

SHADOW - Hauptergebnis

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm

Voraussetzungen für Berechnung des Schattenwurfs

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) [GEISENHEIM]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,48	2,93	3,80	5,50	6,94	6,23	7,34	6,96	5,12	2,77	1,83	1,21

Betriebsstunden ermittelt aus WEA in Berechnung und Windverteilung:
TDO: Hechtsheim

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
335	502	703	682	487	528	701	1.072	1.337	901	465	321	8.033

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: Höhenraster-Objekt (23)

Hindernisse in Berechnung nicht verwendet

Augenhöhe: 1,5 m

Rasterauflösung: 10,0 m

Alle Koordinatenangaben in:

ETRS 89 Zone: 32

WEA

	X(Ost)	Y(Nord)	Z	Beschreibung	WEA-Typ		Typ	Nennleistung [kW]	Rotor- durchmesser [m]	Nabenhöhe [m]	Schattendaten	
					Aktuell	Hersteller					Beschatt.- Bereich [m]	U/min [U/min]
WEA H5	445.732	5.533.267	166,7	GE WIND EN...	Ja	GE WIND ENERGY	GE 5.3-158-5.300	5.300	158,0	161,0	1.816	0,0

Schattenrezeptor-Eingabe

Nr.	Name	X(Ost)	Y(Nord)	Z	Breite	Höhe	Höhe über Grund	Azimutwinkel (von Süd)	Neigung des Fensters	Ausrichtungsmodus
				[m]	[m]	[m]	[m]	[°]	[°]	
IO 01	Mainz-Ebersheim, Mögliches Wohnhaus	445.817	5.530.003	201,9	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 02	Klein-Winternheim, Steinritsch 10	444.283	5.532.531	201,0	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 03	Mainz-Marienborn, Klein-Winternheimer-Str. 19	444.504	5.534.256	161,0	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 04	Mainz-Marienborn, Altkönigstr. 70	444.831	5.534.260	170,0	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 05	Mainz-Marienborn, Hinter dem Chaussee-Haus	445.267	5.534.205	161,0	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 06	Mainz-Hechtsheim, Adam-Opel-Str. 5	446.466	5.533.896	155,6	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 07	Mainz-Hechtsheim, Am Weidezeihen	447.489	5.533.696	152,5	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 08	Mainz-Hechtsheim, Baumschule Fuchs	447.203	5.532.816	162,4	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 09	Mainz-Hechtsheim, Mögliches Wohnhaus	446.258	5.532.959	169,3	1,0	1,0	1,0	-180,0	90,0	"Gewächshaus-Modus"
IO 10	Mainz-Hechtsheim, mögliches Wohnhaus	446.300	5.532.645	184,1	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 12	Mainz-Hechtsheim, Adam-Opel-Str. 6	446.328	5.534.098	161,3	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 13	Mainz-Hechtsheim, Adam-Opel-Str. 10	446.349	5.533.864	155,9	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 14	Mainz-Hechtsheim, Adam-Opel-Str. 8	446.341	5.534.006	158,7	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 15	Klein-Winternheim, Hechtsheimer Berg 53	444.241	5.532.696	202,0	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 17	Klein-Winternheim, Karthause 13	444.231	5.532.609	200,2	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"
IO 18	Klein-Winternheim, Hechtsheimer Berg 57	444.206	5.532.736	201,8	1,0	1,0	1,0	0,0	90,0	"Gewächshaus-Modus"

Berechnungsergebnisse

Schattenrezeptor

Nr.	Name	astron. max. mögl. Beschattungsdauer			met. wahrsch. Beschattungsdauer	
		Stunden/Jahr	Schattentage/a	Max.Schatten Stunden/Tag	Stunden/Jahr	
		[Std/Jahr]	[Tage/Jahr]	[Std/Tag]	[Std/Jahr]	
IO 01	Mainz-Ebersheim, Mögliches Wohnhaus	0:00	0	0:00	0:00	
IO 02	Klein-Winternheim, Steinritsch 10	20:38	80	0:24	5:51	

(Fortsetzung nächste Seite)...



Maßstab 1:75.000
Neue WEA
Schattenrezeptor

SHADOW - Hauptergebnis

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm

...(Fortsetzung von letzter Seite)

Nr.	Name	astron. max. mögl. Beschattungsdauer		met. wahrsch. Beschattungsdauer	
		Stunden/Jahr	Schattentage/a	Max.Schatten Stunden/Tag	Stunden/Jahr
		[Std/Jahr]	[Tage/Jahr]	[Std/Tag]	[Std/Jahr]
IO 03	Mainz-Marienborn, Klein-Winternheimer-Str. 19	14:42	48	0:24	1:26
IO 04	Mainz-Marienborn, Altkönigstr. 70	29:52	68	0:29	2:23
IO 05	Mainz-Marienborn, Hinter dem Chaussee-Haus	11:24	34	0:26	0:54
IO 06	Mainz-Hechtsheim, Adam-Opel-Str. 5	33:21	68	0:39	4:55
IO 07	Mainz-Hechtsheim, Am Weidezehnten	6:47	26	0:20	1:13
IO 08	Mainz-Hechtsheim, Baumschule Fuchs	12:39	40	0:25	3:02
IO 09	Mainz-Hechtsheim, Mögliches Wohnhaus	9:42	27	0:27	1:57
IO 10	Mainz- Hechtsheim, mögliches Wohnhaus	0:00	0	0:00	0:00
IO 12	Mainz-Hechtsheim, Adam-Opel-Str. 6	37:23	68	0:39	4:04
IO 13	Mainz-Hechtsheim, Adam-Opel-Str. 10	44:53	81	0:44	6:19
IO 14	Mainz-Hechtsheim, Adam-Opel-Str. 8	51:09	86	0:41	5:49
IO 15	Klein-Winternheim, Hechtsheimer Berg 53	11:09	42	0:24	3:17
IO 17	Klein-Winternheim, Karthause 13	12:28	47	0:23	3:41
IO 18	Klein-Winternheim, Hechtsheimer Berg 57	9:59	39	0:23	2:54

Gesamtmenge der max. mögl. Beschattung an Rezeptoren pro WEA

Nr.	Name	Maximal	Erwartet
		[Std/Jahr]	[Std/Jahr]
	WEA H5 GE WIND ENERGY GE 5.3-158 5300 158.0 !O! NH: 161,0 m (Ges:240,0 m) (721)	233:06	35:54

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 01 - Mainz-Ebersheim, Mögliches Wohnhaus
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
335	502	703	682	487	528	701	1.072	1.337	901	465	321	8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:26 16:36	08:02 17:21	07:13 18:08	07:06 19:58	06:06 20:45	05:24 21:27	05:22 21:40	05:56 21:11	06:41 20:13	07:26 19:08	07:15 17:06	08:03 16:29
2	08:26 16:37	08:01 17:22	07:11 18:10	07:04 20:00	06:04 20:46	05:24 21:28	05:23 21:40	05:57 21:10	06:43 20:11	07:28 19:06	07:17 17:04	08:04 16:29
3	08:26 16:38	07:59 17:24	07:09 18:12	07:02 20:01	06:02 20:48	05:23 21:29	05:24 21:39	05:59 21:08	06:44 20:09	07:29 19:04	07:19 17:03	08:05 16:28
4	08:26 16:39	07:58 17:26	07:07 18:13	07:00 20:03	06:01 20:49	05:22 21:30	05:24 21:39	06:00 21:06	06:46 20:07	07:31 19:02	07:20 17:01	08:07 16:28
5	08:25 16:40	07:56 17:27	07:04 18:15	06:58 20:04	05:59 20:51	05:22 21:31	05:25 21:38	06:01 21:05	06:47 20:05	07:32 18:59	07:22 16:59	08:08 16:27
6	08:25 16:41	07:55 17:29	07:02 18:17	06:56 20:06	05:57 20:52	05:21 21:31	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57	07:24 16:58	08:09 16:27
7	08:25 16:43	07:53 17:31	07:00 18:18	06:54 20:07	05:56 20:54	05:21 21:32	05:27 21:38	06:04 21:02	06:50 20:01	07:35 18:55	07:25 16:56	08:10 16:27
8	08:24 16:44	07:52 17:33	06:58 18:20	06:51 20:09	05:54 20:55	05:20 21:33	05:27 21:37	06:06 21:00	06:52 19:58	07:37 18:53	07:27 16:55	08:11 16:27
9	08:24 16:45	07:50 17:34	06:56 18:21	06:49 20:10	05:52 20:57	05:20 21:34	05:28 21:36	06:07 20:58	06:53 19:56	07:38 18:51	07:29 16:53	08:13 16:26
10	08:24 16:46	07:48 17:36	06:54 18:23	06:47 20:12	05:51 20:58	05:19 21:35	05:29 21:36	06:09 20:56	06:55 19:54	07:40 18:49	07:30 16:52	08:14 16:26
11	08:23 16:48	07:47 17:38	06:52 18:25	06:45 20:14	05:49 21:00	05:19 21:35	05:30 21:35	06:10 20:55	06:56 19:52	07:41 18:47	07:32 16:50	08:15 16:26
12	08:23 16:49	07:45 17:40	06:50 18:26	06:43 20:15	05:48 21:01	05:19 21:36	05:31 21:34	06:12 20:53	06:58 19:50	07:43 18:45	07:34 16:49	08:16 16:26
13	08:22 16:50	07:43 17:41	06:48 18:28	06:41 20:17	05:46 21:03	05:19 21:37	05:32 21:34	06:13 20:51	06:59 19:47	07:45 18:43	07:35 16:48	08:17 16:26
14	08:21 16:52	07:41 17:43	06:45 18:30	06:39 20:18	05:45 21:04	05:18 21:37	05:33 21:33	06:14 20:49	07:00 19:45	07:46 18:40	07:37 16:46	08:18 16:26
15	08:21 16:53	07:40 17:45	06:43 18:31	06:37 20:20	05:43 21:05	05:18 21:38	05:34 21:32	06:16 20:47	07:02 19:43	07:48 18:38	07:39 16:45	08:18 16:26
16	08:20 16:55	07:38 17:46	06:41 18:33	06:35 20:21	05:42 21:07	05:18 21:38	05:35 21:31	06:17 20:45	07:03 19:41	07:49 18:36	07:40 16:44	08:19 16:26
17	08:19 16:56	07:36 17:48	06:39 18:34	06:33 20:23	05:40 21:08	05:18 21:39	05:37 21:30	06:19 20:44	07:05 19:39	07:51 18:34	07:42 16:42	08:20 16:26
18	08:18 16:58	07:34 17:50	06:37 18:36	06:31 20:25	05:39 21:10	05:18 21:39	05:38 21:29	06:20 20:42	07:06 19:37	07:53 18:32	07:43 16:41	08:21 16:27
19	08:17 16:59	07:32 17:52	06:35 18:38	06:29 20:26	05:38 21:11	05:18 21:39	05:39 21:28	06:22 20:40	07:08 19:34	07:54 18:30	07:45 16:40	08:21 16:27
20	08:16 17:01	07:30 17:53	06:32 18:39	06:27 20:28	05:37 21:12	05:18 21:40	05:40 21:27	06:23 20:38	07:09 19:32	07:56 18:28	07:47 16:39	08:22 16:27
21	08:15 17:02	07:29 17:55	06:30 18:41	06:25 20:29	05:35 21:14	05:18 21:40	05:41 21:26	06:25 20:36	07:11 19:30	07:57 18:26	07:48 16:38	08:23 16:28
22	08:14 17:04	07:27 17:57	06:28 18:42	06:23 20:31	05:34 21:15	05:19 21:40	05:42 21:25	06:26 20:34	07:12 19:28	07:59 18:24	07:50 16:37	08:23 16:28
23	08:13 17:06	07:25 17:58	06:26 18:44	06:21 20:32	05:33 21:16	05:19 21:40	05:44 21:23	06:28 20:32	07:14 19:26	08:01 18:23	07:51 16:36	08:24 16:29
24	08:12 17:07	07:23 18:00	06:24 18:45	06:19 20:34	05:32 21:17	05:19 21:40	05:45 21:22	06:29 20:30	07:15 19:23	08:02 18:21	07:53 16:35	08:24 16:29
25	08:11 17:09	07:21 18:02	06:22 18:47	06:17 20:35	05:31 21:19	05:19 21:40	05:46 21:21	06:31 20:28	07:17 19:21	08:04 17:19	07:54 16:34	08:25 16:30
26	08:10 17:11	07:19 18:03	06:19 18:49	06:15 20:37	05:30 21:20	05:20 21:40	05:48 21:20	06:32 20:26	07:18 19:19	08:06 17:17	07:56 16:33	08:25 16:31
27	08:09 17:12	07:17 18:05	06:17 18:50	06:13 20:38	05:29 21:21	05:20 21:40	05:49 21:18	06:34 20:24	07:20 19:17	08:07 17:15	07:57 16:32	08:25 16:31
28	08:08 17:14	07:15 18:07	06:15 18:52	06:11 20:40	05:28 21:22	05:21 21:40	05:50 21:17	06:35 20:22	07:21 19:15	08:09 17:13	07:59 16:32	08:25 16:32
29	08:06 17:16		07:13 19:53	06:09 20:42	05:27 21:23	05:21 21:40	05:52 21:16	06:37 20:20	07:23 19:12	08:11 17:11	08:00 16:31	08:26 16:33
30	08:05 17:17		07:11 19:55	06:08 20:43	05:26 21:24	05:22 21:40	05:53 21:14	06:38 20:18	07:24 19:10	08:12 17:10	08:01 16:30	08:26 16:34
31	08:04 17:19		07:09 19:56		05:25 21:26		05:54 21:13	06:40 20:15		07:14 17:08		08:26 16:35
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	254
astr.max.mögl.Beschattung												
Red.Sonnenscheinwahrsch.												
Reduktion Betriebsdauer												
Reduktion Windrichtung												
Gesamte Reduktion												
Met.wahrsch.Beschattung												

