEA06)
6	08:40		08:03		07:03		06:48			05:41			04:58		20:54 (WEA06)
	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 (WEA06)
	16:44		17:44		18:38	5 18:11 (WEA09)	20:35	15	20:06 (WEA05)	21:27			21:58	27	21:22 (WEA06)
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			0,22	
Met.wahrsch.Beschattung						31		61			28			154	

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

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

SHADOW - Kalender

Berechnung: 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)

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

SHADOW - Kalender

Berechnung: 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)

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

SHADOW - Kalender

Berechnung: 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)

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

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

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			05:02		
	16:14		17:05		18:00		19:58			20:53	21	19:53 (WEA05) / 20:14 (WEA05)	21:43	15	20:53 (WEA06) / 21:08 (WEA06)
2	08:41		08:10		07:12		06:57			05:49			05:01		
	16:15		17:07		18:02		20:00			20:55	19	19:54 (WEA05) / 20:13 (WEA05)	21:44	16	20:54 (WEA06) / 21:10 (WEA06)
3	08:41		08:08		07:10		06:55			05:47			05:00		
	16:16		17:09		18:04		20:02			20:57	16	19:55 (WEA05) / 20:11 (WEA05)	21:45	18	20:53 (WEA06) / 21:11 (WEA06)
4	08:41		08:06		07:07		06:52			05:45			04:59		
	16:17		17:11		18:06		20:04			20:58	12	19:57 (WEA05) / 20:09 (WEA05)	21:46	18	20:53 (WEA06) / 21:11 (WEA06)
5	08:40		08:04		07:05		06:50			05:43			04:59		
	16:19		17:13		18:08		20:05			21:00	7	19:59 (WEA05) / 20:06 (WEA05)	21:47	20	20:53 (WEA06) / 21:13 (WEA06)
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	20	20:53 (WEA06) / 21:13 (WEA06)
7	08:39		08:01		07:00		06:45			05:39			04:57		
	16:21		17:17		18:12		20:09			21:04			21:49	22	20:52 (WEA06) / 21:14 (WEA06)
8	08:39		07:59		06:58		06:43			05:37			04:57		
	16:23		17:19		18:14		20:11			21:05			21:50	22	20:53 (WEA06) / 21:15 (WEA06)
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	23	20:53 (WEA06) / 21:16 (WEA06)
10	08:38		07:55		06:53		06:38			05:33			04:56		
	16:26		17:23		18:17		20:15			21:09			21:52	24	20:52 (WEA06) / 21:16 (WEA06)
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	24	20:53 (WEA06) / 21:17 (WEA06)
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	25	20:53 (WEA06) / 21:18 (WEA06)
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	25	20:53 (WEA06) / 21:18 (WEA06)
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	26	20:53 (WEA06) / 21:19 (WEA06)
15	08:34		07:45		06:41		06:26			05:25			04:54		
	16:33		17:33		18:27		20:24			21:17			21:55	27	20:53 (WEA06) / 21:20 (WEA06)
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	27	20:53 (WEA06) / 21:20 (WEA06)
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	27	20:54 (WEA06) / 21:21 (WEA06)
18	08:31		07:39		06:34		06:19		19:59 (WEA05)	05:20			04:54		
	16:39		17:39		18:32		20:29	3	20:02 (WEA05)	21:22			21:57	27	20:54 (WEA06) / 21:21 (WEA06)
19	08:30		07:37		06:31		06:17		19:56 (WEA05)	05:18			04:54		
	16:40		17:41		18:34		20:31	7	20:03 (WEA05)	21:24			21:57	27	20:54 (WEA06) / 21:21 (WEA06)
20	08:29		07:34		06:29		06:15		19:55 (WEA05)	05:17			04:54		
	16:42		17:43		18:36		20:33	9	20:04 (WEA05)	21:26			21:58	28	20:54 (WEA06) / 21:22 (WEA06)
21	08:27		07:32		06:27		06:13		19:54 (WEA05)	05:15			04:54		
	16:44		17:44		18:38		20:35	12	20:06 (WEA05)	21:27			21:58	28	20:54 (WEA06) / 21:22 (WEA06)
22	08:26		07:30		06:24		06:10		19:53 (WEA05)	05:14			04:54		
	16:46		17:46		18:40		20:37	15	20:08 (WEA05)	21:29			21:58	28	20:55 (WEA06) / 21:23 (WEA06)
23	08:25		07:28		06:22		06:08		19:53 (WEA05)	05:12			04:54		
	16:48		17:48		18:42		20:38	17	20:10 (WEA05)	21:30			21:58	27	20:55 (WEA06) / 21:22 (WEA06)
24	08:24		07:26		06:19		06:06		19:52 (WEA05)	05:11			04:54		
	16:49		17:50		18:43		20:40	20	20:12 (WEA05)	21:32			21:58	27	20:55 (WEA06) / 21:22 (WEA06)
25	08:22		07:23		06:17		06:04		19:52 (WEA05)	05:10			04:55		
	16:51		17:52		18:45		20:42	22	20:14 (WEA05)	21:33			21:58	27	20:56 (WEA06) / 21:23 (WEA06)
26	08:21		07:21		06:14		06:02		19:51 (WEA05)	05:09		20:58 (WEA06)	04:55		
	16:53		17:54		18:47		20:44	23	20:14 (WEA05)	21:35	3	21:01 (WEA06)	21:58	27	20:55 (WEA06) / 21:22 (WEA06)
27	08:19		07:19		06:12		05:59		19:51 (WEA05)	05:07		20:57 (WEA06)	04:56		
	16:55		17:56		18:49		20:46	25	20:16 (WEA05)	21:36	5	21:02 (WEA06)	21:58	27	20:56 (WEA06) / 21:23 (WEA06)
28	08:18		07:17		06:09		05:57		19:51 (WEA05)	05:06		20:56 (WEA06)	04:56		
	16:57		17:58		18:51		20:48	24	20:15 (WEA05)	21:37	8	21:04 (WEA06)	21:58	26	20:56 (WEA06) / 21:22 (WEA06)
29	08:16				07:07		05:55		19:51 (WEA05)	05:05		20:55 (WEA06)	04:57		
	16:59				19:53		20:49	24	20:15 (WEA05)	21:39	10	21:05 (WEA06)	21:58	26	20:57 (WEA06) / 21:23 (WEA06)
30	08:15				07:05		05:53		19:52 (WEA05)	05:04		20:55 (WEA06)	04:57		
	17:01				19:54		20:51	22	20:14 (WEA05)	21:40	11	21:06 (WEA06)	21:58	26	20:56 (WEA06) / 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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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

SHADOW - Kalender

Berechnung: 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)

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		05:51		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		05:49		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		05:47		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		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		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		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		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		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		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		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		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 (WEA06)
	16:44		17:45		18:38	9 18:11 (WEA09)	20:35	10 20:06 (WEA05)	21:27		21:58	1 21:22 (WEA06)
22	08:26		07:30		06:24	18:01 (WEA09)	06:10	19:55 (WEA05)	05:14		04:54	21:22 (WEA06)
	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		58		60		1

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)

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)

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

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		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)

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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	21:12 (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	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)	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			0,63			0,62	
Gesamte Reduktion						0,17			0,22			0,25			0,23	
Met.wahrsch.Beschattung						110			240			828			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)

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)

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

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	07:09	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

SHADOW - Kalender

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

SHADOW - Kalender

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

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			07:22			08:17		
	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 (WEA05)
	21:56		21:15		20:07			18:53	41	08:51 (WEA06)	16:45	35	09:43 (WEA05)	16:06	92	14:48 (WEA02)
6	05:02		05:46		06:40			07:33		08:10 (WEA06)	07:32		09:06 (WEA05)	08:24		09:10 (WEA05)
	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 (WEA05)
	21:40		20:42		19:28			18:16			16:20	50	09:53 (WEA05)	16:05	127	15:02 (WEA02)
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)

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	

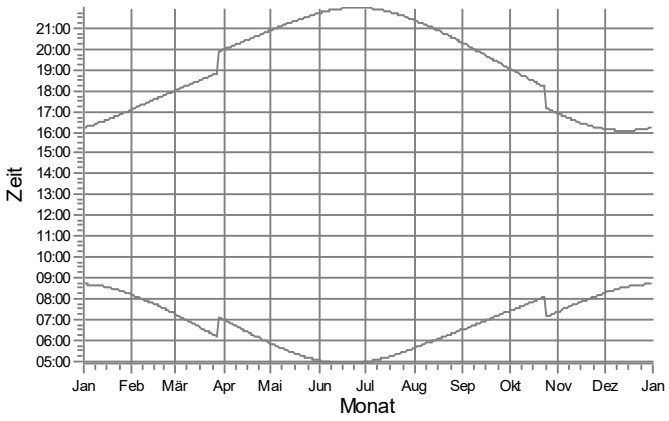
Tabellen-Layout: Die Daten für jeden Tag sind in folgender Matrix wiedergegeben (Sommerzeit wie Bezugsjahr):

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

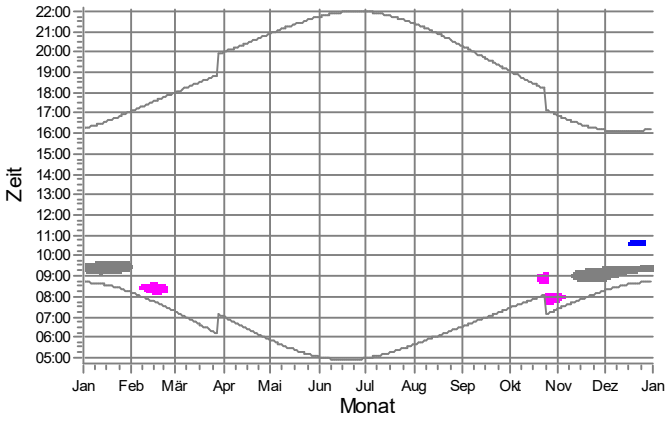
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

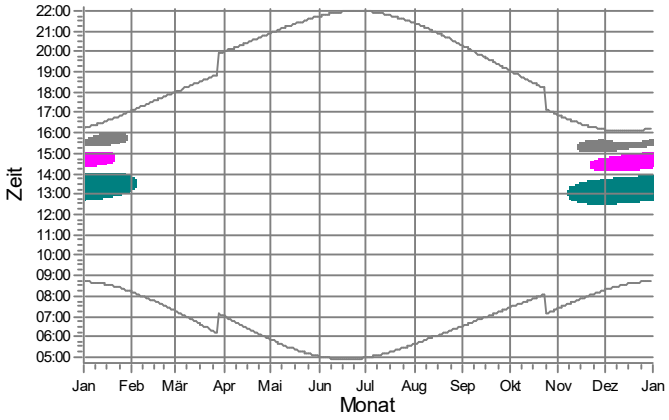
IP01: Sticht 1, 21770 Mittelstenahe



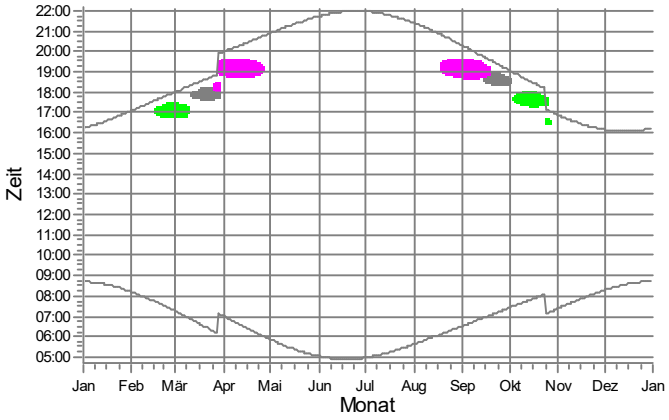
IP02: Neues Moor 21, 21770 Mittelstenahe



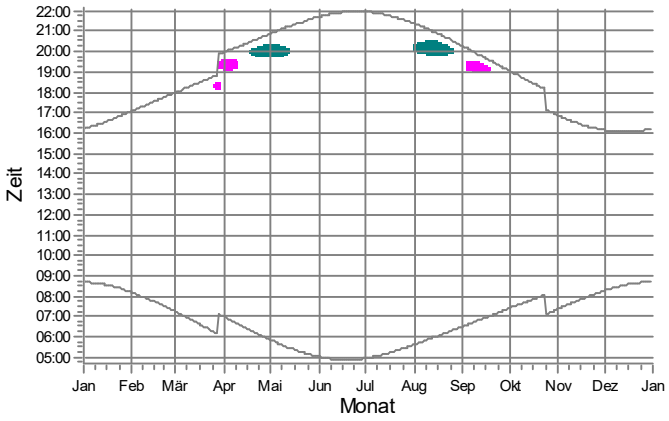
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



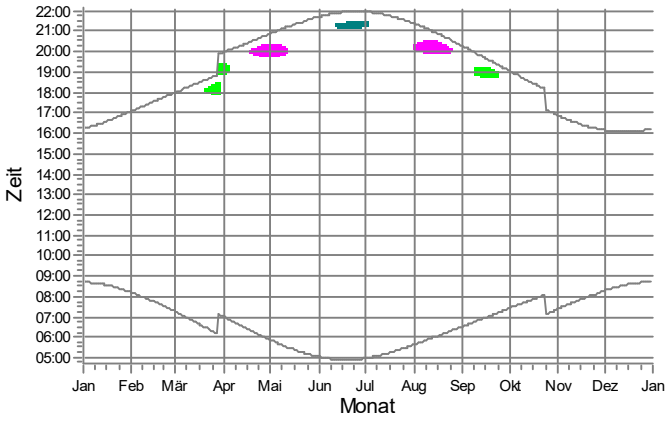
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuw eg 5, 21769 Lamstedt



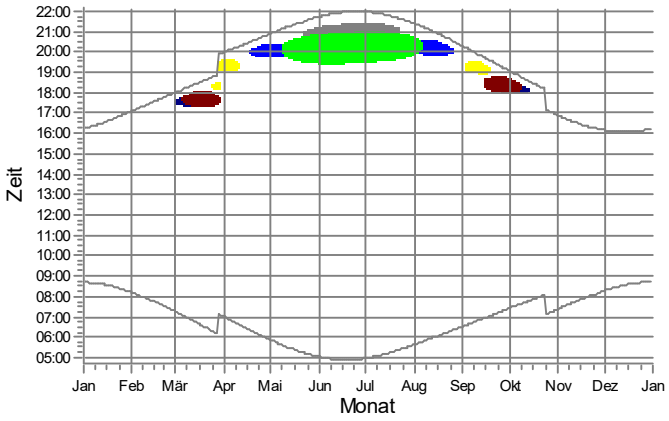
WEA

WEA03: E-175 EP5
WEA04: E-175 EP5
WEA05: E-175 EP5
WEA06: E-175 EP5
WEA09: E-175 EP5

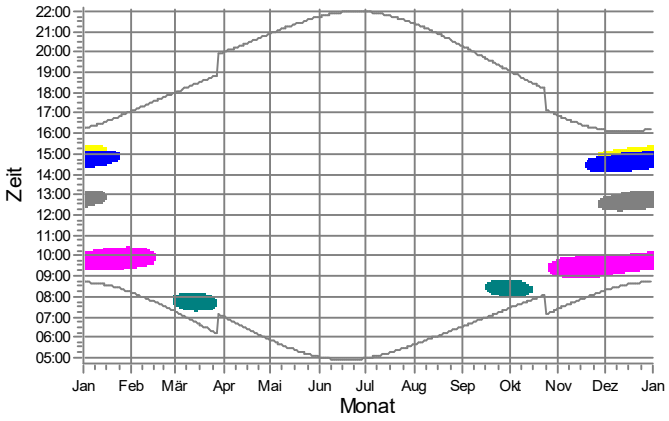
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