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG
Energie-Allee 1
DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 02 - Klein-Winternheim, Steinritsch 10
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:26 16:36	08:02 17:21	07:13 18:08	07:06 19:58	06:06 20:45	05:24 21:27	05:57 (WEA H5) 06:19 (WEA H5)	05:22 21:40	06:08 (WEA H5) 06:21 (WEA H5)	05:56 21:11	06:41 20:13	07:26 19:08
2	08:26 16:37	08:01 17:22	07:11 18:10	07:04 20:00	06:04 20:46	05:24 21:28	05:58 (WEA H5) 06:19 (WEA H5)	05:23 21:40	06:08 (WEA H5) 06:22 (WEA H5)	05:57 21:10	06:43 20:11	07:28 19:06
3	08:26 16:38	07:59 17:24	07:09 18:12	07:02 20:01	06:02 20:48	05:23 21:29	05:58 (WEA H5) 06:19 (WEA H5)	05:24 21:39	06:07 (WEA H5) 06:22 (WEA H5)	05:59 21:08	06:44 20:09	07:29 19:04
4	08:26 16:39	07:58 17:26	07:07 18:13	07:00 20:03	06:01 20:49	05:22 21:30	05:59 (WEA H5) 06:18 (WEA H5)	05:24 21:39	06:07 (WEA H5) 06:23 (WEA H5)	06:00 21:07	06:46 20:07	07:31 19:02
5	08:26 16:40	07:56 17:27	07:05 18:15	06:58 20:04	05:59 20:51	05:22 21:31	06:00 (WEA H5) 06:18 (WEA H5)	05:25 21:39	06:07 (WEA H5) 06:24 (WEA H5)	06:01 21:05	06:47 20:05	07:32 18:59
6	08:25 16:41	07:55 17:29	07:03 18:17	06:56 20:06	05:57 20:52	05:21 21:32	06:00 (WEA H5) 06:18 (WEA H5)	05:26 21:38	06:06 (WEA H5) 06:24 (WEA H5)	06:03 21:03	06:49 20:03	07:34 18:57
7	08:25 16:43	07:53 17:31	07:00 18:18	06:54 20:07	05:56 20:54	05:21 21:32	06:01 (WEA H5) 06:18 (WEA H5)	05:27 21:38	06:06 (WEA H5) 06:24 (WEA H5)	06:04 21:02	06:50 20:01	07:35 18:55
8	08:25 16:44	07:52 17:33	06:58 18:20	06:51 20:09	05:54 20:55	05:20 21:33	06:02 (WEA H5) 06:18 (WEA H5)	05:27 21:37	06:06 (WEA H5) 06:25 (WEA H5)	06:06 21:00	06:52 19:59	07:37 18:53
9	08:24 16:45	07:50 17:34	06:56 18:22	06:49 20:11	05:52 20:57	05:20 21:34	06:01 (WEA H5) 06:17 (WEA H5)	05:28 21:37	06:06 (WEA H5) 06:26 (WEA H5)	06:07 20:58	06:53 19:56	07:38 18:51
10	08:24 16:46	07:48 17:36	06:54 18:23	06:47 20:12	05:51 20:58	05:19 21:35	06:02 (WEA H5) 06:17 (WEA H5)	05:29 21:36	06:06 (WEA H5) 06:27 (WEA H5)	06:09 20:57	06:55 19:54	07:40 18:49
11	08:23 16:48	07:47 17:38	06:52 18:25	06:45 20:14	05:49 21:00	05:19 21:35	06:03 (WEA H5) 06:17 (WEA H5)	05:30 21:35	06:06 (WEA H5) 06:27 (WEA H5)	06:10 20:55	06:56 19:52	07:42 18:47
12	08:23 16:49	07:45 17:40	06:50 18:26	06:43 20:15	05:48 21:01	05:19 21:36	06:04 (WEA H5) 06:17 (WEA H5)	05:31 21:34	06:06 (WEA H5) 06:28 (WEA H5)	06:12 20:53	06:58 19:50	07:43 18:45
13	08:22 16:50	07:43 17:41	06:48 18:28	06:41 20:17	05:46 21:03	05:18 21:37	06:11 (WEA H5) 06:13 (WEA H5)	05:32 21:34	06:06 (WEA H5) 06:28 (WEA H5)	06:13 20:51	06:59 19:48	07:45 18:43
14	08:22 16:52	07:42 17:43	06:46 18:30	06:39 20:18	05:45 21:04	05:18 21:37	06:09 (WEA H5) 06:14 (WEA H5)	05:33 21:33	06:06 (WEA H5) 06:28 (WEA H5)	06:14 20:49	07:01 19:45	07:46 18:41
15	08:21 16:53	07:40 17:45	06:43 18:31	06:37 20:20	05:43 21:06	05:18 21:38	06:08 (WEA H5) 06:16 (WEA H5)	05:34 21:32	06:05 (WEA H5) 06:29 (WEA H5)	06:16 20:48	07:02 19:43	07:48 18:38
16	08:20 16:55	07:38 17:46	06:41 18:33	06:35 20:22	05:42 21:07	05:18 21:38	06:07 (WEA H5) 06:17 (WEA H5)	05:35 21:31	06:05 (WEA H5) 06:29 (WEA H5)	06:17 20:46	07:04 19:41	07:50 18:36
17	08:19 16:56	07:36 17:48	06:39 18:34	06:33 20:23	05:40 21:08	05:18 21:39	06:06 (WEA H5) 06:17 (WEA H5)	05:37 21:30	06:05 (WEA H5) 06:29 (WEA H5)	06:19 20:44	07:05 19:39	07:51 18:34
18	08:18 16:58	07:34 17:50	06:37 18:36	06:31 20:25	05:39 21:10	05:18 21:39	06:04 (WEA H5) 06:17 (WEA H5)	05:38 21:29	06:06 (WEA H5) 06:29 (WEA H5)	06:20 20:42	07:07 19:37	07:53 18:32
19	08:18 16:59	07:32 17:52	06:35 18:38	06:29 20:26	05:38 21:11	05:18 21:40	06:03 (WEA H5) 06:15 (WEA H5)	05:39 21:28	06:07 (WEA H5) 06:29 (WEA H5)	06:22 20:40	07:08 19:34	07:54 18:30
20	08:17 17:01	07:31 17:53	06:33 18:39	06:27 20:28	05:37 21:12	05:18 21:40	06:02 (WEA H5) 06:16 (WEA H5)	05:38 21:27	06:08 (WEA H5) 06:29 (WEA H5)	06:23 20:38	07:09 19:32	07:56 18:28
21	08:16 17:02	07:29 17:55	06:30 18:41	06:25 20:29	05:35 21:14	05:18 21:40	06:01 (WEA H5) 06:16 (WEA H5)	05:41 21:26	06:09 (WEA H5) 06:29 (WEA H5)	06:25 20:36	07:11 19:30	07:58 18:26
22	08:15 17:04	07:27 17:57	06:28 18:42	06:23 20:31	05:34 21:15	05:19 21:40	06:00 (WEA H5) 06:16 (WEA H5)	05:42 21:25	06:10 (WEA H5) 06:29 (WEA H5)	06:26 20:34	07:12 19:28	07:59 18:25
23	08:14 17:06	07:25 17:58	06:26 18:44	06:21 20:32	05:33 21:16	05:19 21:40	06:08 (WEA H5) 06:16 (WEA H5)	05:44 21:24	06:12 (WEA H5) 06:29 (WEA H5)	06:28 20:32	07:14 19:26	08:01 18:23
24	08:12 17:07	07:23 18:00	06:24 18:46	06:19 20:34	05:32 21:18	05:19 21:41	06:13 (WEA H5) 06:17 (WEA H5)	05:45 21:22	06:13 (WEA H5) 06:29 (WEA H5)	06:29 20:30	07:15 19:23	08:02 18:21
25	08:11 17:09	07:21 18:02	06:22 18:47	06:17 20:36	05:31 21:19	05:19 21:41	06:08 (WEA H5) 06:18 (WEA H5)	05:46 21:21	06:14 (WEA H5) 06:28 (WEA H5)	06:31 20:28	07:17 19:21	07:04 18:19
26	08:10 17:11	07:19 18:03	06:19 18:49	06:15 20:37	05:30 21:20	05:20 21:41	06:08 (WEA H5) 06:18 (WEA H5)	05:48 21:20	06:15 (WEA H5) 06:28 (WEA H5)	06:32 20:26	07:19 19:19	07:06 18:17
27	08:09 17:12	07:17 18:05	06:17 18:50	06:13 20:39	05:29 21:21	05:20 21:41	06:08 (WEA H5) 06:19 (WEA H5)	05:49 21:18	06:16 (WEA H5) 06:27 (WEA H5)	06:34 20:24	07:20 19:17	07:07 18:15
28	08:08 17:14	07:15 18:07	06:15 18:52	06:11 20:40	05:28 21:22	05:21 21:41	06:08 (WEA H5) 06:19 (WEA H5)	05:50 21:17	06:19 (WEA H5) 06:27 (WEA H5)	06:35 20:22	07:22 19:15	07:09 18:13
29	08:06 17:16		07:13 19:53	06:09 20:42	05:27 21:24	05:21 21:40	06:08 (WEA H5) 06:20 (WEA H5)	05:52 21:16	06:19 (WEA H5) 06:20 (WEA H5)	06:37 20:20	07:23 19:12	07:11 18:00
30	08:05 17:17		07:11 19:55	06:08 20:43	05:26 21:25	05:22 21:40	06:07 (WEA H5) 06:20 (WEA H5)	05:53 21:14	06:20 (WEA H5) 06:22 (WEA H5)	06:38 20:18	07:25 19:10	07:12 18:00
31	08:04 17:19		07:09 19:57		05:25 21:26	05:57 (WEA H5) 06:19 (WEA H5)		05:54 21:13	06:22 (WEA H5) 06:23 (WEA H5)	06:40 20:16		07:14 17:08
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	254
astr.max.mögl.Beschattung					323	388	527					
Red.Sonnenscheinwahrsch.					0,45	0,38	0,46					
Reduktion Betriebsdauer					0,92	0,92	0,92					
Reduktion Windrichtung					0,71	0,71	0,71					
Gesamte Reduktion					0,29	0,25	0,30					
Met.wahrsch.Beschattung					95	97	159					