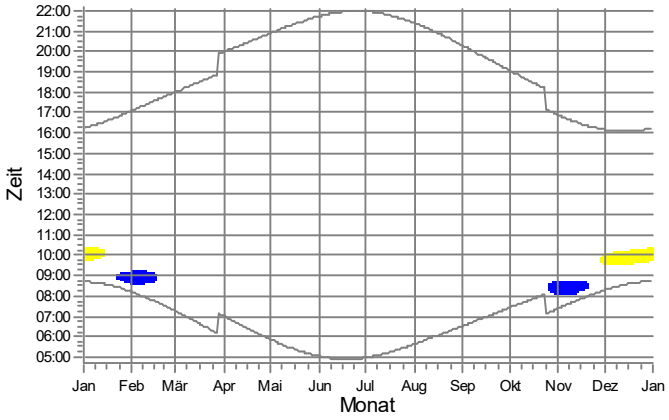
IP07: Driftw eg 2, 21769 Lamstedt



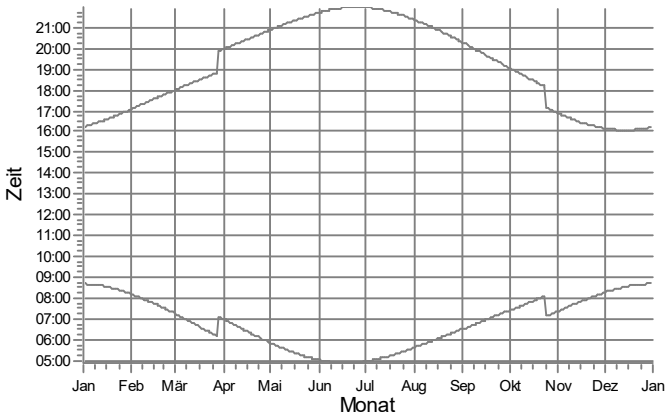
IP08: Hanew orth 1, 21770 Lamstedt



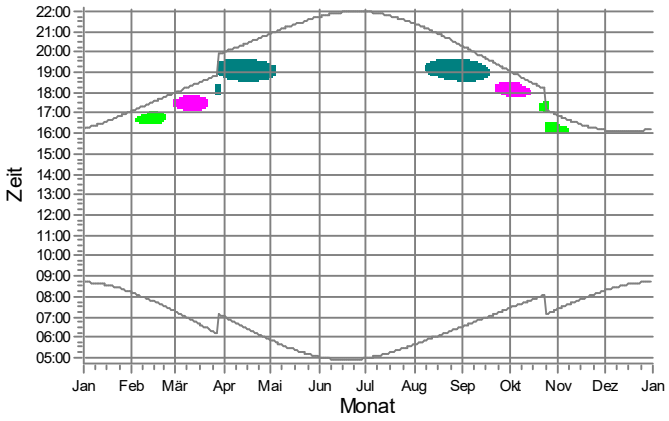
IP09: Sticht 5, 21770 Mittelstenahe



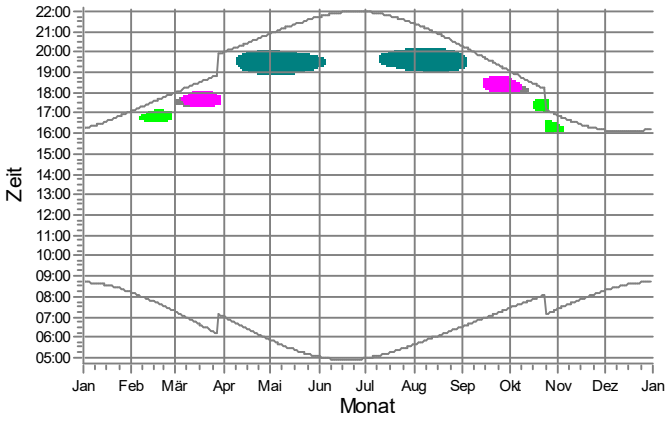
IP10: Falkenhorst 1, 21769 Lamstedt



IP11: Auf dem Kampen 2, 21769 Lamstedt



IP12: Auf dem Kampen 6, 21769 Lamstedt



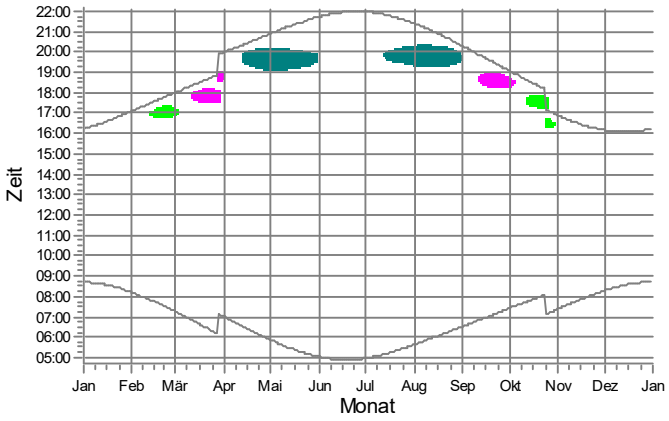
WEA

WEA02: E-175 EP5	WEA05: E-175 EP5	WEA08: E-175 EP5
WEA03: E-175 EP5	WEA06: E-175 EP5	WEA09: E-175 EP5
WEA04: E-175 EP5	WEA07: E-175 EP5	

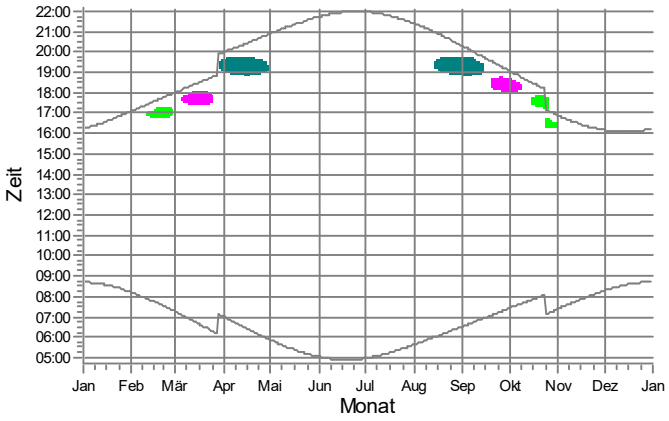
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

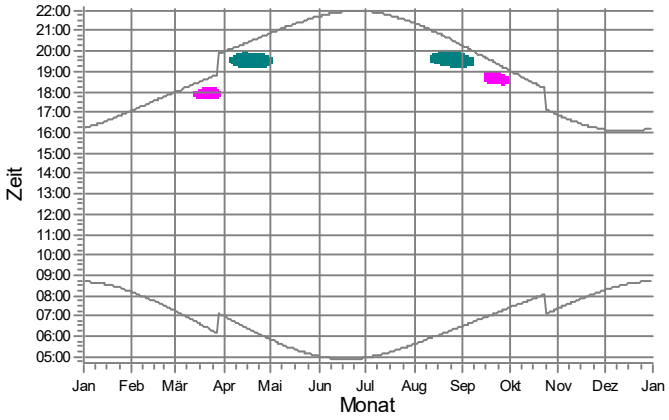
IP13: Auf dem Kampen 5, 21769 Lamstedt



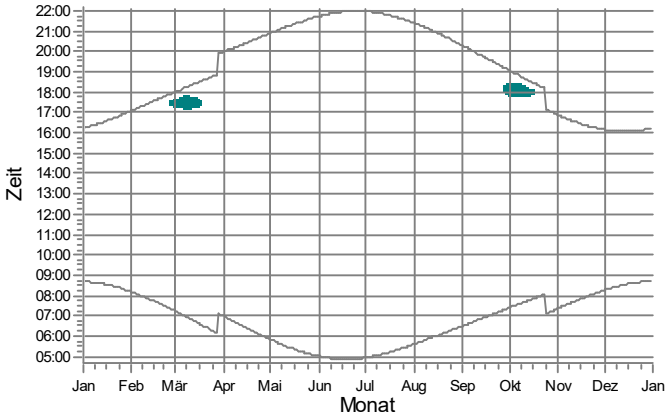
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



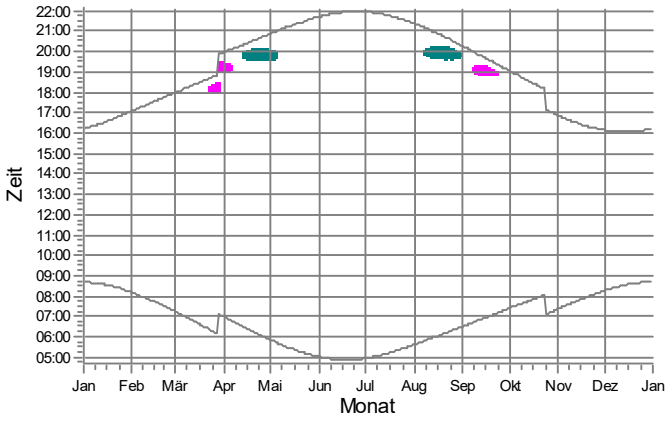
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



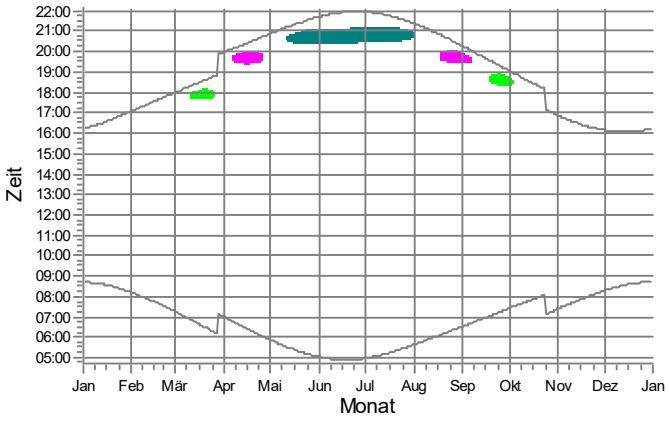
IP16: Kleiner Köven 15A, 21769 Lamstedt



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

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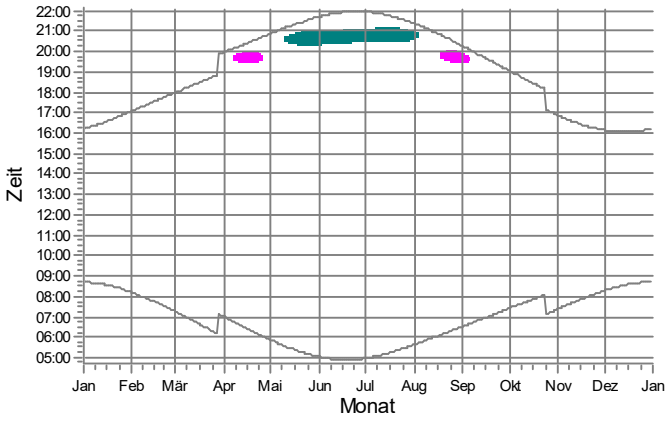
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

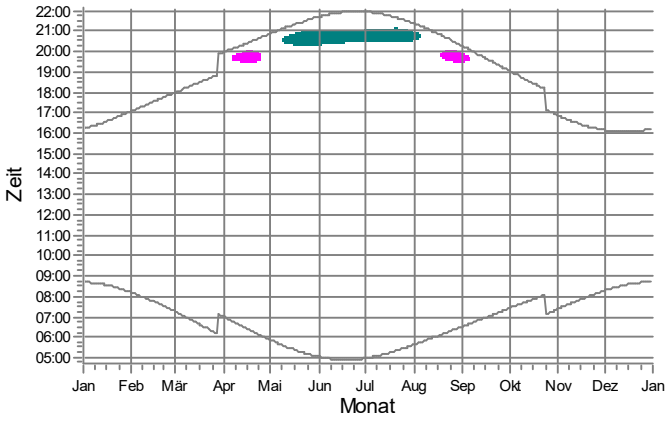
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

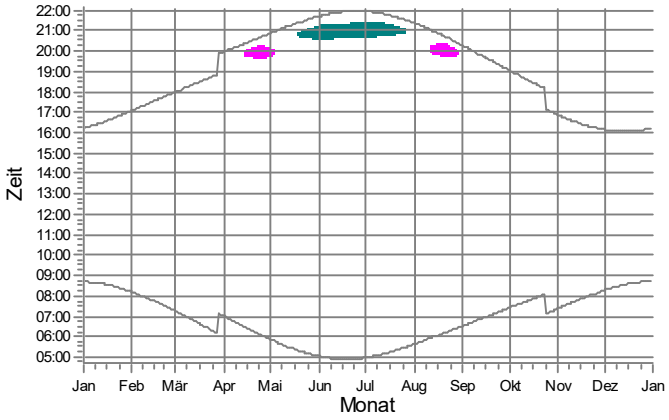
IP19: Wischhofstraße 15, 21769 Lamstedt



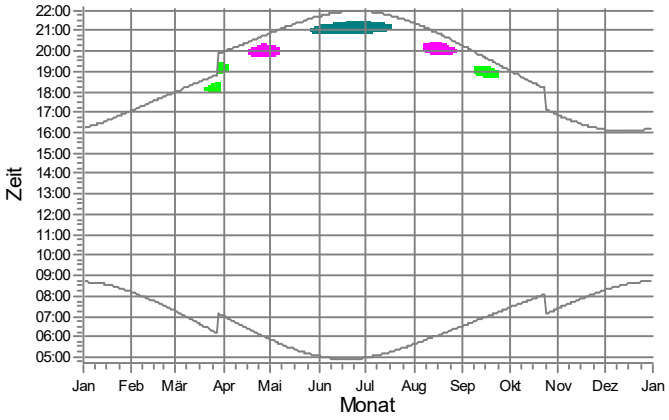
IP20: Wischhofstraße 13, 21769 Lamstedt



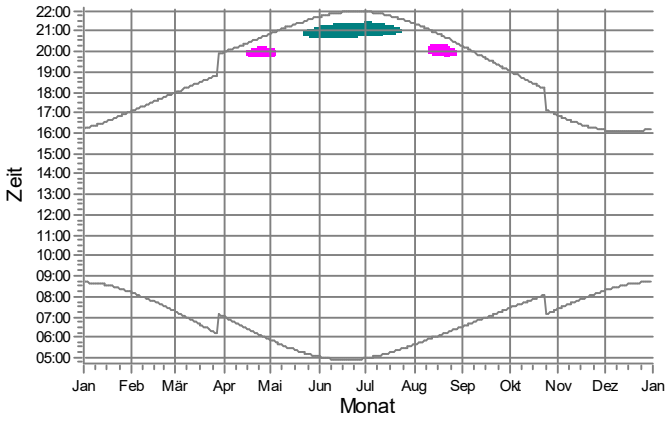
IP21: Auf der Stroth 18, 21769 Lamstedt



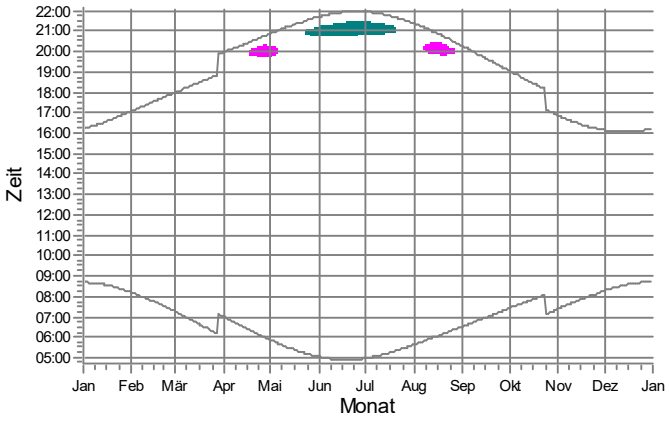
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt