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 03 - Mainz-Marienborn, Klein-Winternheimer-Str. 19
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1 08:26	08:02	08:47 (WEA H5)	07:13	07:06	06:06	05:24	05:22	05:56	06:41	07:26	07:16	08:03
2 16:36	17:21	09:09 (WEA H5)	18:08	19:58	20:45	21:27	21:40	21:11	20:14	19:08	17:06	16:29
3 08:26	08:01	08:49 (WEA H5)	07:11	07:04	06:04	05:24	05:23	05:57	06:43	07:28	07:17	08:04
4 16:37	17:22	09:09 (WEA H5)	18:10	20:00	20:46	21:28	21:40	21:10	20:11	19:06	17:04	16:29
5 08:26	08:00	08:49 (WEA H5)	07:09	07:02	06:02	05:23	05:23	05:58	06:44	07:29	07:19	08:06
6 16:38	17:24	09:07 (WEA H5)	18:12	20:01	20:48	21:29	21:40	21:08	20:09	19:04	17:03	16:28
7 08:26	07:58	08:50 (WEA H5)	07:07	07:00	06:01	05:22	05:24	06:00	06:46	07:31	07:21	08:07
8 16:39	17:26	09:06 (WEA H5)	18:13	20:03	20:49	21:30	21:39	21:07	20:07	19:02	17:01	16:28
9 08:26	07:57	08:53 (WEA H5)	07:05	06:58	05:59	05:22	05:25	06:01	06:47	07:32	07:22	08:08
10 16:40	17:27	09:04 (WEA H5)	18:15	20:04	20:51	21:31	21:39	21:05	20:05	18:59	16:59	08:25 (WEA H5)
11 08:25	07:55	08:57 (WEA H5)	07:03	06:56	05:57	05:21	05:26	06:03	06:49	07:34	07:24	08:10
12 16:41	17:29	09:00 (WEA H5)	18:17	20:06	20:52	21:32	21:38	21:03	20:03	18:57	16:58	08:35 (WEA H5)
13 08:25	07:53		07:00	06:54	05:55	05:21	05:27	06:04	06:50	07:35	07:26	08:21 (WEA H5)
14 16:43	17:31		18:18	20:07	20:54	21:33	21:38	21:02	20:01	18:55	16:56	08:37 (WEA H5)
15 08:25	07:52		06:58	06:51	05:54	05:20	05:27	06:06	06:52	07:37	07:27	08:20 (WEA H5)
16 16:44	17:33		18:20	20:09	20:55	21:33	21:37	21:00	19:59	18:53	16:55	08:38 (WEA H5)
17 08:24	07:50		06:56	06:49	05:52	05:20	05:28	06:07	06:53	07:38	07:29	08:19 (WEA H5)
18 16:45	17:34		18:22	20:11	20:57	21:34	21:37	20:58	19:56	18:51	16:53	08:38 (WEA H5)
19 08:24	07:48		06:54	06:47	05:51	05:19	05:29	06:09	06:55	07:40	07:31	08:18 (WEA H5)
20 16:46	17:36		18:23	20:12	20:58	21:35	21:36	20:57	19:54	18:49	16:52	08:40 (WEA H5)
21 08:23	07:47		06:52	06:45	05:49	05:19	05:30	06:10	06:56	07:42	07:32	08:18 (WEA H5)
22 16:48	17:38		18:25	20:14	21:00	21:36	21:35	20:55	19:52	18:47	16:50	08:40 (WEA H5)
23 08:23	07:45		06:50	06:43	05:48	05:19	05:31	06:11	06:58	07:43	07:34	08:18 (WEA H5)
24 16:49	17:40		18:26	20:15	21:01	21:36	21:35	20:53	19:50	18:45	16:49	08:41 (WEA H5)
25 08:22	07:43		06:48	06:41	05:46	05:18	05:32	06:13	06:59	07:45	07:36	08:17 (WEA H5)
26 16:50	17:41		18:28	20:17	21:03	21:37	21:34	20:51	19:48	18:43	16:48	08:41 (WEA H5)
27 08:22	07:42	08:52 (WEA H5)	06:46	06:39	05:45	05:18	05:33	06:14	07:01	07:46	07:37	08:17 (WEA H5)
28 16:52	3 08:55 (WEA H5)	17:43	18:30	20:18	21:04	21:37	21:33	20:49	19:45	18:40	16:46	08:41 (WEA H5)
29 08:21	08:49 (WEA H5)	07:40	06:43	06:37	05:43	05:18	05:34	06:16	07:02	07:48	07:39	08:18 (WEA H5)
30 16:53	9 08:58 (WEA H5)	17:45	18:31	20:20	21:06	21:38	21:32	20:48	19:43	18:38	16:45	08:42 (WEA H5)
31 08:20	08:48 (WEA H5)	07:38	06:41	06:35	05:42	05:18	05:35	06:17	07:04	07:50	07:40	08:18 (WEA H5)
32 16:55	12 09:00 (WEA H5)	17:46	18:33	20:22	21:07	21:38	21:31	20:46	19:41	18:36	16:44	08:42 (WEA H5)
33 08:19	08:47 (WEA H5)	07:36	06:39	06:33	05:40	05:18	05:36	06:19	07:05	07:51	07:42	08:19 (WEA H5)
34 16:56	15 09:02 (WEA H5)	17:48	18:34	20:23	21:08	21:39	21:30	20:44	19:39	18:34	16:42	08:43 (WEA H5)
35 08:18	08:46 (WEA H5)	07:34	06:37	06:31	05:39	05:18	05:38	06:20	07:06	07:53	07:44	08:18 (WEA H5)
36 16:58	17 09:03 (WEA H5)	17:50	18:36	20:25	21:10	21:39	21:29	20:42	19:37	18:32	16:41	08:42 (WEA H5)
37 08:18	08:46 (WEA H5)	07:32	06:35	06:29	05:38	05:18	05:39	06:22	07:08	07:54	07:45	08:19 (WEA H5)
38 16:59	18 09:04 (WEA H5)	17:52	18:38	20:26	21:11	21:40	21:28	20:40	19:34	18:30	16:40	08:42 (WEA H5)
39 08:17	08:45 (WEA H5)	07:31	06:33	06:27	05:37	05:18	05:40	06:23	07:09	07:56	07:47	08:20 (WEA H5)
40 17:01	20 09:05 (WEA H5)	17:53	18:39	20:28	21:13	21:40	21:27	20:38	19:32	18:28	16:39	08:42 (WEA H5)
41 08:16	08:45 (WEA H5)	07:29	06:30	06:25	05:35	05:18	05:41	06:25	07:11	07:58	07:48	08:20 (WEA H5)
42 17:02	21 09:06 (WEA H5)	17:55	18:41	20:29	21:14	21:40	21:26	20:36	19:30	18:26	16:38	08:41 (WEA H5)
43 08:15	08:45 (WEA H5)	07:27	06:28	06:23	05:34	05:18	05:42	06:26	07:12	07:59	07:50	08:21 (WEA H5)
44 17:04	22 09:07 (WEA H5)	17:57	18:42	20:31	21:15	21:40	21:25	20:34	19:28	18:24	16:37	08:41 (WEA H5)
45 08:14	08:44 (WEA H5)	07:25	06:26	06:21	05:33	05:19	05:44	06:28	07:14	08:01	07:51	08:23 (WEA H5)
46 17:06	23 09:07 (WEA H5)	17:58	18:44	20:32	21:16	21:41	21:24	20:32	19:26	18:23	16:36	08:41 (WEA H5)
47 08:13	08:44 (WEA H5)	07:23	06:24	06:19	05:32	05:19	05:45	06:29	07:15	08:02	07:53	08:23 (WEA H5)
48 17:07	24 09:08 (WEA H5)	18:00	18:45	20:34	21:18	21:41	21:22	20:30	19:23	18:21	16:35	08:40 (WEA H5)
49 08:11	08:45 (WEA H5)	07:21	06:22	06:17	05:31	05:19	05:46	06:31	07:17	08:04	07:54	08:25 (WEA H5)
50 17:09	24 09:09 (WEA H5)	18:02	18:47	20:36	21:19	21:41	21:21	20:28	19:21	18:19	16:34	08:40 (WEA H5)
51 08:10	08:45 (WEA H5)	07:19	06:19	06:15	05:30	05:20	05:48	06:32	07:19	07:06	07:56	08:26 (WEA H5)
52 17:10	24 09:09 (WEA H5)	18:03	18:49	20:37	21:20	21:41	21:20	20:26	19:19	17:17	16:33	08:38 (WEA H5)
53 08:09	08:45 (WEA H5)	07:17	06:17	06:13	05:29	05:20	05:49	06:34	07:20	07:07	07:57	08:28 (WEA H5)
54 17:12	24 09:09 (WEA H5)	18:05	18:50	20:39	21:21	21:41	21:19	20:24	19:17	17:15	16:32	08:37 (WEA H5)
55 08:08	08:45 (WEA H5)	07:15	06:15	06:11	05:28	05:21	05:50	06:35	07:22	07:09	07:59	08:32 (WEA H5)
56 17:14	24 09:09 (WEA H5)	18:07	18:52	20:40	21:22	21:41	21:17	20:22	19:15	17:13	16:31	08:35 (WEA H5)
57 08:06	08:46 (WEA H5)		07:13	06:09	05:27	05:21	05:52	06:37	07:23	07:11	08:00	08:26
58 17:15	24 09:10 (WEA H5)		19:53	20:42	21:24	21:41	21:16	20:20	19:12	17:11	16:31	16:33
59 08:05	08:46 (WEA H5)		07:11	06:08	05:26	05:22	05:53	06:38	07:25	07:12	08:02	08:26
60 17:17	23 09:09 (WEA H5)		19:55	20:43	21:25	21:40	21:14	20:18	19:10	17:10	16:30	16:34
61 08:04	08:47 (WEA H5)		07:09		05:25		05:54	06:40		07:14		08:26
62 17:19	23 09:10 (WEA H5)		19:57		21:26		21:13	20:16		17:08		16:35
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	253
astr.max.mögl.Beschattung	350	90									442	
Red.Sonnenscheinwahrsch.	0,17	0,29									0,20	
Reduktion Betriebsdauer	0,92	0,92									0,92	
Reduktion Windrichtung	0,54	0,54									0,54	
Gesamte Reduktion	0,09	0,14									0,10	
Met.wahrsch.Beschattung	30	13									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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
	Minuten mit Schatten	