WEA

WEA05: E-175 EP5

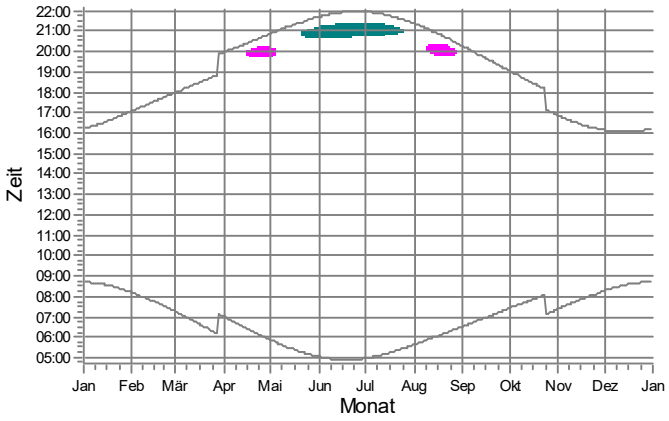
WEA06: E-175 EP5

WEA09: E-175 EP5

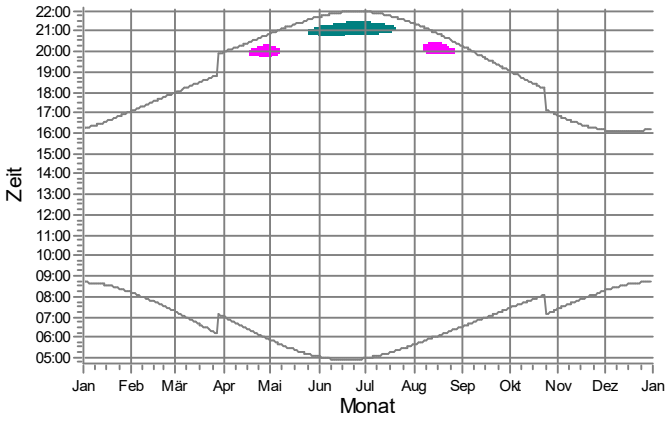
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

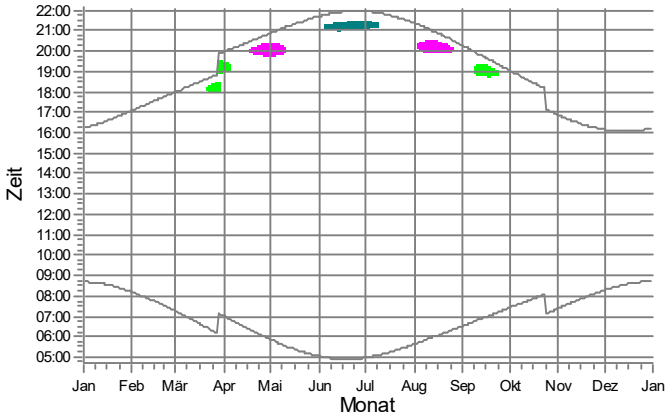
IP25: Auf der Stroth 21, 21769 Lamstedt



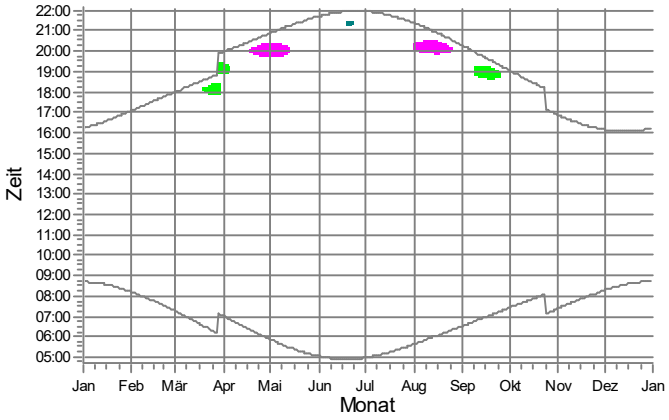
IP26: Auf der Stroth 25, 21769 Lamstedt



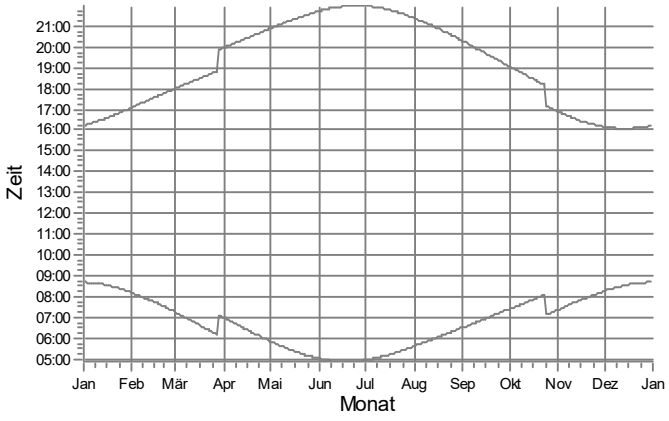
IP27: Strother Heuw eg 1, 21769 Lamstedt



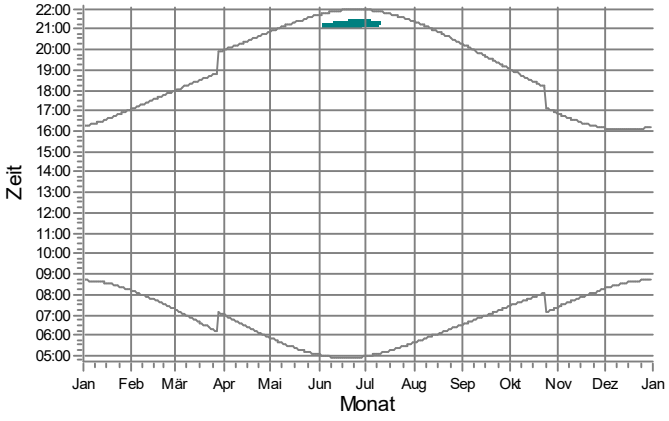
IP28: Strother Heuw eg 9, 21769 Lamstedt



IP29: Birkenw eg 11, 21769 Lamstedt



IP30: Pappelw eg 7, 21769 Lamstedt



WEA

WEA05: E-175 EP5

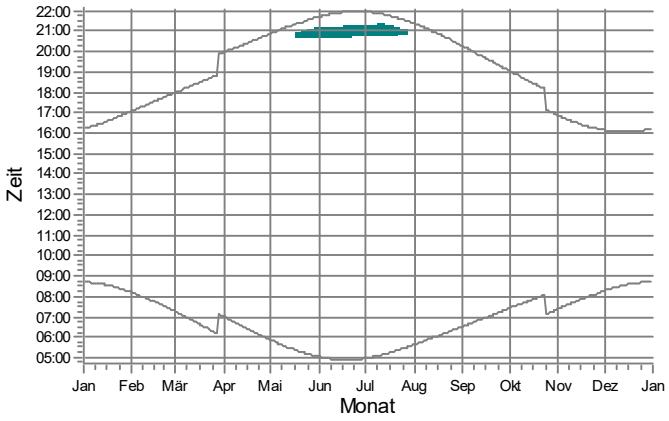
WEA06: E-175 EP5

WEA09: E-175 EP5

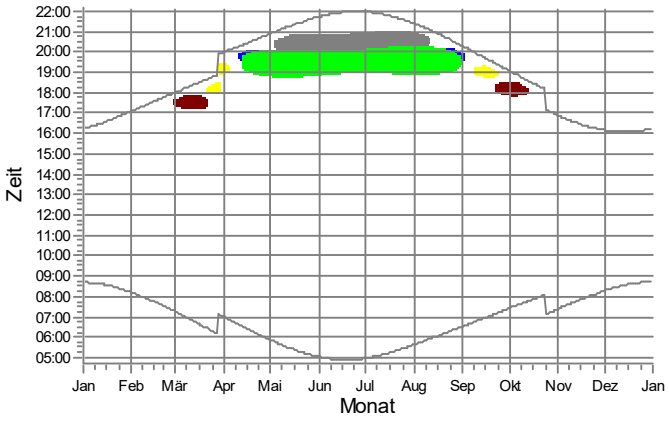
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Zusatzbelastung

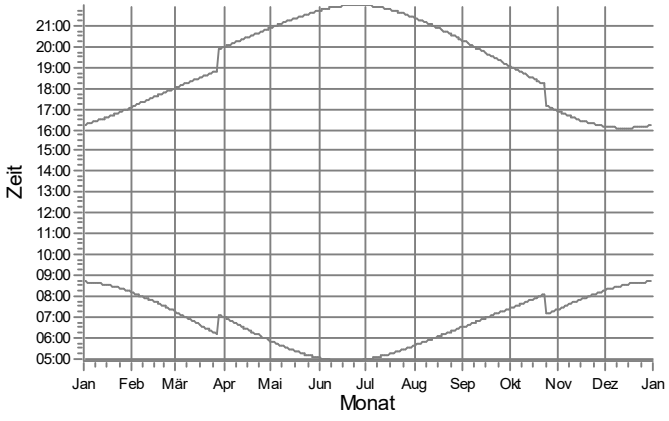
IP31: Jochensw eg 8, 21769 Lamstedt



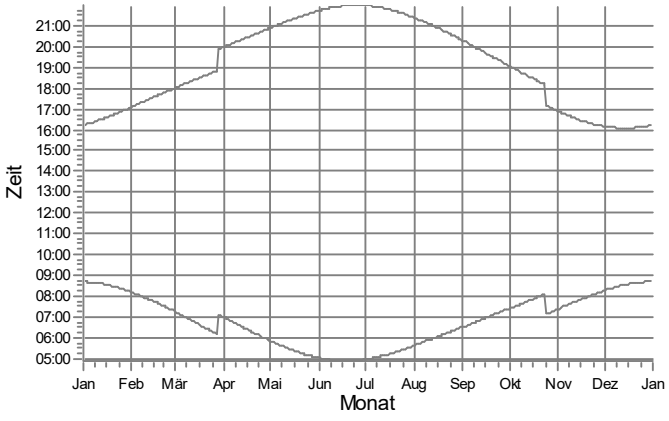
IP32: Driftw eg 1, 21769 Lamstedt



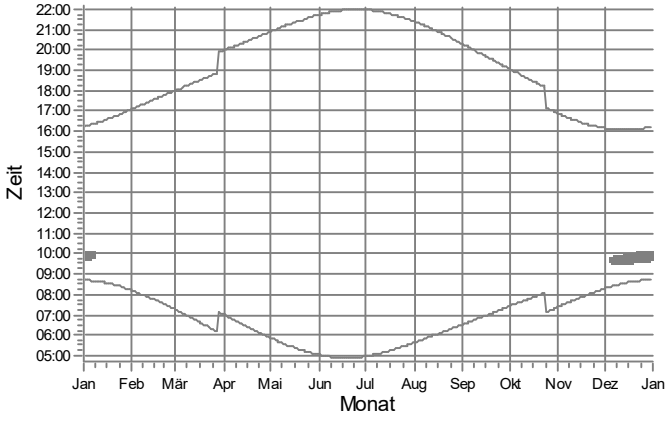
IP33: Horn 23, 21769 Armstorf



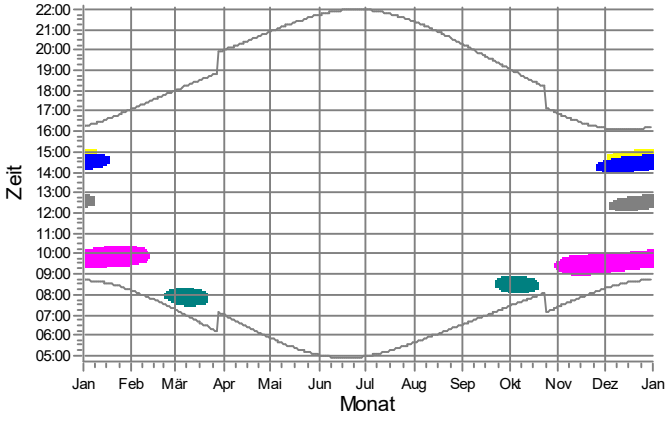
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Hanew orth 2, 21770 Lamstedt



WEA

WEA02: E-175 EP5	WEA05: E-175 EP5	WEA09: E-175 EP5
WEA03: E-175 EP5	WEA06: E-175 EP5	
WEA04: E-175 EP5	WEA08: E-175 EP5	

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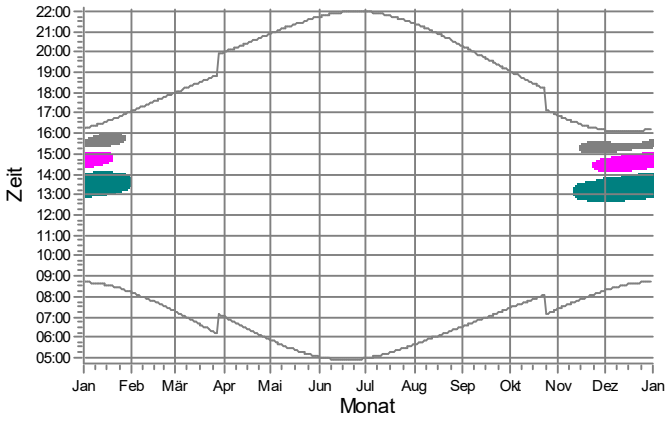
Florian Schmidt
Berechnet:
22.08.2024 15:28/4.0.540

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

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

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

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

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

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 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)	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

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	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

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

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

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

SHADOW - Kalender pro WEA

Berechnung: 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	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

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

SHADOW - Kalender pro WEA

Berechnung: 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

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

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 18:58-20:48/110 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 19:04-20:52/108 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

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):

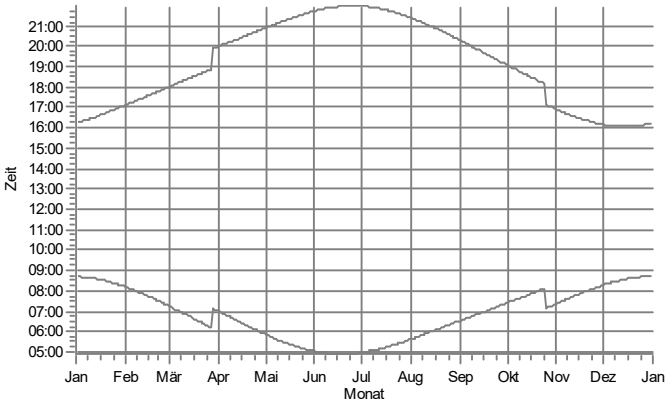
Tag im Monat	Sonnenaufgang (SS:MM)	Zeitpunkt (SS:MM)	Schattenanfang-Zeitpunkt (SS:MM)	Schattenende/Minuten mit Schatten
	Sonnenuntergang (SS:MM)	Zeitpunkt (SS:MM)	Schattenanfang-Zeitpunkt (SS:MM)	Schattenende/Minuten mit Schatten