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 04 - Mainz-Marienborn, Altkönigstr. 70
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1 08:26	09:07 (WEA H5)	08:02	07:13	07:06	06:06	05:24	05:22	05:56	06:41	07:26	07:16	08:03
2 16:36	09:36 (WEA H5)	17:21	18:08	19:58	20:45	21:27	21:40	21:11	20:13	19:08	17:06	16:29
3 08:26	09:08 (WEA H5)	08:01	07:11	07:04	06:04	05:24	05:23	05:57	06:43	07:28	07:17	08:04
4 16:37	09:37 (WEA H5)	17:22	18:10	20:00	20:46	21:28	21:40	21:10	20:11	19:06	17:04	16:29
5 08:26	09:09 (WEA H5)	07:59	07:09	07:02	06:02	05:23	05:23	05:58	06:44	07:29	07:19	08:06
6 16:38	09:38 (WEA H5)	17:24	18:12	20:01	20:48	21:29	21:40	21:08	20:09	19:04	17:03	16:28
7 08:26	09:08 (WEA H5)	07:58	07:07	07:00	06:01	05:22	05:24	06:00	06:46	07:31	07:21	08:07
8 16:39	09:37 (WEA H5)	17:26	18:13	20:03	20:49	21:30	21:39	21:07	20:07	19:02	17:01	16:28
9 08:26	09:09 (WEA H5)	07:56	07:05	06:58	05:59	05:22	05:25	06:01	06:47	07:32	07:22	08:08
10 16:40	09:38 (WEA H5)	17:27	18:15	20:04	20:51	21:31	21:39	21:05	20:05	18:59	16:59	16:27
11 08:25	09:10 (WEA H5)	07:55	07:02	06:56	05:57	05:21	05:26	06:03	06:49	07:34	07:24	08:09
12 16:41	09:39 (WEA H5)	17:29	18:17	20:06	20:52	21:32	21:38	21:03	20:03	18:57	16:58	16:27
13 08:25	09:10 (WEA H5)	07:53	07:00	06:54	05:55	05:21	05:26	06:04	06:50	07:35	07:26	08:11
14 16:42	09:39 (WEA H5)	17:31	18:18	20:07	20:54	21:33	21:38	21:02	20:01	18:55	16:56	16:27
15 08:25	09:11 (WEA H5)	07:52	06:58	06:51	05:54	05:20	05:27	06:06	06:52	07:37	07:27	08:12
16 16:44	09:40 (WEA H5)	17:33	18:20	20:09	20:55	21:33	21:37	21:00	19:58	18:53	16:55	16:26
17 08:24	09:11 (WEA H5)	07:50	06:56	06:49	05:52	05:20	05:28	06:07	06:53	07:38	07:29	08:13
18 16:45	09:40 (WEA H5)	17:34	18:21	20:11	20:57	21:34	21:37	20:58	19:56	18:51	16:53	16:26
19 08:24	09:12 (WEA H5)	07:48	06:54	06:47	05:51	05:19	05:29	06:09	06:55	07:40	07:31	08:14
20 16:46	09:41 (WEA H5)	17:36	18:23	20:12	20:58	21:35	21:36	20:57	19:54	18:49	16:52	16:26
21 08:23	09:12 (WEA H5)	07:47	06:52	06:45	05:49	05:19	05:30	06:10	06:56	07:42	07:32	08:15
22 16:48	09:41 (WEA H5)	17:38	18:25	20:14	21:00	21:36	21:35	20:55	19:52	18:47	16:50	16:26
23 08:23	09:12 (WEA H5)	07:45	06:50	06:43	05:48	05:19	05:31	06:11	06:58	07:43	07:34	08:16
24 16:49	09:41 (WEA H5)	17:39	18:26	20:15	21:01	21:36	21:35	20:53	19:50	18:45	16:49	16:26
25 08:22	09:13 (WEA H5)	07:43	06:48	06:41	05:46	05:18	05:32	06:13	06:59	07:45	07:36	08:17
26 16:50	09:42 (WEA H5)	17:41	18:28	20:17	21:03	21:37	21:34	20:51	19:48	18:43	16:47	16:26
27 08:22	09:14 (WEA H5)	07:42	06:46	06:39	05:45	05:18	05:33	06:14	07:01	07:46	07:37	08:18
28 16:52	09:41 (WEA H5)	17:43	18:30	20:18	21:04	21:37	21:33	20:49	19:45	18:40	16:46	16:26
29 08:21	09:14 (WEA H5)	07:40	06:43	06:37	05:43	05:18	05:34	06:16	07:02	07:48	07:39	08:19
30 16:53	09:41 (WEA H5)	17:45	18:31	20:20	21:06	21:38	21:32	20:48	19:43	18:38	16:45	16:26
31 08:20	09:15 (WEA H5)	07:38	06:41	06:35	05:42	05:18	05:35	06:17	07:03	07:50	07:40	08:19
32 16:55	09:41 (WEA H5)	17:46	18:33	20:22	21:07	21:38	21:31	20:46	19:41	18:36	16:44	16:26
33 08:19	09:16 (WEA H5)	07:36	06:39	06:33	05:40	05:18	05:36	06:19	07:05	07:51	07:42	08:20
34 16:56	09:41 (WEA H5)	17:48	18:34	20:23	21:08	21:39	21:30	20:44	19:39	18:34	16:42	16:26
35 08:18	09:16 (WEA H5)	07:34	06:37	06:31	05:39	05:18	05:38	06:20	07:06	07:53	07:44	08:21
36 16:58	09:41 (WEA H5)	17:50	18:36	20:25	21:10	21:39	21:29	20:42	19:37	18:32	16:41	16:26
37 08:18	09:17 (WEA H5)	07:32	06:35	06:29	05:38	05:18	05:39	06:22	07:08	07:54	07:45	08:22
38 16:59	09:41 (WEA H5)	17:51	18:38	20:26	21:11	21:40	21:28	20:40	19:34	18:30	16:40	16:26
39 08:17	09:19 (WEA H5)	07:31	06:33	06:27	05:36	05:18	05:40	06:23	07:09	07:56	07:47	08:22
40 17:01	09:40 (WEA H5)	17:53	18:39	20:28	21:12	21:40	21:27	20:38	19:32	18:28	16:39	16:27
41 08:16	09:20 (WEA H5)	07:29	06:30	06:25	05:35	05:18	05:41	06:25	07:11	07:58	07:48	08:23
42 17:02	09:40 (WEA H5)	17:55	18:41	20:29	21:14	21:40	21:26	20:36	19:30	18:26	16:38	16:28
43 08:15	09:21 (WEA H5)	07:27	06:28	06:23	05:34	05:18	05:42	06:26	07:12	07:59	07:50	08:23
44 17:04	09:39 (WEA H5)	17:57	18:42	20:31	21:15	21:40	21:25	20:34	19:28	18:24	16:37	16:28
45 08:14	09:22 (WEA H5)	07:25	06:26	06:21	05:33	05:19	05:44	06:28	07:14	08:01	07:51	08:24
46 17:06	09:37 (WEA H5)	17:58	18:44	20:32	21:16	21:41	21:24	20:32	19:26	18:23	16:36	16:29
47 08:13	09:25 (WEA H5)	07:23	06:24	06:19	05:32	05:19	05:45	06:29	07:15	08:02	07:53	08:24
48 17:07	09:35 (WEA H5)	18:00	18:45	20:34	21:18	21:41	21:22	20:30	19:23	18:21	16:35	16:29
49 08:11		07:21	06:22	06:17	05:31	05:19	05:46	06:31	07:17	07:04	07:54	08:25
50 17:09		18:02	18:47	20:36	21:19	21:41	21:21	20:28	19:21	17:19	16:34	16:30
51 08:10		07:19	06:19	06:15	05:30	05:20	05:48	06:32	07:18	07:06	07:56	08:25
52 17:10		18:03	18:49	20:37	21:20	21:41	21:20	20:26	19:19	17:17	16:33	16:31
53 08:09		07:17	06:17	06:13	05:29	05:20	05:49	06:34	07:20	07:07	07:57	08:25
54 17:12		18:05	18:50	20:39	21:21	21:41	21:18	20:24	19:17	17:15	16:32	16:31
55 08:08		07:15	06:15	06:11	05:28	05:20	05:50	06:35	07:22	07:09	07:59	08:26
56 17:14		18:07	18:52	20:40	21:22	21:41	21:17	20:22	19:15	17:13	16:31	16:32
57 08:06			07:13	06:09	05:27	05:21	05:52	06:37	07:23	07:11	08:00	08:26
58 17:15			19:53	20:42	21:24	21:40	21:16	20:20	19:12	17:11	16:31	16:33
59 08:05			07:11	06:08	05:26	05:22	05:53	06:38	07:25	07:12	08:02	08:26
60 17:17			19:55	20:43	21:25	21:40	21:14	20:18	19:10	17:10	16:30	16:34
61 08:04			07:09		05:25		05:54	06:40		07:14		08:26
62 17:19			19:56		21:26		21:13	20:16		17:08		16:35
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	253
astr.max.mögl.Beschattung	615										295	882
Red.Sonnenscheinwahrsch.	0,17										0,20	0,15
Reduktion Betriebsdauer	0,92										0,92	0,92
Reduktion Windrichtung	0,53										0,53	0,53
Gesamte Reduktion	0,08										0,10	0,07
Met.wahrsch.Beschattung	51										29	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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 05 - Mainz-Marienborn, Hinter dem Chaussee-Haus
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember	
1	08:26 16:36	10:19 (WEA H5) 10:39 (WEA H5)	08:02 17:21	07:13 18:08	07:06 19:58	06:06 20:45	05:24 21:27	05:22 21:40	05:56 21:11	06:41 20:13	07:26 19:08	07:16 17:06	08:03 16:29
2	08:26 16:37	10:20 (WEA H5) 10:39 (WEA H5)	08:01 17:22	07:11 18:10	07:04 20:00	06:04 20:46	05:24 21:28	05:23 21:40	05:57 21:10	06:43 20:11	07:28 19:06	07:17 17:04	08:04 16:29
3	08:26 16:38	10:21 (WEA H5) 10:39 (WEA H5)	07:59 17:24	07:09 18:12	07:02 20:01	06:02 20:48	05:23 21:29	05:23 21:39	05:58 21:08	06:44 20:09	07:29 19:04	07:19 17:03	08:06 16:28
4	08:26 16:39	10:22 (WEA H5) 10:38 (WEA H5)	07:58 17:26	07:07 18:13	07:00 20:03	06:00 20:49	05:22 21:30	05:24 21:39	06:00 21:07	06:46 20:07	07:31 19:02	07:21 17:01	08:07 16:28
5	08:26 16:40	10:24 (WEA H5) 10:37 (WEA H5)	07:56 17:27	07:05 18:15	06:58 20:04	05:59 20:51	05:22 21:31	05:25 21:39	06:01 21:05	06:47 20:05	07:32 18:59	07:22 16:59	08:08 16:27
6	08:25 16:41	10:26 (WEA H5) 10:36 (WEA H5)	07:55 17:29	07:02 18:17	06:56 20:06	05:57 20:52	05:21 21:32	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57	07:24 16:58	08:09 16:27
7	08:25 16:42	10:29 (WEA H5) 10:33 (WEA H5)	07:53 17:31	07:00 18:18	06:54 20:07	05:55 20:54	05:20 21:32	05:26 21:38	06:04 21:02	06:50 20:01	07:35 18:55	07:26 16:56	08:11 16:27
8	08:25 16:44	10:33 (WEA H5) 17:33	07:52 18:20	06:58 20:09	06:51 20:55	05:54 20:52	05:20 21:33	05:27 21:37	06:06 21:00	06:52 19:58	07:37 18:53	07:27 16:55	08:12 16:26
9	08:24 16:45	10:37 (WEA H5) 17:34	07:50 18:21	06:56 20:11	06:49 20:57	05:52 20:54	05:20 21:34	05:28 21:37	06:07 20:58	06:53 19:56	07:38 18:51	07:29 16:53	08:13 16:26
10	08:24 16:46	10:38 (WEA H5) 17:35	07:48 18:22	06:54 20:12	06:47 20:58	05:51 20:55	05:19 21:35	05:29 21:36	06:09 20:57	06:55 19:54	07:40 18:49	07:31 16:52	08:14 16:26
11	08:23 16:48	10:39 (WEA H5) 17:36	07:47 18:23	06:52 20:13	06:45 20:59	05:49 20:56	05:19 21:36	05:30 21:35	06:10 20:55	06:56 19:52	07:42 18:47	07:32 16:50	08:15 16:26
12	08:23 16:49	10:40 (WEA H5) 17:37	07:45 18:24	06:50 20:14	06:43 21:00	05:48 20:56	05:19 21:36	05:31 21:35	06:11 20:53	06:58 19:50	07:43 18:45	07:34 16:49	08:16 16:26
13	08:22 16:50	10:41 (WEA H5) 17:38	07:43 18:25	06:48 20:15	06:41 21:01	05:46 20:56	05:18 21:36	05:32 21:35	06:13 20:53	06:59 19:48	07:45 18:42	07:35 16:47	08:17 16:26
14	08:22 16:51	10:42 (WEA H5) 17:39	07:42 18:26	06:45 20:16	06:39 21:02	05:45 20:57	05:18 21:37	05:33 21:34	06:14 20:51	07:00 19:48	07:46 18:42	07:37 16:47	08:18 16:26
15	08:21 16:52	10:43 (WEA H5) 17:40	07:41 18:27	06:43 20:17	06:37 21:03	05:43 20:58	05:18 21:37	05:34 21:33	06:16 20:49	07:02 19:45	07:48 18:40	07:39 16:46	08:19 16:26
16	08:20 16:53	10:44 (WEA H5) 17:41	07:40 18:28	06:41 20:18	06:35 21:04	05:42 20:59	05:18 21:38	05:35 21:32	06:17 20:47	07:03 19:43	07:49 18:38	07:40 16:45	08:19 16:26
17	08:19 16:54	10:45 (WEA H5) 17:42	07:38 18:29	06:39 20:19	06:33 21:05	05:40 20:59	05:18 21:39	05:36 21:30	06:19 20:44	07:05 19:39	07:51 18:34	07:42 16:42	08:20 16:26
18	08:18 16:55	10:46 (WEA H5) 17:43	07:36 18:30	06:37 20:20	06:31 21:06	05:39 20:59	05:18 21:40	05:38 21:30	06:20 20:44	07:06 19:39	07:53 18:34	07:44 16:42	08:21 16:26
19	08:18 16:56	10:47 (WEA H5) 17:44	07:34 18:31	06:35 20:21	06:29 21:07	05:38 20:59	05:18 21:41	05:39 21:30	06:22 20:44	07:08 19:37	07:54 18:32	07:45 16:41	08:22 16:27
20	08:17 17:01	10:48 (WEA H5) 17:45	07:32 18:32	06:35 20:22	06:29 21:08	05:38 20:59	05:18 21:42	05:39 21:30	06:22 20:44	07:08 19:37	07:54 18:32	07:45 16:41	08:22 16:27
21	08:16 17:02	10:49 (WEA H5) 17:46	07:31 18:33	06:33 20:23	06:27 21:09	05:36 20:58	05:18 21:43	05:40 21:30	06:23 20:44	07:09 19:37	07:55 18:32	07:47 16:41	08:22 16:27
22	08:15 17:03	10:50 (WEA H5) 17:47	07:30 18:34	06:32 20:24	06:26 21:10	05:35 20:57	05:18 21:44	05:41 21:30	06:25 20:44	07:11 19:37	07:58 18:32	07:48 16:41	08:23 16:27
23	08:14 17:04	10:51 (WEA H5) 17:48	07:29 18:35	06:31 20:25	06:25 21:11	05:35 20:57	05:18 21:45	05:41 21:30	06:25 20:44	07:11 19:37	07:58 18:32	07:48 16:41	08:23 16:27
24	08:12 17:05	10:52 (WEA H5) 17:49	07:27 18:36	06:30 20:26	06:24 21:12	05:34 20:57	05:18 21:46	05:42 21:30	06:26 20:44	07:12 19:37	07:59 18:32	07:50 16:41	08:23 16:27
25	08:11 17:06	10:53 (WEA H5) 17:50	07:26 18:37	06:29 20:27	06:23 21:13	05:33 20:57	05:18 21:47	05:42 21:30	06:27 20:44	07:13 19:37	08:01 18:32	07:51 16:41	08:24 16:27
26	08:10 17:07	10:54 (WEA H5) 17:51	07:25 18:38	06:28 20:28	06:22 21:14	05:33 20:57	05:18 21:48	05:42 21:30	06:28 20:44	07:14 19:37	08:02 18:32	07:52 16:41	08:24 16:27
27	08:09 17:08	10:55 (WEA H5) 17:52	07:24 18:39	06:27 20:29	06:21 21:15	05:32 20:57	05:18 21:49	05:42 21:30	06:29 20:44	07:15 19:37	08:03 18:32	07:53 16:41	08:24 16:27
28	08:08 17:09	10:56 (WEA H5) 17:53	07:23 18:40	06:26 20:30	06:20 21:16	05:31 20:57	05:19 21:50	05:42 21:30	06:30 20:44	07:16 19:37	08:04 18:32	07:54 16:41	08:25 16:27
29	08:07 17:10	10:57 (WEA H5) 17:54	07:22 18:41	06:25 20:31	06:19 21:17	05:30 20:57	05:19 21:51	05:42 21:30	06:31 20:44	07:17 19:37	08:05 18:32	07:55 16:41	08:25 16:27
30	08:06 17:11	10:58 (WEA H5) 17:55	07:21 18:42	06:24 20:32	06:18 21:18	05:29 20:57	05:19 21:52	05:42 21:30	06:32 20:44	07:18 19:37	08:06 18:32	07:56 16:41	08:25 16:27
31	08:04 17:12	10:59 (WEA H5) 17:56	07:20 18:43	06:23 20:33	06:17 21:19	05:28 20:57	05:19 21:53	05:42 21:30	06:33 20:44	07:19 19:37	08:07 18:32	07:57 16:41	08:25 16:27
Sonnenscheinstunden	267		282	368	412	477	488	492	448	380	334	273	253
astr.max.mögl.Beschattung	100												584
Red.Sonnenscheinwahrsch.	0,17												0,15
Reduktion Betriebsdauer	0,92												0,92
Reduktion Windrichtung	0,57												0,57
Gesamte Reduktion	0,09												0,08
Met.wahrsch.Beschattung	9												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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 06 - Mainz-Hechtsheim, Adam-Opel-Str. 5
 Voraussetzungen für Berechnung des Schattenwurfs: Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
 1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
 335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
 Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:26	08:02	15:43 (WEA H5)	07:13	07:06	05:24
	16:36	17:20	16:21 (WEA H5)	18:08	19:58	21:27
2	08:26	08:01	15:43 (WEA H5)	07:11	07:04	05:23
	16:37	17:22	16:21 (WEA H5)	18:10	20:00	21:28
3	08:26	07:59	15:43 (WEA H5)	07:09	07:02	05:23
	16:38	17:24	16:22 (WEA H5)	18:12	20:01	21:29
4	08:26	07:58	15:43 (WEA H5)	07:07	07:00	05:22
	16:39	17:26	16:22 (WEA H5)	18:13	20:03	21:30
5	08:26	07:56	15:44 (WEA H5)	07:04	06:58	05:22
	16:40	17:27	16:22 (WEA H5)	18:15	20:04	21:31
6	08:25	07:55	15:44 (WEA H5)	07:02	06:56	05:21
	16:41	17:29	16:22 (WEA H5)	18:17	20:06	21:32
7	08:25	07:53	15:44 (WEA H5)	07:00	06:53	05:20
	16:42	17:31	16:21 (WEA H5)	18:18	20:07	21:32
8	08:25	07:52	15:45 (WEA H5)	06:58	06:51	05:20
	16:44	17:32	16:22 (WEA H5)	18:20	20:09	21:33
9	08:24	07:50	15:46 (WEA H5)	06:56	06:49	05:20
	16:45	17:34	16:21 (WEA H5)	18:21	20:11	21:34
10	08:24	07:48	15:46 (WEA H5)	06:54	06:47	05:19
	16:46	17:36	16:20 (WEA H5)	18:23	20:12	21:35
11	08:23	07:47	15:47 (WEA H5)	06:52	06:45	05:19
	16:48	17:38	16:19 (WEA H5)	18:25	20:14	21:35
12	08:23	07:45	15:49 (WEA H5)	06:50	06:43	05:19
	16:49	17:39	16:19 (WEA H5)	18:26	20:15	21:36
13	08:22	07:43	15:50 (WEA H5)	06:48	06:41	05:18
	16:50	17:41	16:18 (WEA H5)	18:28	20:17	21:37
14	08:21	07:41	15:52 (WEA H5)	06:45	06:39	05:18
	16:52	17:43	16:16 (WEA H5)	18:29	20:18	21:37
15	08:21	15:57 (WEA H5)	07:40	15:53 (WEA H5)	06:37	05:43
	16:53	15:59 (WEA H5)	17:45	16:14 (WEA H5)	18:31	20:20
16	08:20	15:52 (WEA H5)	07:38	15:56 (WEA H5)	06:41	05:42
	16:55	16:04 (WEA H5)	17:46	16:12 (WEA H5)	18:33	20:21
17	08:19	15:51 (WEA H5)	07:36	16:01 (WEA H5)	06:39	05:40
	16:56	16:06 (WEA H5)	17:48	16:07 (WEA H5)	18:34	20:23
18	08:18	15:49 (WEA H5)	07:34		06:37	05:39
	16:58	16:08 (WEA H5)	17:50		18:36	20:25
19	08:17	15:48 (WEA H5)	07:32		06:35	05:38
	16:59	16:10 (WEA H5)	17:51		18:37	20:26
20	08:17	15:47 (WEA H5)	07:30		06:32	05:36
	17:01	16:12 (WEA H5)	17:53		18:39	20:28
21	08:16	15:47 (WEA H5)	07:29		06:30	05:35
	17:02	16:13 (WEA H5)	17:55		18:41	20:29
22	08:15	15:46 (WEA H5)	07:27		06:28	05:34
	17:04	16:15 (WEA H5)	17:56		18:42	20:31
23	08:14	15:45 (WEA H5)	07:25		06:26	05:33
	17:05	16:15 (WEA H5)	17:58		18:44	20:32
24	08:12	15:45 (WEA H5)	07:23		06:24	05:32
	17:07	16:16 (WEA H5)	18:00		18:45	20:34
25	08:11	15:44 (WEA H5)	07:21		06:22	05:31
	17:09	16:17 (WEA H5)	18:02		18:47	20:35
26	08:10	15:44 (WEA H5)	07:19		06:19	05:30
	17:10	16:19 (WEA H5)	18:03		18:49	20:37
27	08:09	15:43 (WEA H5)	07:17		06:17	05:29
	17:12	16:19 (WEA H5)	18:05		18:50	20:39
28	08:08	15:44 (WEA H5)	07:15		06:15	05:28
	17:14	16:20 (WEA H5)	18:07		18:52	20:40
29	08:06	15:43 (WEA H5)			07:13	06:09
	17:15	16:20 (WEA H5)			19:53	20:42
30	08:05	15:43 (WEA H5)			07:11	06:08
	17:17	16:21 (WEA H5)			19:55	20:43
31	08:04	15:43 (WEA H5)			07:09	05:25
	17:19	16:21 (WEA H5)			19:56	21:26
Sonnenscheinstunden	267	282	368	412	477	488
astr.max.mögl.Beschattung	464	530				
Red.Sonnenscheinwahrsch.	0,17	0,29				
Reduktion Betriebsdauer	0,92	0,92				
Reduktion Windrichtung	0,72	0,72				
Gesamte Reduktion	0,11	0,19				
Met.wahrsch.Beschattung	53	102				