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

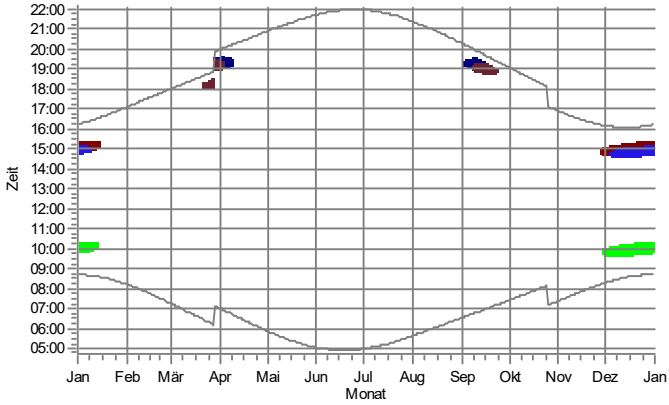
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung

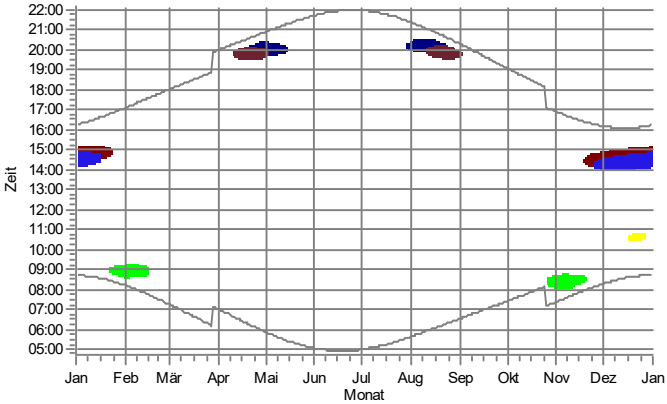
WEA01: E-138 EP3 E3



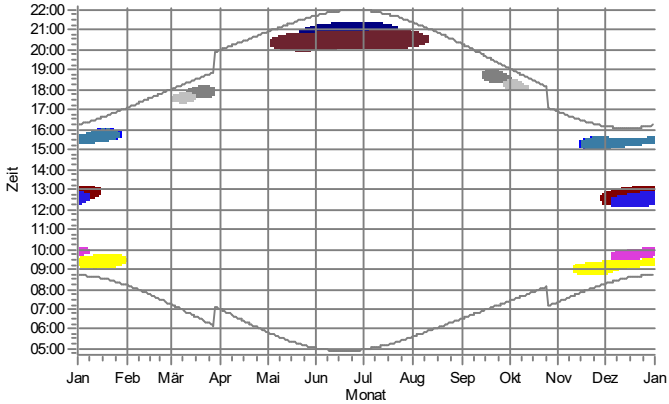
WEA02: E-175 EP5



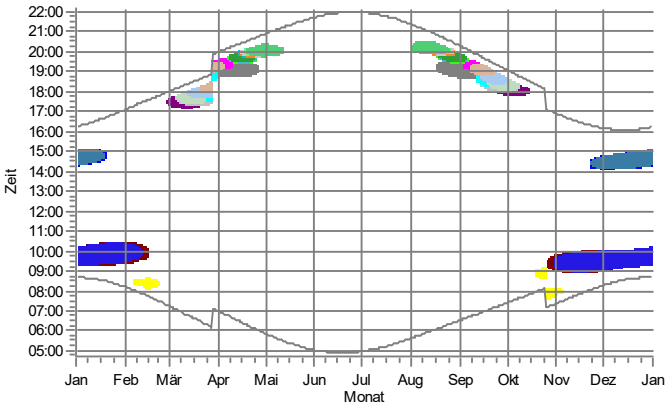
WEA03: E-175 EP5



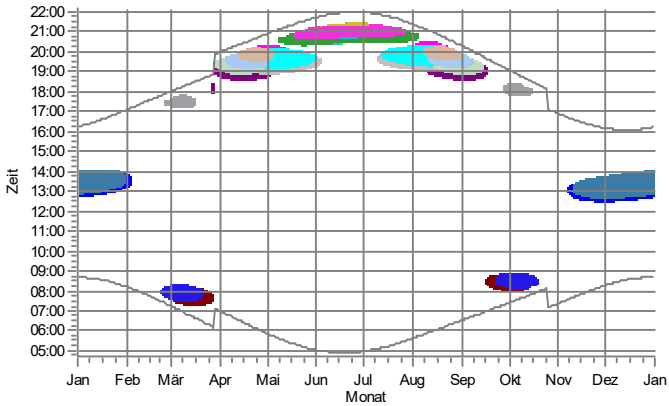
WEA04: E-175 EP5



WEA05: E-175 EP5



WEA06: E-175 EP5



Schattenrezeptoren

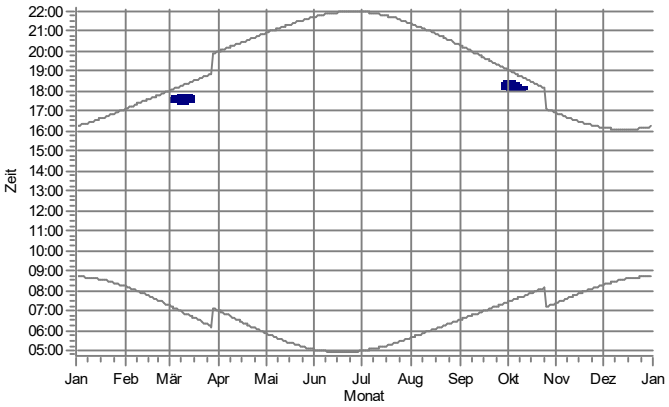
- IP02: Neues Moor 21, 21770 Mittelstenahe
- IP03: Mittelstenaher Str. 30, 21769 Lamstedt
- IP04: Wischhofstraße 10, 21769 Lamstedt
- IP05: Am Kamp 26, 21769 Lamstedt
- IP06: Strother Heuweg 5, 21769 Lamstedt
- IP07: Driftweg 2, 21769 Lamstedt
- IP08: Haneworth 1, 21770 Lamstedt
- IP09: Sticht 5, 21770 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 Köven 15A, 21769 Lamstedt
- IP17: An der Gösche 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

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

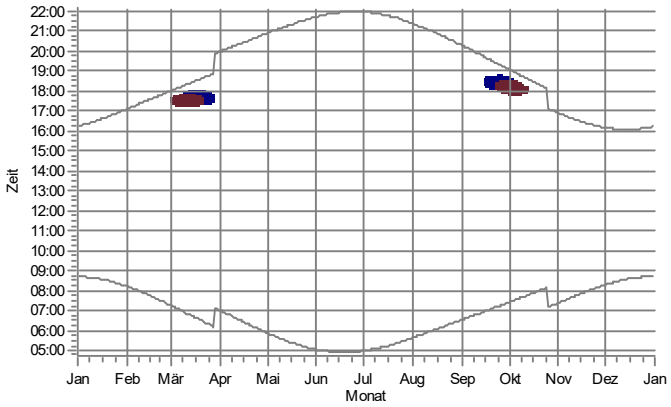
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Zusatzbelastung

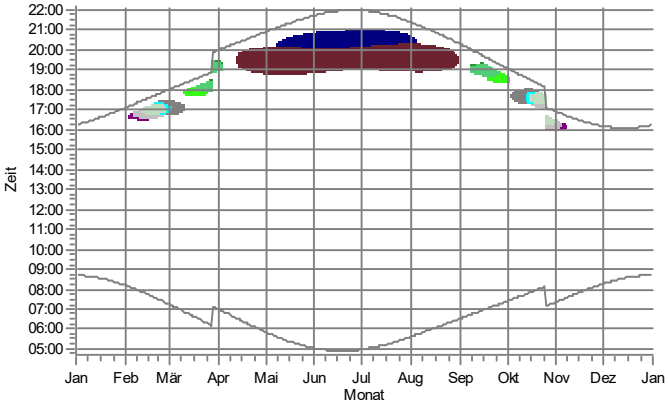
WEA07: E-175 EP5



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

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

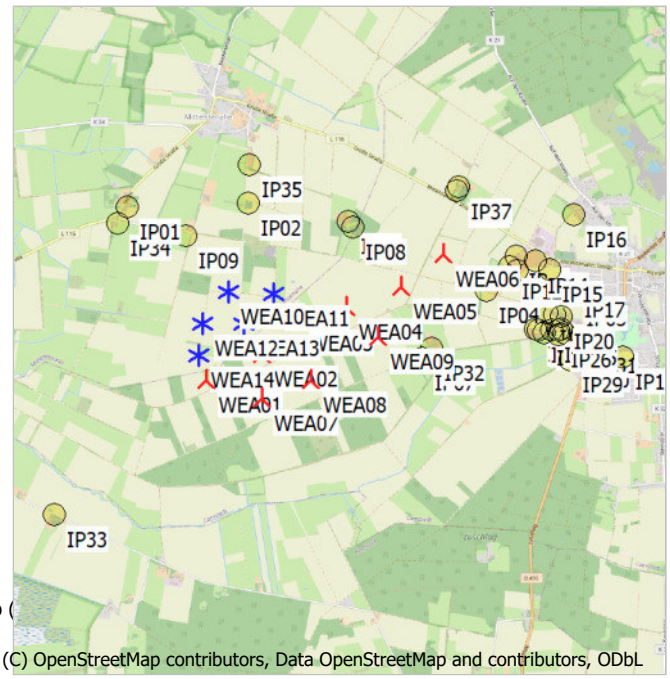
Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
Terraindaten: WAsP (2)

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



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 2,3 MW (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)...

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

		astron. max. mögl. Beschattungsdauer			met. wahrsch. Beschattungsdauer
Nr.	Name	Stunden/Jahr	Schattentage/Jahr	Max.Schattendauer/Tag	Stunden/Jahr
		[h/a]	[d/a]	[h/d]	[h/a]
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)...

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.

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

SHADOW - Kalender

Berechnung: 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)

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

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)

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

SHADOW - Kalender

Berechnung: 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)

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

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)

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

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)

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		05:51		05:02	
	16:14		17:05		18:00		19:58	19:00 (WEA09)	20:53	19:51 (WEA05)	21:43	
2	08:41		08:10		07:12		06:57	19	05:49	28	05:01	
	16:15		17:07		18:02		20:00	19:02 (WEA09)	20:55	20:19 (WEA05)	21:44	
3	08:41		08:08		07:10		06:55	15	05:47	27	05:00	
	16:16		17:09		18:04		20:02	19:17 (WEA09)	20:57	19:51 (WEA05)	21:45	
4	08:41		08:06		07:07		06:52	10	05:45	27	04:59	
	16:17		17:11		18:06		20:04	19:14 (WEA09)	20:58	20:18 (WEA05)	21:46	
5	08:40		08:04		07:05		06:50		05:43	25	04:59	
	16:19		17:13		18:08		20:05		21:00	19:52 (WEA05)	21:47	
6	08:40		08:03		07:03		06:48		05:41	24	04:58	
	16:20		17:15		18:10		20:07		21:02	20:16 (WEA05)	21:48	
7	08:40		08:01		07:00		06:45		05:39	22	04:57	
	16:21		17:17		18:12		20:09		21:04	19:53 (WEA05)	21:49	
8	08:39		07:59		06:58		06:43		05:37	21	04:57	
	16:23		17:19		18:14		20:11		21:05	19:55 (WEA05)	21:50	
9	08:38		07:57		06:56		06:40		05:35	18	04:56	
	16:24		17:21		18:15		20:13		21:07	19:57 (WEA05)	21:51	
10	08:38		07:55		06:53		06:38		05:33	14	04:56	
	16:26		17:23		18:17		20:15		21:09	19:59 (WEA05)	21:52	
11	08:37		07:53		06:51		06:36		05:32	9	04:55	
	16:27		17:25		18:19		20:16		21:11	20:08 (WEA05)	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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

SHADOW - Kalender

Berechnung: 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	
	16:14		17:05		18:00		19:58	23	19:31 (WEA02)	32	20:53	99
2	08:41		08:10		07:12		06:57		19:09 (WEA02)		05:49	
	16:15		17:07		18:02	3	17:35 (WEA07)	24	19:33 (WEA02)	31	20:55	100
3	08:41		08:08		07:10		17:30 (WEA07)		19:08 (WEA02)		05:47	
	16:16		17:09		18:04	7	17:37 (WEA07)	24	19:32 (WEA02)	31	20:57	101
4	08:41		08:06		07:07		17:29 (WEA07)		19:09 (WEA02)		05:45	
	16:17		17:11		18:06	10	17:39 (WEA07)	23	19:32 (WEA02)	30	20:58	102
5	08:40		08:05		07:05		17:27 (WEA07)		19:09 (WEA02)		05:43	
	16:19		17:13		18:08	14	17:41 (WEA07)	22	19:31 (WEA02)	34	21:00	104
6	08:40		08:03		07:03		17:27 (WEA07)		19:09 (WEA02)		05:41	
	16:20		17:15		18:10	16	17:43 (WEA07)	21	19:30 (WEA02)	36	21:02	104
7	08:40		08:01		07:00		17:26 (WEA07)		19:11 (WEA02)		05:39	
	16:21		17:17		18:12	18	17:44 (WEA07)	17	19:28 (WEA02)	36	21:04	105
8	08:39		07:59		06:58		17:26 (WEA07)		19:13 (WEA02)		05:37	
	16:23		17:19		18:14	21	17:47 (WEA07)	13	19:26 (WEA02)	35	21:06	105
9	08:38		07:57		06:56		17:26 (WEA07)		19:15 (WEA02)		05:35	
	16:24		17:21		18:15	23	17:49 (WEA07)	7	19:22 (WEA02)	35	21:07	106
10	08:38		07:55		06:53		17:25 (WEA07)				05:34	
	16:26		17:23		18:17	26	17:51 (WEA08)				21:09	105
11	08:37		07:53		06:51		17:26 (WEA07)				05:32	
	16:27		17:25		18:19	27	17:53 (WEA08)				21:11	106
12	08:36		07:51		06:48		17:26 (WEA07)				05:30	
	16:29		17:27		18:21	28	17:54 (WEA08)				21:12	107
13	08:36		07:49		06:46		17:25 (WEA08)				05:28	
	16:30		17:29		18:23	32	17:57 (WEA08)				21:14	106
14	08:35		07:47		06:44		17:24 (WEA08)				05:26	
	16:32		17:31		18:25	34	17:58 (WEA08)				21:16	107
15	08:34		07:45		06:41		17:24 (WEA08)				05:25	
	16:34		17:33		18:27	34	17:58 (WEA08)				21:18	107
16	08:33		07:43		06:39		17:23 (WEA08)				05:23	
	16:35		17:35		18:29	35	17:58 (WEA08)				21:19	107
17	08:32		07:41		06:36		17:23 (WEA08)				05:21	
	16:37		17:37		18:31	35	17:58 (WEA08)				21:21	107
18	08:31		07:39		06:34		17:23 (WEA08)				05:20	
	16:39		17:39		18:32	35	17:58 (WEA08)				21:22	107
19	08:30		07:37		06:32		17:23 (WEA08)		19:59 (WEA03)		05:18	
	16:40		17:41		18:34	34	17:57 (WEA08)	4	20:03 (WEA03)	59	21:24	107
20	08:29		07:35		06:29		17:23 (WEA08)		19:56 (WEA03)		05:17	
	16:42		17:43		18:36	34	17:57 (WEA08)	8	20:04 (WEA03)	61	21:26	108
21	08:27		07:32		06:27		17:23 (WEA08)		19:54 (WEA03)		05:15	
	16:44		17:45		18:38	33	17:56 (WEA08)	12	20:06 (WEA03)	63	21:27	108
22	08:26		07:30		06:24		17:24 (WEA08)		19:52 (WEA03)		05:14	
	16:46		17:47		18:40	31	17:55 (WEA08)	16	20:08 (WEA03)	69	21:29	108
23	08:25		07:28		06:22		17:24 (WEA08)		19:51 (WEA03)		05:13	
	16:48		17:49		18:42	29	17:53 (WEA08)	19	20:10 (WEA03)	79	21:30	108
24	08:24		07:26		06:19		17:25 (WEA08)		19:50 (WEA03)		05:11	
	16:49		17:50		18:43	27	17:52 (WEA08)	22	20:12 (WEA03)	83	21:32	107
25	08:22		07:24		06:17		17:26 (WEA08)		19:49 (WEA03)		05:10	
	16:51		17:52		18:45	25	18:19 (WEA02)	25	20:14 (WEA03)	88	21:33	107
26	08:21		07:21		06:14		17:28 (WEA08)		19:49 (WEA03)		05:09	
	16:53		17:54		18:47	26	18:21 (WEA02)	26	20:15 (WEA03)	89	21:35	107
27	08:19		07:19		06:12		17:30 (WEA08)		19:48 (WEA03)		05:07	
	16:55		17:56		18:49	24	18:22 (WEA02)	29	20:17 (WEA03)	91	21:36	108
28	08:18		07:17		06:10		17:35 (WEA08)		19:48 (WEA03)		05:06	
	16:57		17:58		18:51	17	18:24 (WEA02)	31	20:19 (WEA03)	93	21:37	107
29	08:16				07:07		19:11 (WEA02)		19:48 (WEA03)		05:05	
	16:59				19:53	16	19:27 (WEA02)	31	20:19 (WEA03)	95	21:39	107
30	08:15				07:05		19:10 (WEA02)		19:47 (WEA03)		05:04	
	17:01				19:54	18	19:28 (WEA02)	32	20:19 (WEA03)	96	21:40	106
31	08:13				07:02		19:09 (WEA02)				05:03	
	17:03				19:56	21	19:30 (WEA02)			97	21:41	
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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: 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)