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

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

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 06 - Mainz-Hechtsheim, Adam-Opel-Str. 5
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
335	502	703	682	487	528	701	1.072	1.337	901	465	321	8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Jul	August	September	Oktober	November	Dezember	
1	05:22 21:40	05:56 21:11	06:41 20:13	07:26 19:08	07:16 17:06	15:16 (WEA H5) 15:50 (WEA H5)	08:03 16:29
2	05:23 21:40	05:57 21:10	06:43 20:11	07:28 19:06	07:17 17:04	15:15 (WEA H5) 15:51 (WEA H5)	08:04 16:29
3	05:23 21:39	05:58 21:08	06:44 20:09	07:29 19:04	07:19 17:03	15:14 (WEA H5) 15:51 (WEA H5)	08:06 16:28
4	05:24 21:39	06:00 21:07	06:46 20:07	07:31 19:01	07:21 17:01	15:14 (WEA H5) 15:51 (WEA H5)	08:07 16:28
5	05:25 21:39	06:01 21:05	06:47 20:05	07:32 18:59	07:22 16:59	15:14 (WEA H5) 15:52 (WEA H5)	08:08 16:27
6	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57	07:24 16:58	15:14 (WEA H5) 15:52 (WEA H5)	08:09 16:27
7	05:26 21:38	06:04 21:02	06:50 20:01	07:35 18:55	07:26 16:56	15:14 (WEA H5) 15:53 (WEA H5)	08:10 16:27
8	05:27 21:37	06:06 21:00	06:52 19:58	07:37 18:53	07:27 16:55	15:13 (WEA H5) 15:52 (WEA H5)	08:12 16:26
9	05:28 21:37	06:07 20:58	06:53 19:56	07:38 18:51	07:29 16:53	15:13 (WEA H5) 15:52 (WEA H5)	08:13 16:26
10	05:29 21:36	06:08 20:56	06:54 19:54	07:40 18:49	07:30 16:52	15:14 (WEA H5) 15:52 (WEA H5)	08:14 16:26
11	05:30 21:35	06:10 20:55	06:56 19:52	07:41 18:47	07:32 16:50	15:14 (WEA H5) 15:52 (WEA H5)	08:15 16:26
12	05:31 21:34	06:11 20:53	06:57 19:50	07:43 18:45	07:34 16:49	15:15 (WEA H5) 15:53 (WEA H5)	08:16 16:26
13	05:32 21:34	06:13 20:51	06:59 19:47	07:45 18:42	07:35 16:47	15:15 (WEA H5) 15:52 (WEA H5)	08:17 16:26
14	05:33 21:33	06:14 20:49	07:00 19:45	07:46 18:40	07:37 16:46	15:15 (WEA H5) 15:52 (WEA H5)	08:18 16:26
15	05:34 21:32	06:16 20:47	07:02 19:43	07:48 18:38	07:39 16:45	15:16 (WEA H5) 15:52 (WEA H5)	08:19 16:26
16	05:35 21:31	06:17 20:46	07:03 19:41	07:49 18:36	07:40 16:43	15:17 (WEA H5) 15:51 (WEA H5)	08:19 16:26
17	05:36 21:30	06:19 20:44	07:05 19:39	07:51 18:34	07:42 16:42	15:17 (WEA H5) 15:50 (WEA H5)	08:20 16:26
18	05:37 21:29	06:20 20:42	07:06 19:36	07:53 18:32	07:44 16:41	15:18 (WEA H5) 15:50 (WEA H5)	08:21 16:27
19	05:39 21:28	06:22 20:40	07:08 19:34	07:54 18:30	07:45 16:40	15:20 (WEA H5) 15:50 (WEA H5)	08:22 16:27
20	05:40 21:27	06:23 20:38	07:09 19:32	07:56 18:28	07:47 16:39	15:21 (WEA H5) 15:50 (WEA H5)	08:22 16:27
21	05:41 21:26	06:25 20:36	07:11 19:30	07:57 18:26	07:48 16:38	15:22 (WEA H5) 15:48 (WEA H5)	08:23 16:28
22	05:42 21:25	06:26 20:34	07:12 19:28	07:59 18:24	07:50 16:37	15:23 (WEA H5) 15:48 (WEA H5)	08:23 16:28
23	05:44 21:24	06:28 20:32	07:14 19:25	08:01 18:22	07:51 16:36	15:25 (WEA H5) 15:47 (WEA H5)	08:24 16:29
24	05:45 21:22	06:29 20:30	07:15 19:23	08:02 18:21	07:53 16:35	15:26 (WEA H5) 15:45 (WEA H5)	08:24 16:29
25	05:46 21:21	06:31 20:28	07:17 19:21	08:04 17:19	07:54 16:34	15:29 (WEA H5) 15:44 (WEA H5)	08:25 16:30
26	05:47 21:20	06:32 20:26	07:18 19:19	08:06 17:17	07:56 16:33	15:30 (WEA H5) 15:42 (WEA H5)	08:25 16:30
27	05:49 21:18	06:34 20:24	07:20 19:17	08:07 17:15	07:57 16:32	15:35 (WEA H5) 15:39 (WEA H5)	08:25 16:31
28	05:50 21:17	06:35 20:22	07:21 19:15	08:09 17:13	07:59 16:31		08:26 16:32
29	05:51 21:16	06:37 20:20	07:23 19:12	08:11 17:11	08:00 16:31		08:26 16:33
30	05:53 21:14	06:38 20:18	07:24 19:10	08:12 17:10	08:02 16:30		08:26 16:34
31	05:54 21:13	06:40 20:15		08:14 17:08	15:17 (WEA H5) 15:49 (WEA H5)		08:26 16:35
Sonnenscheinstunden	492	448	380	334	273		253
astr.max.mögl.Beschattung				165	842		
Red.Sonnenscheinwahrsch.				0,26	0,20		
Reduktion Betriebsdauer				0,92	0,92		
Reduktion Windrichtung				0,72	0,72		
Gesamte Reduktion				0,17	0,13		
Met.wahrsch.Beschattung				28	112		