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

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

SHADOW - Kalender

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

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)

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

SHADOW - Kalender

Berechnung: 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)

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)

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		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		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		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		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		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		07:00		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)

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		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			0,22			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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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

SHADOW - Kalender

Berechnung: 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)

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

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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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		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)

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)

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)

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

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

SHADOW - Kalender

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

SHADOW - Kalender

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

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

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)

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

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)

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)

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)

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)

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 (WEA06)
6	08:40		08:03		07:03			06:48			05:41			04:58		20:54 (WEA06)
	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 (WEA06)
	16:44		17:44		18:38	5	18:11 (WEA09)	20:35	15	20:06 (WEA05)	21:27			21:58	27	21:22 (WEA06)
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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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			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)

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)

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)

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)

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

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)

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

SHADOW - Kalender

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

SHADOW - Kalender

Berechnung: 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		05:51		05:02	
	16:14		17:05		18:00		19:58	19:03 (WEA09)	20:53	19:52 (WEA05)	21:43	
2	08:41		08:10		07:12		06:57	19	05:49	26	05:01	
	16:15		17:07		18:02		20:00	19:04 (WEA09)	20:55	19:52 (WEA05)	21:44	
3	08:41		08:08		07:10		06:55	16	05:47	26	05:00	
	16:16		17:09		18:04		20:02	19:20 (WEA09)	20:57	19:53 (WEA05)	21:45	
4	08:41		08:06		07:07		06:52	19:06 (WEA09)	05:45	24	04:59	
	16:17		17:11		18:06		20:04	11	20:58	20:17 (WEA05)	21:46	
5	08:40		08:04		07:05		06:50	19:17 (WEA09)	05:43	23	04:59	21:10 (WEA06)
	16:19		17:13		18:08		20:05		21:00	19:54 (WEA05)	21:47	3 21:13 (WEA06)
6	08:40		08:03		07:03		06:48		05:41	21	04:58	21:09 (WEA06)
	16:20		17:15		18:10		20:07		21:02	20:15 (WEA05)	21:48	4 21:13 (WEA06)
7	08:39		08:01		07:00		06:45		05:39	18	04:57	21:07 (WEA06)
	16:21		17:17		18:12		20:09		21:04	20:13 (WEA05)	21:49	7 21:14 (WEA06)
8	08:39		07:59		06:58		06:43		05:37	16	04:57	21:07 (WEA06)
	16:23		17:19		18:14		20:11		21:05	20:12 (WEA05)	21:50	8 21:15 (WEA06)
9	08:38		07:57		06:56		06:40		05:35	11	04:56	21:07 (WEA06)
	16:24		17:21		18:15		20:13		21:07	20:10 (WEA05)	21:51	9 21:16 (WEA06)
10	08:38		07:55		06:53		06:38		05:33	5	04:56	21:06 (WEA06)
	16:26		17:23		18:17		20:15		21:09	20:07 (WEA05)	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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		05:51		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		05:49		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		05:47		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		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		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		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		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		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		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		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		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 (WEA06)
	16:44		17:45		18:38	9 18:11 (WEA09)	20:35	10 20:06 (WEA05)	21:27		21:58	1 21:22 (WEA06)
22	08:26		07:30		06:24	18:01 (WEA09)	06:10	19:55 (WEA05)	05:14		04:54	21:22 (WEA06)
	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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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)

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

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)

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)

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		07:00		05:51		05:02	
	16:14		17:05		18:00	3	19:58	16	20:53	71	21:43	109
2	08:41		08:10		07:12		06:57		05:49		05:01	
	16:15		17:07		18:02	9	20:00	12	20:55	71	21:44	107
3	08:41		08:08		07:10		06:55		05:47		05:00	
	16:16		17:09		18:04	13	20:02	4	20:57	72	21:45	107
4	08:41		08:06		07:07		06:53		05:45		04:59	
	16:17		17:11		18:06	17	20:04		20:58	82	21:46	105
5	08:40		08:05		07:05		06:50		05:43		04:59	
	16:19		17:13		18:08	21	20:06		21:00	89	21:47	105
6	08:40		08:03		07:03		06:48		05:41		04:58	
	16:20		17:15		18:10	23	20:07		21:02	92	21:48	104
7	08:40		08:01		07:00		06:45		05:39		04:57	
	16:21		17:17		18:12	26	20:09		21:04	97	21:49	103
8	08:39		07:59		06:58		06:43		05:37		04:57	
	16:23		17:19		18:14	29	20:11		21:06	100	21:50	102
9	08:38		07:57		06:56		06:41		05:35		04:56	
	16:24		17:21		18:15	31	20:13		21:07	103	21:51	102
10	08:38		07:55		06:53		06:38		05:33		04:56	
	16:26		17:23		18:17	31	20:15		21:09	107	21:52	101
11	08:37		07:53		06:51		06:36		05:32		04:55	
	16:27		17:25		18:19	32	20:17	5	21:11	108	21:53	99
12	08:36		07:51		06:48		06:33		05:30		04:55	
	16:29		17:27		18:21	32	20:18	10	21:12	111	21:53	99
13	08:36		07:49		06:46		06:31		05:28		04:54	
	16:30		17:29		18:23	32	20:20	25	21:14	113	21:54	99
14	08:35		07:47		06:44		06:29		05:26		04:54	
	16:32		17:31		18:25	30	20:22	37	21:16	114	21:55	97
15	08:34		07:45		06:41		06:26		05:25		04:54	
	16:34		17:33		18:27	29	20:24	43	21:18	114	21:55	97
16	08:33		07:43		06:39		06:24		05:23		04:54	
	16:35		17:35		18:29	27	20:26	47	21:19	115	21:56	96
17	08:32		07:41		06:36		06:22		05:21		04:54	
	16:37		17:37		18:30	25	20:28	52	21:21	115	21:56	97
18	08:31		07:39		06:34		06:19		05:20		04:54	
	16:39		17:39		18:32	22	20:29	56	21:22	115	21:57	97
19	08:30		07:37		06:32		06:17		05:18		04:54	
	16:40		17:41		18:34	18	20:31	60	21:24	115	21:57	96
20	08:29		07:35		06:29		06:15		05:17		04:54	
	16:42		17:43		18:36	13	20:33	61	21:26	115	21:58	96
21	08:27		07:32		06:27		06:13		05:15		04:54	
	16:44		17:45		18:38	4	20:35	63	21:27	114	21:58	96
22	08:26		07:30		06:24		06:10		05:14		04:54	
	16:46		17:47		18:40	9	20:37	64	21:29	115	21:58	96
23	08:25		07:28		06:22		06:08		05:13		04:54	
	16:48		17:48		18:42	11	20:39	64	21:30	114	21:58	96
24	08:24		07:26		06:19		06:06		05:11		04:55	
	16:49		17:50		18:43	14	20:40	65	21:32	114	21:58	97
25	08:22		07:24		06:17		06:04		05:10		04:55	
	16:51		17:52		18:45	17	20:42	65	21:33	114	21:58	97
26	08:21		07:21		06:14		06:02		05:09		04:55	
	16:53		17:54		18:47	19	20:44	65	21:35	113	21:58	97
27	08:19		07:19		06:12		05:59		05:07		04:56	
	16:55		17:56		18:49	21	20:46	66	21:36	113	21:58	97
28	08:18		07:17		06:10		05:57		05:06		04:56	
	16:57		17:58		18:51	23	20:48	68	21:37	111	21:58	97
29	08:16				07:07		05:55		05:05		04:57	
	16:59				19:53	22	20:49	68	21:39	111	21:58	99
30	08:15				07:05		05:53		05:04		04:57	
	17:01				19:54	21	20:51	70	21:40	109	21:58	99
31	08:13				07:02				05:03			
	17:03				19:56	19			21:41	109		
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)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: 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	16:06
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			0,22			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)

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)

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

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

SHADOW - Kalender

Berechnung: 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)

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)

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 (WEA02)
6	05:02		05:46		06:40			07:33		08:10 (WEA06)	07:32		09:06 (WEA05)	08:24		09:10 (WEA05)
	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 (WEA05)
	21:40		20:42		19:28			18:16			16:20	62	15:34 (WEA13)	16:05	127	15:02 (WEA02)
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)

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):

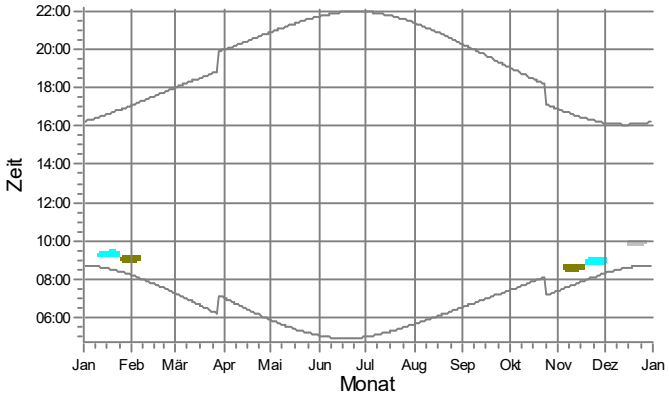
Tag im Monat	Sonnenaufgang (SS:MM)		Zeitpunkt (SS:MM) Schattenanfang	(WEA mit erstem Schatten)
	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenende	(WEA mit letztem Schatten)

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

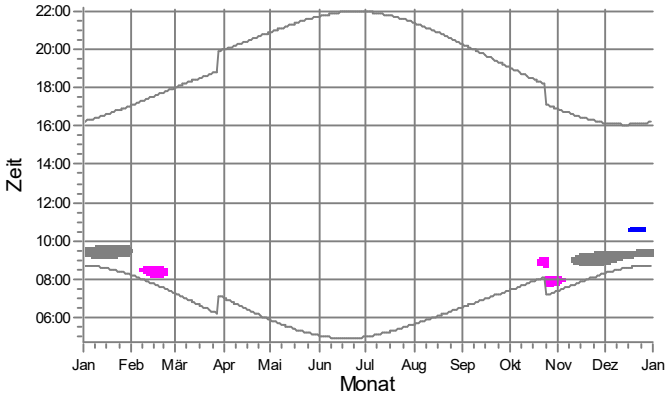
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

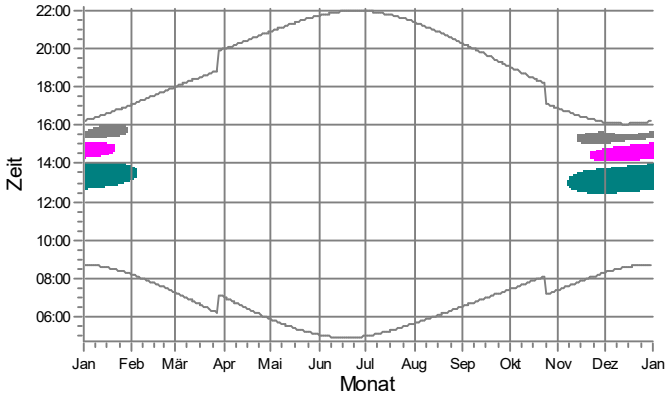
IP01: Sticht 1, 21770 Mittelstenahe



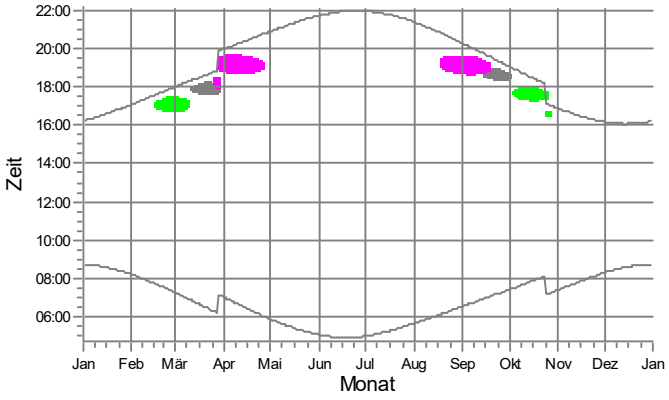
IP02: Neues Moor 21, 21770 Mittelstenahe



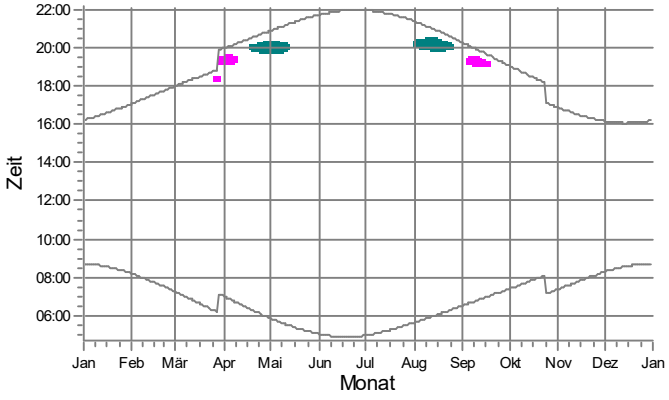
IP03: Mittelstenaher Str. 30, 21769 Lamstedt