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 07 - Mainz-Hechtsheim, Am Weidezehnten
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe

335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März		April	Mai	Juni	Juli	August	September		Oktober		November	Dezember	
1	08:26	08:02	07:13		07:06	06:06	05:24	05:22	05:56	06:41		07:26		18:11 (WEA H5)	07:15	08:03
	16:36	17:20	18:08		19:58	20:45	21:27	21:40	21:11	20:13		19:08	15	18:26 (WEA H5)	17:06	16:29
2	08:26	08:01	07:11		17:38 (WEA H5)	07:04	06:04	05:23	05:23	05:57	06:43	07:27		18:09 (WEA H5)	07:17	08:04
	16:37	17:22	18:10	7	17:45 (WEA H5)	19:59	20:46	21:28	21:40	21:10	20:11	19:06	17	18:26 (WEA H5)	17:04	16:29
3	08:26	07:59	07:09		17:35 (WEA H5)	07:02	06:02	05:23	05:23	05:58	06:44	07:29		18:08 (WEA H5)	07:19	08:05
	16:38	17:24	18:12	12	17:47 (WEA H5)	20:01	20:48	21:29	21:39	21:08	20:09	19:04	19	18:27 (WEA H5)	17:03	16:28
4	08:26	07:58	07:07		17:33 (WEA H5)	07:00	06:00	05:22	05:24	06:00	06:46	07:31		18:08 (WEA H5)	07:20	08:07
	16:39	17:26	18:13	16	17:49 (WEA H5)	20:03	20:49	21:30	21:39	21:06	20:07	19:01	19	18:27 (WEA H5)	17:01	16:28
5	08:25	07:56	07:04		17:32 (WEA H5)	06:58	05:59	05:21	05:25	06:01	06:47	07:32		18:07 (WEA H5)	07:22	08:08
	16:40	17:27	18:15	18	17:50 (WEA H5)	20:04	20:51	21:31	21:39	21:05	20:05	18:59	20	18:27 (WEA H5)	16:59	16:27
6	08:25	07:55	07:02		17:31 (WEA H5)	06:56	05:57	05:21	05:26	06:03	06:48	07:34		18:07 (WEA H5)	07:24	08:09
	16:41	17:29	18:16	19	17:50 (WEA H5)	20:06	20:52	21:31	21:38	21:03	20:03	18:57	20	18:27 (WEA H5)	16:58	16:27
7	08:25	07:53	07:00		17:30 (WEA H5)	06:53	05:55	05:20	05:26	06:04	06:50	07:35		18:06 (WEA H5)	07:25	08:10
	16:42	17:31	18:18	20	17:50 (WEA H5)	20:07	20:54	21:32	21:38	21:02	20:00	18:55	20	18:26 (WEA H5)	16:56	16:27
8	08:25	07:52	06:58		17:30 (WEA H5)	06:51	05:54	05:20	05:27	06:06	06:51	07:37		18:07 (WEA H5)	07:27	08:12
	16:44	17:32	18:20	20	17:50 (WEA H5)	20:09	20:55	21:33	21:37	21:00	19:58	18:53	18	18:25 (WEA H5)	16:55	16:26
9	08:24	07:50	06:56		17:30 (WEA H5)	06:49	05:52	05:19	05:28	06:07	06:53	07:38		18:08 (WEA H5)	07:29	08:13
	16:45	17:34	18:21	20	17:50 (WEA H5)	20:10	20:57	21:34	21:36	20:58	19:56	18:51	16	18:24 (WEA H5)	16:53	16:26
10	08:24	07:48	06:54		17:30 (WEA H5)	06:47	05:50	05:19	05:29	06:08	06:54	07:40		18:08 (WEA H5)	07:30	08:14
	16:46	17:36	18:23	19	17:49 (WEA H5)	20:12	20:58	21:35	21:36	20:56	19:54	18:49	14	18:22 (WEA H5)	16:52	16:26
11	08:23	07:47	06:52		17:31 (WEA H5)	06:45	05:49	05:19	05:30	06:10	06:56	07:41		18:10 (WEA H5)	07:32	08:15
	16:48	17:38	18:25	17	17:48 (WEA H5)	20:14	21:00	21:35	21:35	20:55	19:52	18:47	10	18:20 (WEA H5)	16:50	16:26
12	08:23	07:45	06:50		17:31 (WEA H5)	06:43	05:47	05:19	05:31	06:11	06:57	07:43		18:07 (WEA H5)	07:34	08:16
	16:49	17:39	18:26	16	17:47 (WEA H5)	20:15	21:01	21:36	21:34	20:53	19:50	18:44		18:09	16:49	16:26
13	08:22	07:43	06:48		17:32 (WEA H5)	06:41	05:46	05:18	05:32	06:13	06:59	07:45		18:07	07:35	08:17
	16:50	17:41	18:28	13	17:45 (WEA H5)	20:17	21:03	21:37	21:34	20:51	19:47	18:42		18:07	16:47	16:26
14	08:21	07:41	06:45		17:35 (WEA H5)	06:39	05:44	05:18	05:33	06:14	07:00	07:46		18:07	07:37	08:18
	16:52	17:43	18:29	7	17:42 (WEA H5)	20:18	21:04	21:37	21:33	20:49	19:45	18:40		18:06	16:46	16:26
15	08:21	07:40	06:43		16:37	05:43	05:18	05:34	06:16	07:02		07:48		18:06	07:39	08:18
	16:53	17:45	18:31		20:20	21:05	21:38	21:32	20:47	19:43		18:38		18:05	16:45	16:26
16	08:20	07:38	06:41		16:35	05:42	05:18	05:35	06:17	07:03		07:49		18:05	07:40	08:19
	16:55	17:46	18:33		20:21	21:07	21:38	21:31	20:45	19:41		18:36		18:04	16:43	16:26
17	08:19	07:36	06:39		16:33	05:40	05:18	05:36	06:19	07:05		07:51		18:04	07:42	08:20
	16:56	17:48	18:34		20:23	21:08	21:39	21:30	20:44	19:39		18:34		18:03	16:42	16:26
18	08:18	07:34	06:37		16:31	05:39	05:18	05:37	06:20	07:06		07:53		18:03	07:43	08:21
	16:58	17:50	18:36		20:25	21:10	21:39	21:29	20:42	19:36		18:32		18:02	16:41	16:26
19	08:17	07:32	06:35		16:29	05:38	05:18	05:39	06:22	07:08		07:54		18:01	07:45	08:21
	16:59	17:51	18:37		20:26	21:11	21:39	21:28	20:40	19:34		18:30		18:00	16:40	16:27
20	08:16	07:30	06:32		16:27	05:36	05:18	05:40	06:23	07:09		07:56		17:59	07:47	08:22
	17:01	17:53	18:39		20:28	21:12	21:40	21:27	20:38	19:32		18:28		18:00	16:39	16:27
21	08:16	07:28	06:30		16:25	05:35	05:18	05:41	06:25	07:11		07:57		17:59	07:48	08:23
	17:02	17:55	18:41		20:29	21:14	21:40	21:26	20:36	19:30		18:26		18:00	16:38	16:28
22	08:15	07:27	06:28		16:23	05:34	05:18	05:42	06:26	07:12		07:59		17:59	07:50	08:23
	17:04	17:56	18:42		20:31	21:15	21:40	21:25	20:34	19:28		18:24		18:00	16:37	16:28
23	08:13	07:25	06:26		16:21	05:33	05:19	05:44	06:28	07:14		08:01		17:59	07:51	08:24
	17:05	17:58	18:44		20:32	21:16	21:40	21:23	20:32	19:25		18:22		18:00	16:36	16:29
24	08:12	07:23	06:24		16:19	05:32	05:19	05:45	06:29	07:15		08:02		17:59	07:53	08:24
	17:07	18:00	18:45		20:34	21:17	21:40	21:22	20:30	19:23		18:20		17:59	16:35	16:29
25	08:11	07:21	06:21		16:17	05:31	05:19	05:46	06:31	07:17		07:04		17:58	07:54	08:25
	17:09	18:02	18:47		20:35	21:19	21:41	21:21	20:28	19:21		17:19		17:57	16:34	16:30
26	08:10	07:19	06:19		16:15	05:30	05:19	05:47	06:32	07:18		07:06		17:56	07:56	08:25
	17:10	18:03	18:48		20:37	21:20	21:41	21:20	20:26	19:19		17:17		17:55	16:33	16:30
27	08:09	07:17	06:17		16:13	05:29	05:20	05:49	06:34	07:20		07:07		17:54	07:57	08:25
	17:12	18:05	18:50		20:38	21:21	21:41	21:18	20:24	19:17		17:15		17:53	16:32	16:31
28	08:08	07:15	06:15		16:11	05:28	05:20	05:50	06:35	07:21		07:09		17:52	07:59	08:25
	17:14	18:07	18:52		20:40	21:22	21:40	21:17	20:22	19:14		17:13		17:51	16:31	16:32
29	08:06		07:13		16:09	05:27	05:21	05:51	06:37	07:23		18:17 (WEA H5)		17:51	08:00	08:26
	17:15		19:53		20:42	21:23	21:40	21:16	20:20	19:12	4	18:21 (WEA H5)		17:51	16:31	16:33
30	08:05		07:11		16:07	05:26	05:21	05:53	06:38	07:24		18:13 (WEA H5)		17:50	08:01	08:26
	17:17		19:55		20:43	21:25	21:40	21:14	20:18	19:10	11	18:24 (WEA H5)		17:09	16:30	16:34
31	08:04		07:08			05:25		05:54	06:40			07:14		17:08		08:26
	17:19		19:56			21:26		21:13	20:15			17:08		17:08		16:35
Sonnenscheinstunden	267	282	368		412	477	488	492	448	380		334		273		253
astr.max.mögl.Beschattung			204								15		188			
Red.Sonnenscheinwahrsch.			0,32								0,40		0,26			
Reduktion Betriebsdauer			0,92								0,92		0,92			
Reduktion Windrichtung			0,67								0,67		0,67			
Gesamte Reduktion			0,20								0,25		0,16			
Met.wahrsch.Beschattung			40								4		30			