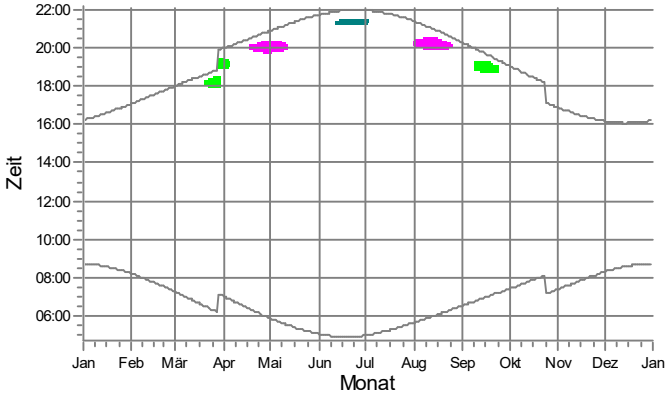
IP04: Wischhofstraße 10, 21769 Lamstedt



IP05: Am Kamp 26, 21769 Lamstedt



IP06: Strother Heuw eg 5, 21769 Lamstedt



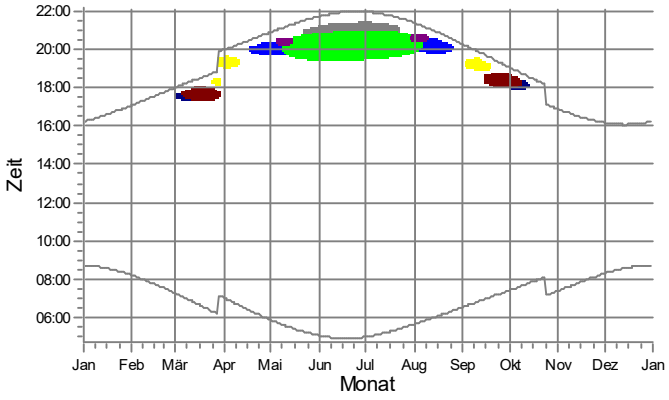
WEA

WEA03: E-175 EP5	WEA06: E-175 EP5	WEA12: E-70 E4 (M5)
WEA04: E-175 EP5	WEA09: E-175 EP5	WEA13: E-70 E4 (M6)
WEA05: E-175 EP5	WEA10: E-70 E4 (M2)	

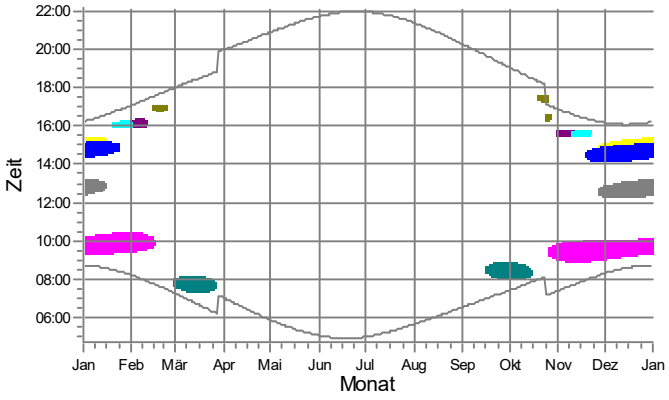
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

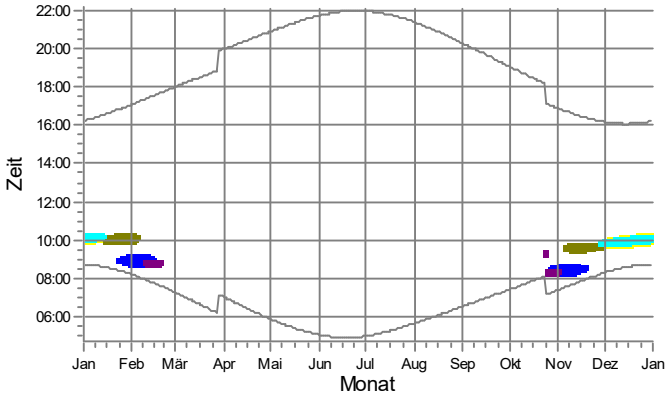
IP07: Driftw eg 2, 21769 Lamstedt



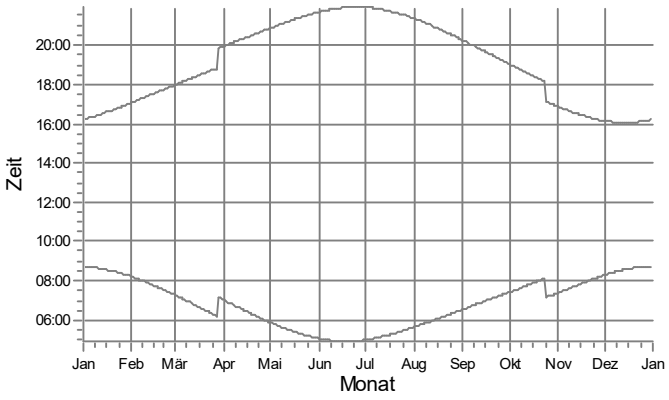
IP08: Hanew orth 1, 21770 Lamstedt



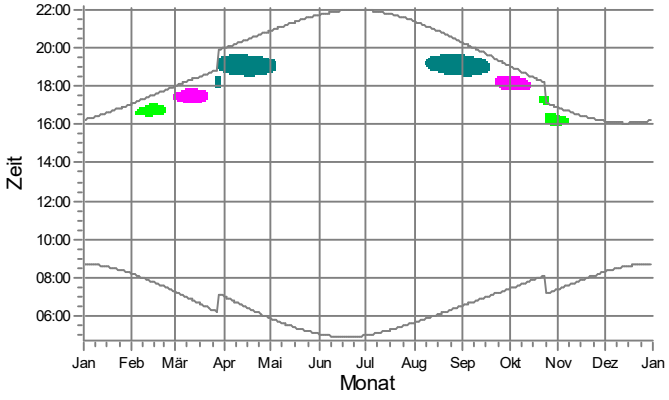
IP09: Sticht 5, 21770 Mittelstenahe



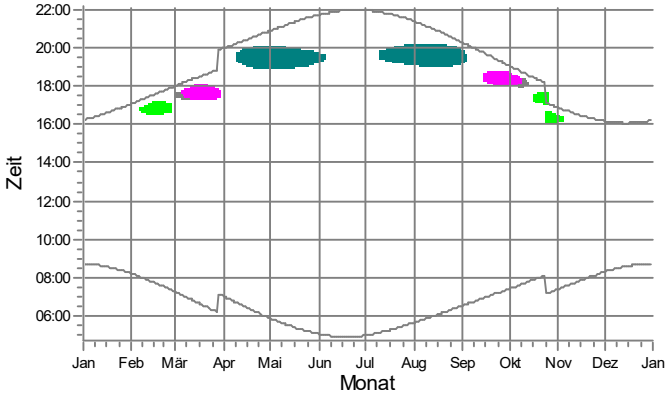
IP10: Falkenhorst 1, 21769 Lamstedt



IP11: Auf dem Kampen 2, 21769 Lamstedt



IP12: Auf dem Kampen 6, 21769 Lamstedt



WEA

WEA02: E-175 EP5	WEA06: E-175 EP5	WEA10: E-70 E4 (M2)
WEA03: E-175 EP5	WEA07: E-175 EP5	WEA11: E-70 E4 (M3)
WEA04: E-175 EP5	WEA08: E-175 EP5	WEA13: E-70 E4 (M6)
WEA05: E-175 EP5	WEA09: E-175 EP5	

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Florian Schmidt
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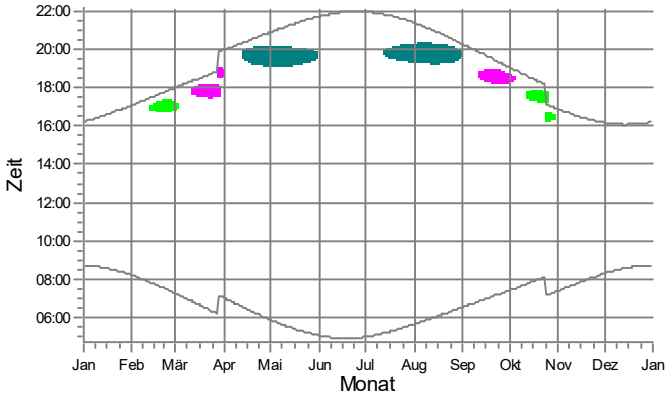
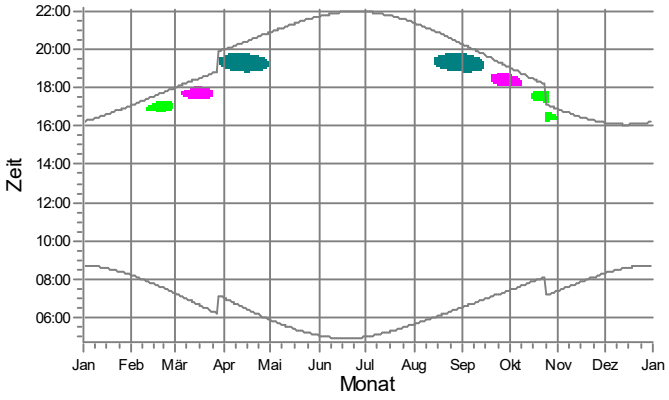
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

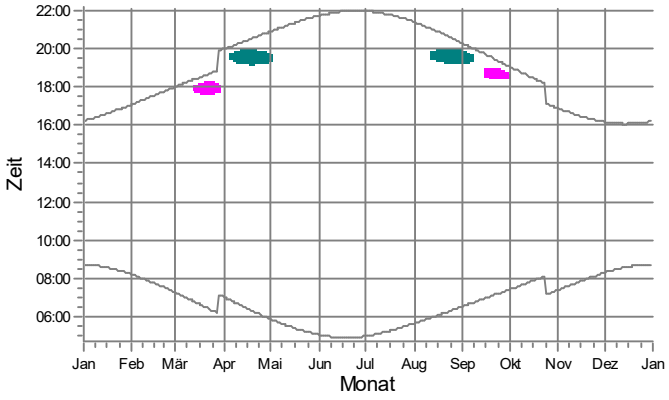
IP13: Auf dem Kampen 5, 21769 Lamstedt



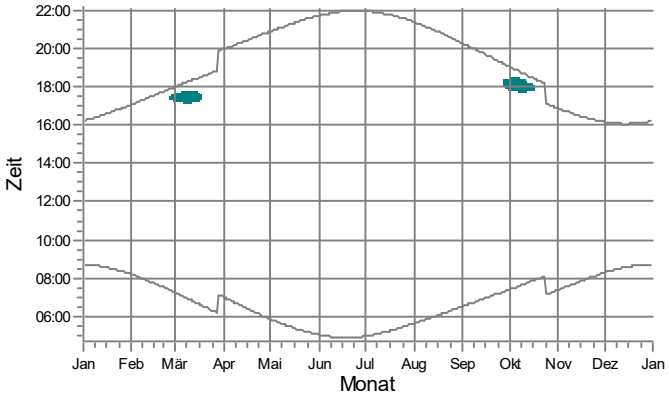
IP14: Heinrich-Evers-Straße 4A, 21769 Lamstedt



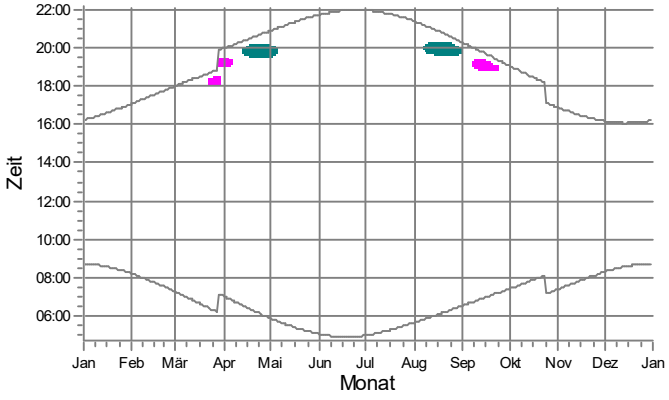
IP15: Heinrich-Evers-Straße 1, 21769 Lamstedt



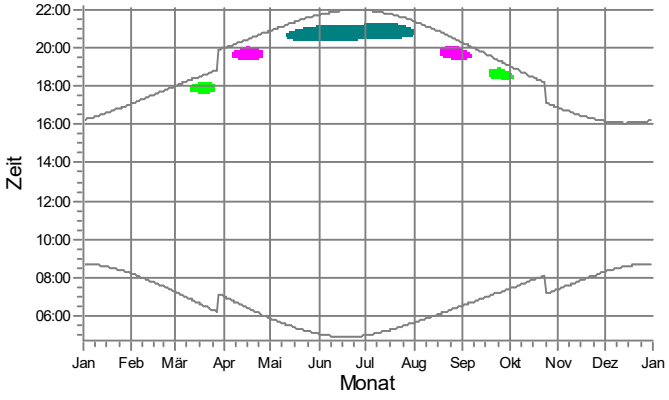
IP16: Kleiner Köven 15A, 21769 Lamstedt



IP17: An der Gösche 10, 21769 Lamstedt



IP18: Wischhofstraße 17a, 21769 Lamstedt



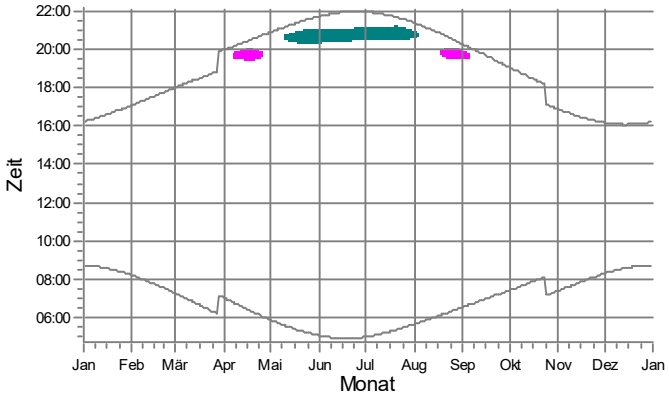
WEA

WEA05: E-175 EP5 WEA06: E-175 EP5 WEA09: E-175 EP5

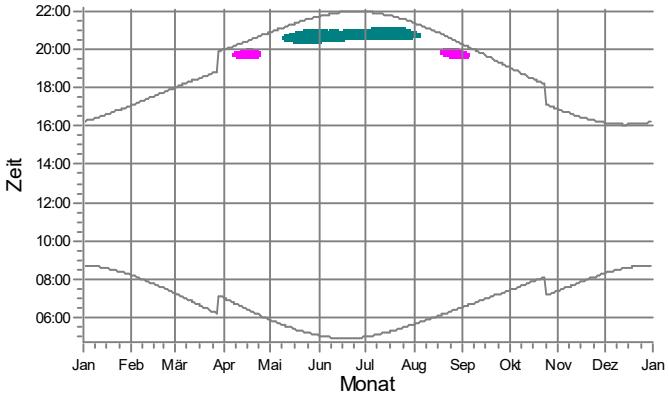
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

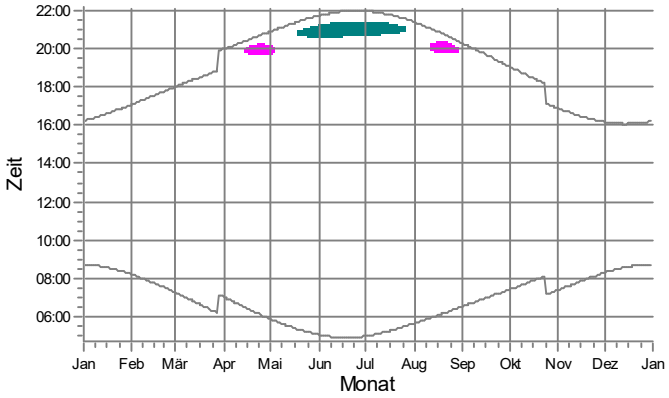
IP19: Wischhofstraße 15, 21769 Lamstedt



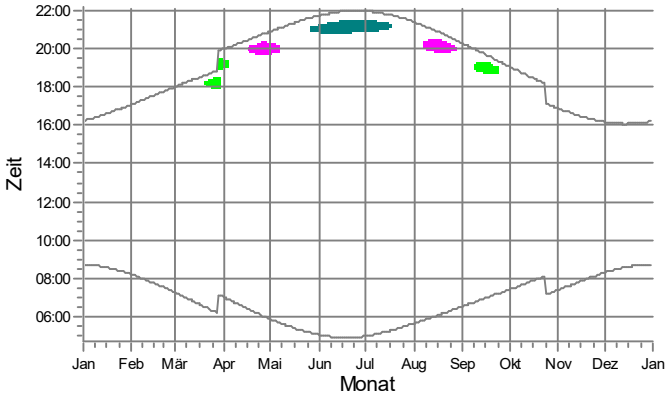
IP20: Wischhofstraße 13, 21769 Lamstedt



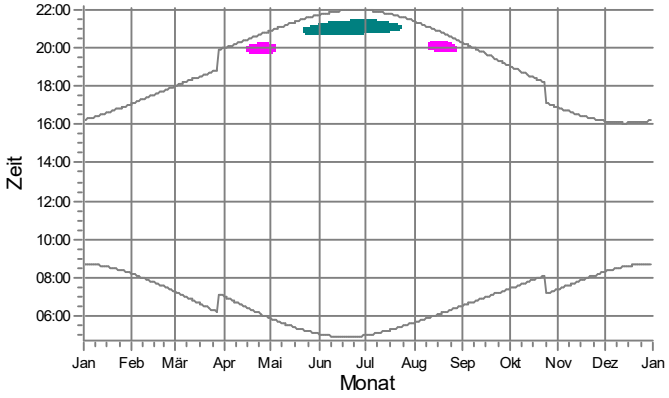
IP21: Auf der Stroth 18, 21769 Lamstedt



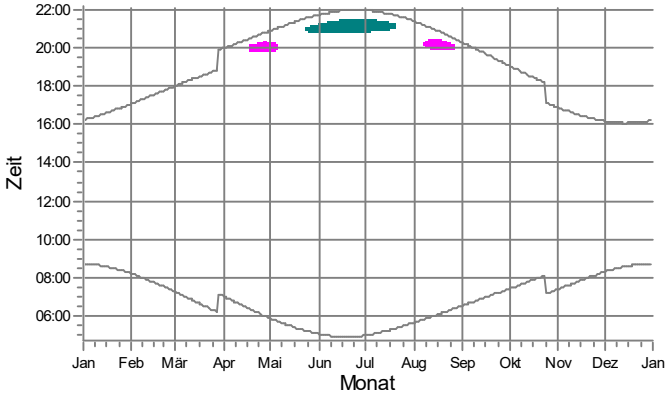
IP22: Auf der Stroth 24, 21769 Lamstedt



IP23: Auf der Stroth 20, 21769 Lamstedt



IP24: Auf der Stroth 23, 21769 Lamstedt



WEA

WEA05: E-175 EP5

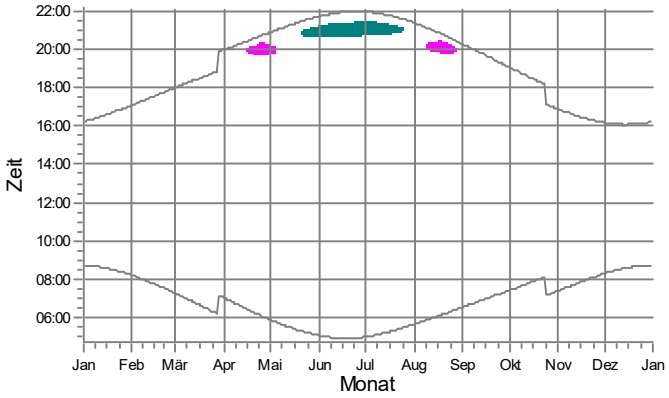
WEA06: E-175 EP5

WEA09: E-175 EP5

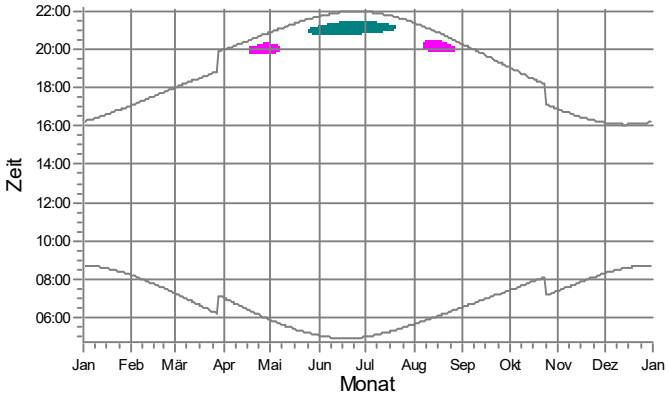
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

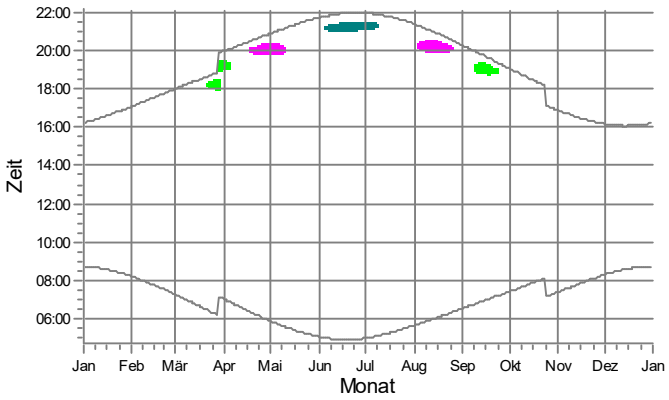
IP25: Auf der Stroth 21, 21769 Lamstedt



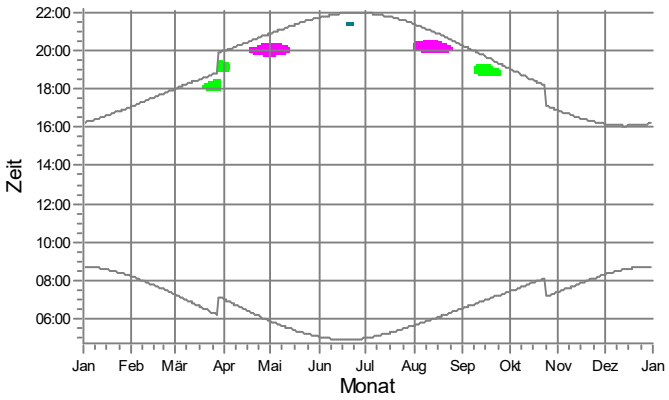
IP26: Auf der Stroth 25, 21769 Lamstedt



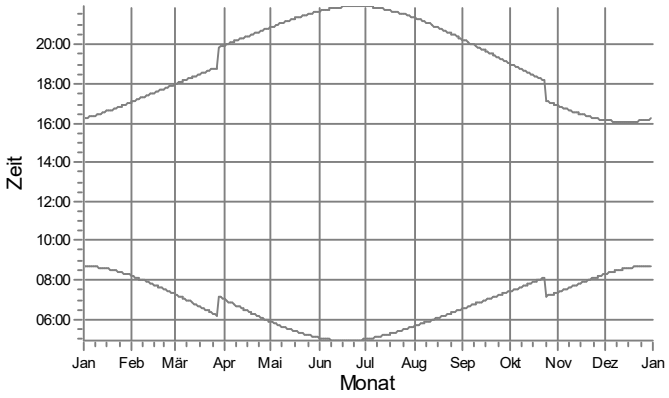
IP27: Strother Heuw eg 1, 21769 Lamstedt



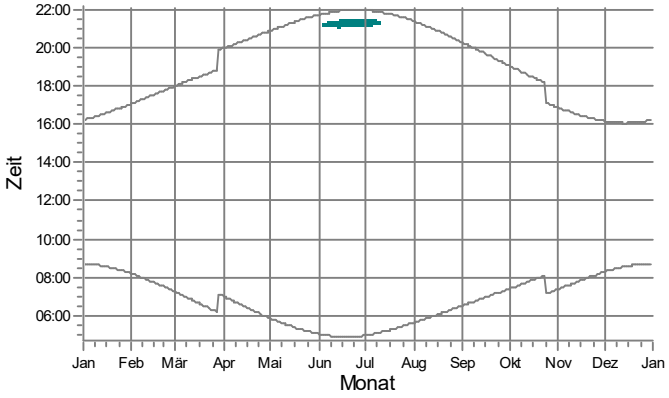
IP28: Strother Heuw eg 9, 21769 Lamstedt



IP29: Birkenw eg 11, 21769 Lamstedt



IP30: Pappelw eg 7, 21769 Lamstedt



WEA

WEA05: E-175 EP5

WEA06: E-175 EP5

WEA09: E-175 EP5

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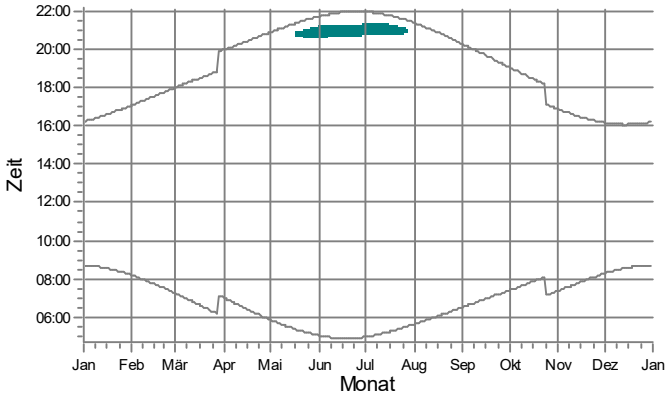
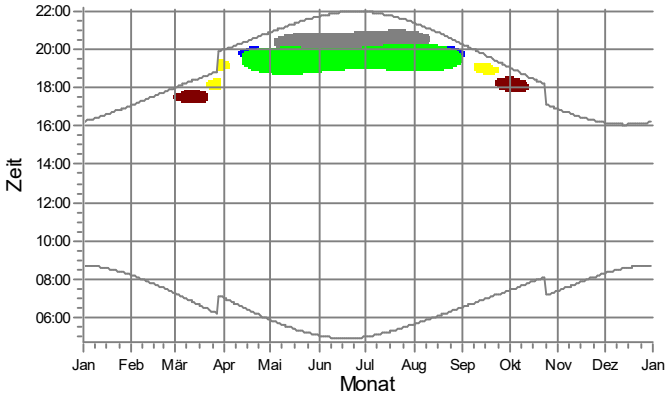
SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung

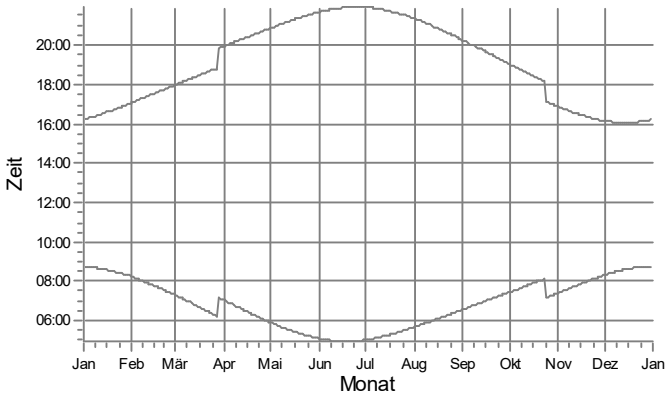
IP31: Jochensw eg 8, 21769 Lamstedt



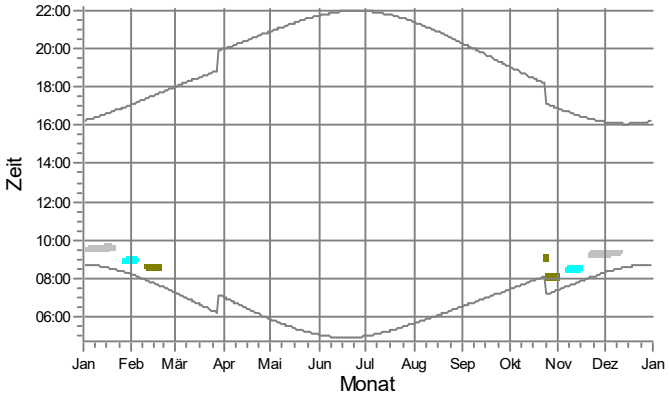
IP32: Driftw eg 1, 21769 Lamstedt



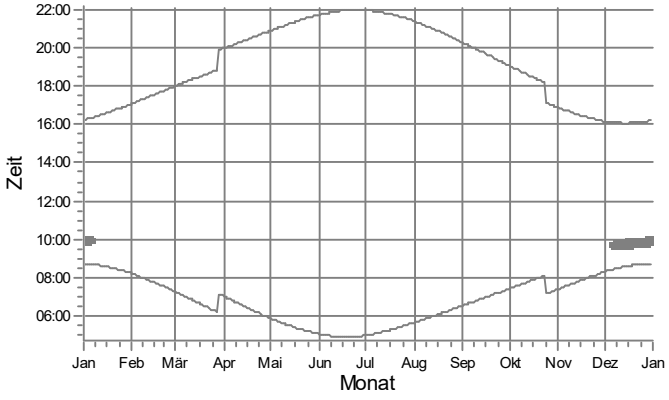
IP33: Horn 23, 21769 Armstorf



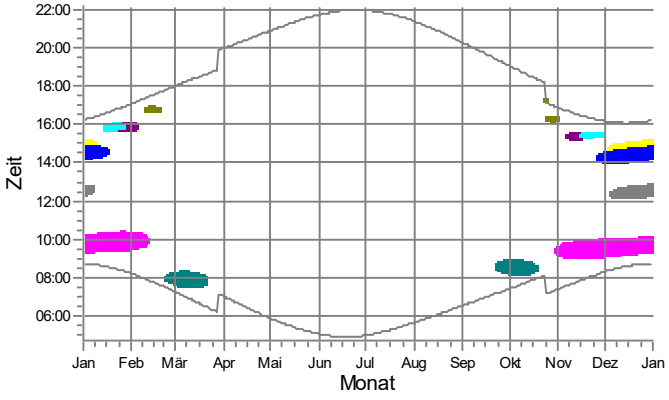
IP34: Sticht 3, 21770 Mittelstenahe



IP35: Neues Moor 19, 21770 Mittelstenahe



IP36: Hanew orth 2, 21770 Lamstedt



WEA

WEA02: E-175 EP5	WEA06: E-175 EP5	WEA11: E-70 E4 (M3)
WEA03: E-175 EP5	WEA08: E-175 EP5	WEA12: E-70 E4 (M5)
WEA04: E-175 EP5	WEA09: E-175 EP5	WEA13: E-70 E4 (M6)
WEA05: E-175 EP5	WEA10: E-70 E4 (M2)	

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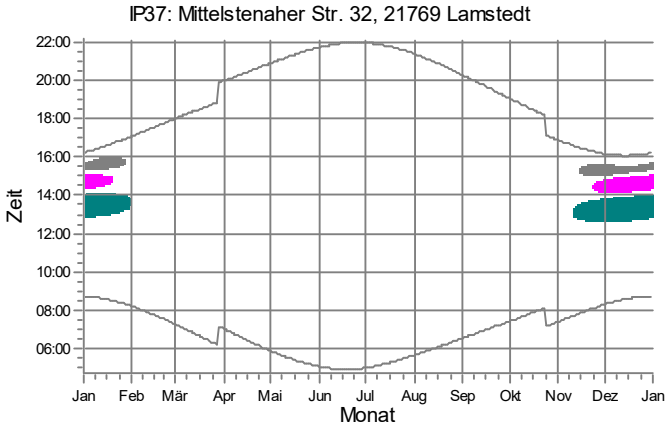
22.08.2024 15:30/4.0.540

SHADOW - Grafischer Kalender

Berechnung: SW24020 Lamstedt Gesamtbelastung



WEA

WEA04: E-175 EP5

WEA05: E-175 EP5

WEA06: E-175 EP5

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
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	16:19	17:13	18:08	20:06	21:00	21:47	21:56	21:15	20:07	18:54	16:45	16:07
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	16:42	17:43	18:36	20:33	21:26	21:58	21:41	20:44	19:30	18:19	16:21	16:05
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	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

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

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

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	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

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		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

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

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

SHADOW - Kalender pro WEA

Berechnung: 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

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

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

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

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	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

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		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

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 18:58-20:48/110 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 19:04-20:52/108 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

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

SHADOW - Kalender pro WEA

Berechnung: 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

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

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

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

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 09:14-09:24/10
	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 09:14-09:23/9
	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	07:09	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

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

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

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

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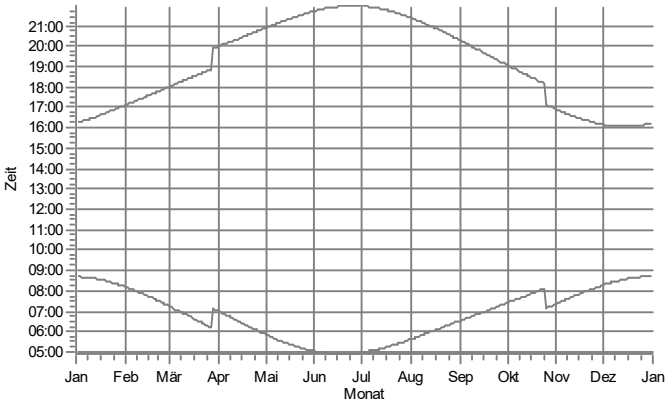
DE-41517 Grevenbroich
+49 2181 2278 0
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

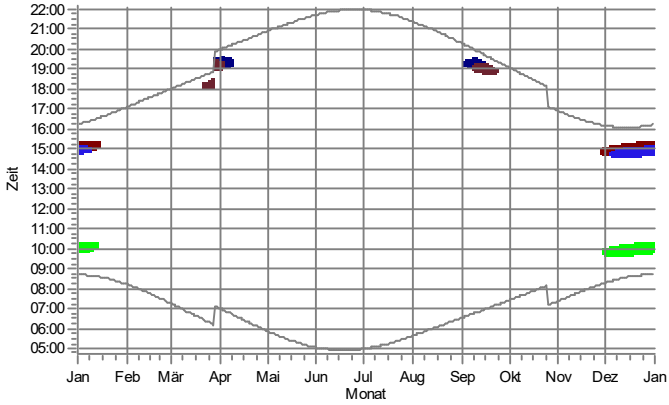
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

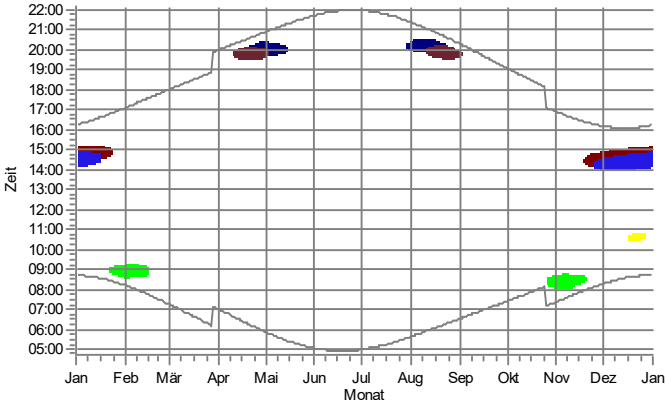
WEA01: E-138 EP3 E3



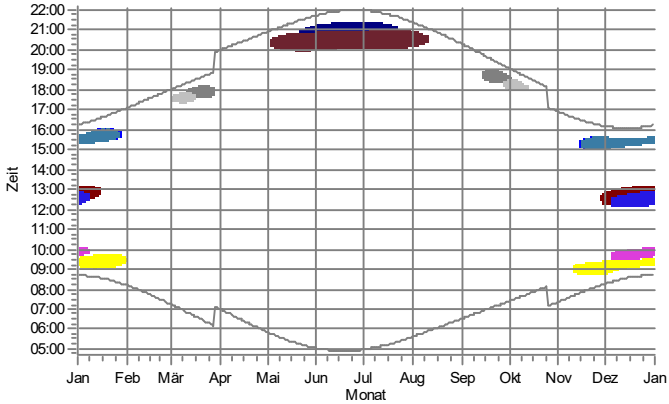
WEA02: E-175 EP5



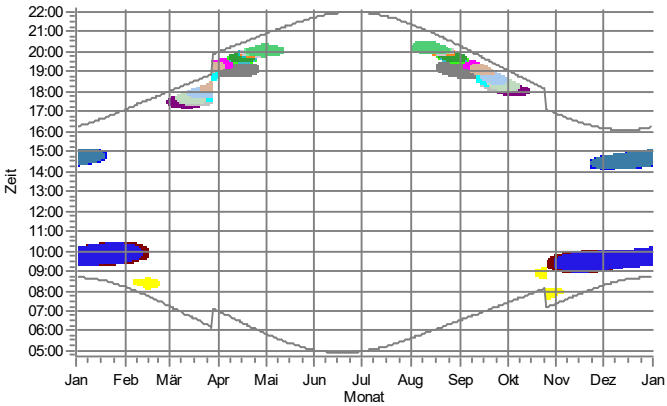
WEA03: E-175 EP5



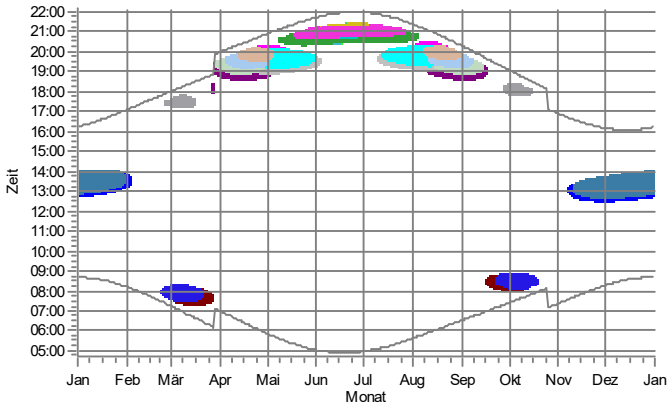
WEA04: E-175 EP5



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 Köven 15A, 21769 Lamstedt
- IP17: An der Gösche 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

Lizenzierter Anwender:
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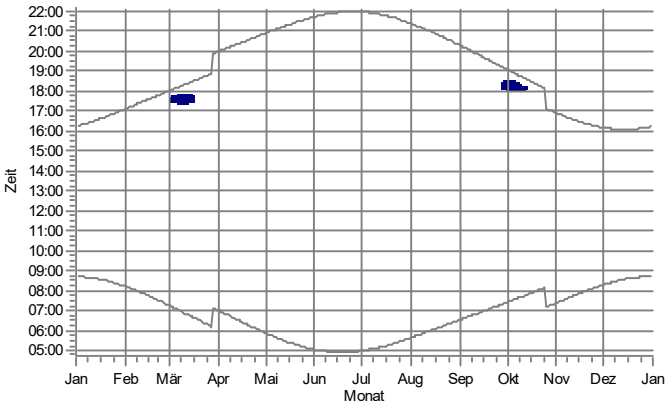
Florian Schmidt
Berechnet:
22.08.2024 15:30/4.0.540

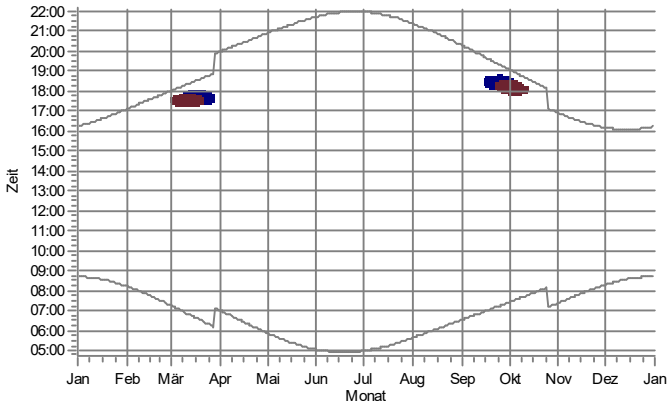
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

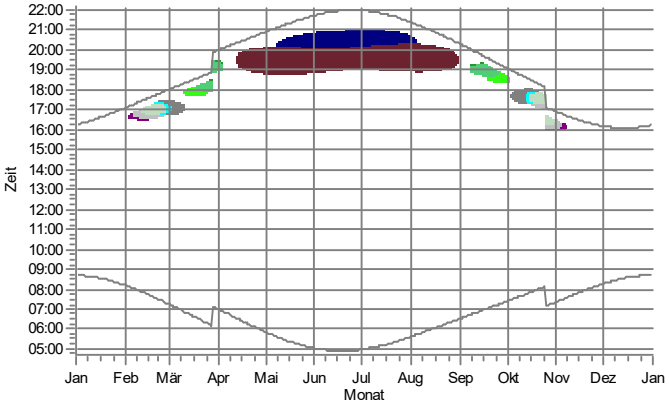
WEA07: E-175 EP5



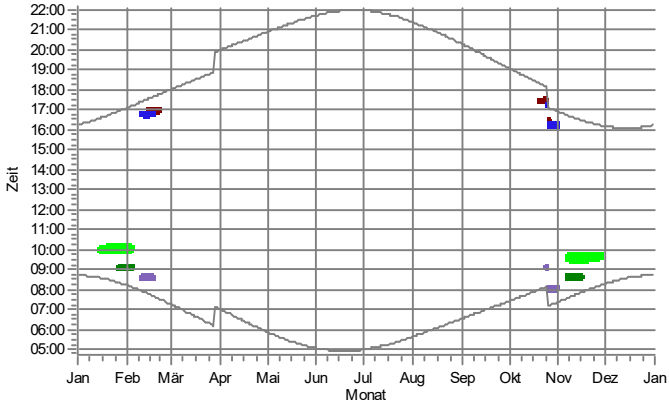
WEA08: E-175 EP5



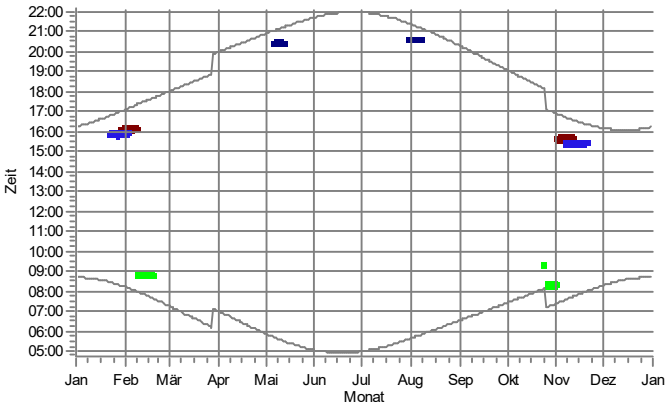
WEA09: E-175 EP5



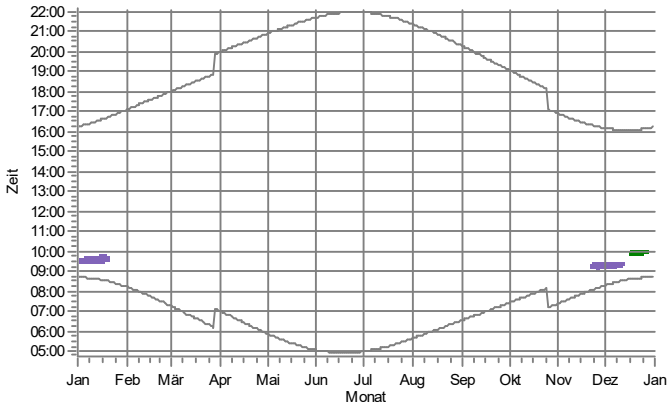
WEA10: E-70 E4 (M2)



WEA11: E-70 E4 (M3)



WEA12: E-70 E4 (M5)



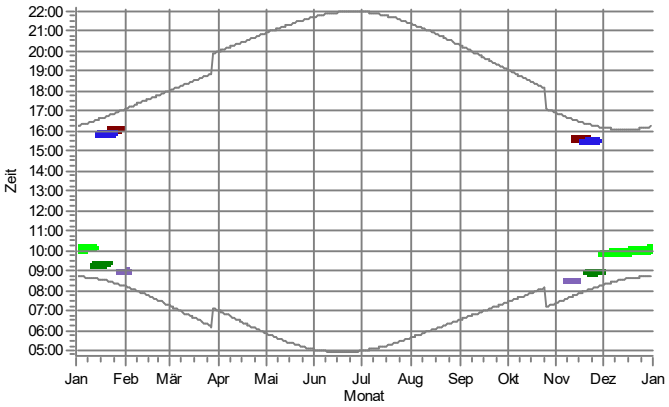
Schattenrezeptoren

- 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

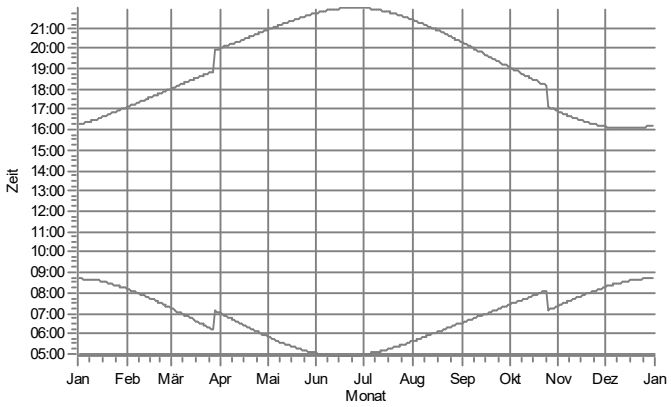
SHADOW - Grafischer Kalender pro WEA

Berechnung: SW24020 Lamstedt Gesamtbelastung

WEA 13: E-70 E4 (M6)



WEA 14: 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