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 08 - Mainz-Hechtsheim, Baumschule Fuchs
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

		Januar	Februar	März	April		Mai		Juni	Juli	August		September	Oktober	November	Dezember	
1	08:26	08:02	07:13	07:06		06:06		19:47 (WEA H5)	05:24	05:22	05:56		20:05 (WEA H5)	06:41	07:26	07:15	08:03
	16:36	17:20	18:08	19:58		20:45	24	20:11 (WEA H5)	21:27	21:40	21:11	7	20:12 (WEA H5)	20:13	19:08	17:06	16:29
2	08:26	08:01	07:11	07:04		06:04		19:46 (WEA H5)	05:23	05:23	05:57		20:02 (WEA H5)	06:43	07:27	07:17	08:04
	16:37	17:22	18:10	19:59		20:46	25	20:11 (WEA H5)	21:28	21:40	21:10	12	20:14 (WEA H5)	20:11	19:06	17:04	16:29
3	08:26	07:59	07:09	07:02		06:02		19:46 (WEA H5)	05:23	05:23	05:58		20:00 (WEA H5)	06:44	07:29	07:19	08:05
	16:38	17:24	18:12	20:01		20:48	24	20:10 (WEA H5)	21:29	21:39	21:08	15	20:15 (WEA H5)	20:09	19:04	17:03	16:28
4	08:26	07:58	07:07	07:00		06:00		19:47 (WEA H5)	05:22	05:24	06:00		20:00 (WEA H5)	06:46	07:31	07:20	08:07
	16:39	17:26	18:13	20:03		20:49	23	20:10 (WEA H5)	21:30	21:39	21:06	17	20:17 (WEA H5)	20:07	19:01	17:01	16:28
5	08:25	07:56	07:04	06:58		05:59		19:47 (WEA H5)	05:22	05:25	06:01		19:58 (WEA H5)	06:47	07:32	07:22	08:08
	16:40	17:27	18:15	20:04		20:51	22	20:09 (WEA H5)	21:31	21:39	21:05	20	20:18 (WEA H5)	20:05	18:59	16:59	16:27
6	08:25	07:55	07:02	06:56		05:57		19:48 (WEA H5)	05:21	05:26	06:03		19:57 (WEA H5)	06:49	07:34	07:24	08:09
	16:41	17:29	18:16	20:06		20:52	21	20:09 (WEA H5)	21:31	21:38	21:03	21	20:18 (WEA H5)	20:03	19:17	16:58	16:27
7	08:25	07:53	07:00	06:53		05:55		19:48 (WEA H5)	05:20	05:26	06:04		19:57 (WEA H5)	06:50	07:35	07:25	08:10
	16:42	17:31	18:18	20:07		20:54	20	20:08 (WEA H5)	21:32	21:38	21:02	22	20:19 (WEA H5)	20:01	18:55	16:56	16:27
8	08:25	07:52	06:58	06:51		05:54		19:49 (WEA H5)	05:20	05:27	06:06		19:56 (WEA H5)	06:51	07:37	07:27	08:12
	16:44	17:32	18:20	20:09		20:55	19	20:08 (WEA H5)	21:33	21:37	21:00	23	20:19 (WEA H5)	19:58	18:53	16:55	16:26
9	08:24	07:50	06:56	06:49		05:52		19:50 (WEA H5)	05:20	05:28	06:07		19:56 (WEA H5)	06:53	07:38	07:29	08:13
	16:45	17:34	18:21	20:10		20:57	16	20:06 (WEA H5)	21:34	21:36	20:58	24	20:20 (WEA H5)	19:56	18:51	16:53	16:26
10	08:24	07:48	06:54	06:47		05:51		19:51 (WEA H5)	05:19	05:29	06:08		19:55 (WEA H5)	06:54	07:40	07:30	08:14
	16:46	17:36	18:23	20:12		20:58	14	20:05 (WEA H5)	21:35	21:36	20:56	25	20:20 (WEA H5)	19:54	18:49	16:52	16:26
11	08:23	07:47	06:52	06:45		05:49		19:53 (WEA H5)	05:19	05:30	06:10		19:55 (WEA H5)	06:56	07:41	07:32	08:15
	16:48	17:38	18:25	20:14		21:00	10	20:03 (WEA H5)	21:35	21:35	20:55	24	20:19 (WEA H5)	19:52	18:47	16:50	16:26
12	08:23	07:45	06:50	06:43		05:47		19:56 (WEA H5)	05:19	05:31	06:11		19:55 (WEA H5)	06:57	07:43	07:34	08:16
	16:49	17:39	18:26	20:15		21:01	4	20:00 (WEA H5)	21:36	21:34	20:53	25	20:20 (WEA H5)	19:50	18:44	16:49	16:26
13	08:22	07:43	06:48	06:41		05:46		19:55 (WEA H5)	05:18	05:32	06:13		19:55 (WEA H5)	06:59	07:45	07:35	08:17
	16:50	17:41	18:28	20:17		21:03		21:37	21:34	20:51	20:44		20:19 (WEA H5)	19:47	18:42	16:47	16:26
14	08:21	07:41	06:45	06:39		05:45		05:18	05:33	06:14			19:55 (WEA H5)	07:00	07:46	07:37	08:18
	16:52	17:43	18:29	20:18		21:04		21:37	21:33	20:49	23	20:18 (WEA H5)	19:45	18:40	16:46	16:26	
15	08:21	07:40	06:43	06:37		05:43		05:18	05:34	06:16			19:56 (WEA H5)	07:02	07:48	07:39	08:18
	16:53	17:45	18:31	20:20		21:05		21:38	21:32	20:47	22	20:18 (WEA H5)	19:43	18:38	16:45	16:26	
16	08:20	07:38	06:41	06:35		05:42		05:18	05:35	06:17			19:56 (WEA H5)	07:03	07:49	07:40	08:19
	16:55	17:46	18:33	20:21		21:07		21:38	21:31	20:45	21	20:17 (WEA H5)	19:41	18:36	16:43	16:26	
17	08:19	07:36	06:39	06:33		05:40		05:18	05:36	06:19			19:57 (WEA H5)	07:05	07:51	07:42	08:20
	16:56	17:48	18:34	20:23		21:08		21:39	21:30	20:44	19	20:16 (WEA H5)	19:39	18:34	16:42	16:26	
18	08:18	07:34	06:37	06:31		05:39		05:18	05:37	06:20			19:57 (WEA H5)	07:06	07:53	07:43	08:21
	16:58	17:50	18:36	20:25		21:10		21:39	21:29	20:42	17	20:14 (WEA H5)	19:36	18:32	16:41	16:27	
19	08:17	07:32	06:35	06:29		05:38		05:18	05:39	06:22			19:59 (WEA H5)	07:08	07:54	07:45	08:21
	16:59	17:51	18:37	20:26		21:11		21:39	21:28	20:40	14	20:13 (WEA H5)	19:37	18:29	16:40	16:27	
20	08:16	07:30	06:32	06:27		05:36		05:18	05:40	06:23			20:01 (WEA H5)	07:09	07:56	07:47	08:22
	17:01	17:53	18:39	20:28		21:12		21:40	21:27	20:38	9	20:10 (WEA H5)	19:32	18:28	16:39	16:27	
21	08:16	07:28	06:30	06:25		05:35		05:18	05:41	06:25			07:11	07:57	07:48	08:23	
	17:02	17:55	18:41	20:29		21:14		21:40	21:26	20:36			19:30	18:26	16:38	16:28	
22	08:14	07:27	06:28	06:23		05:34		05:18	05:42	06:26			07:12	07:59	07:50	08:23	
	17:04	17:56	18:42	20:31		21:15		21:40	21:25	20:34			19:28	18:24	16:37	16:28	
23	08:13	07:25	06:26	06:21		05:33	19:55 (WEA H5)	05:19	05:44	06:28			07:14	08:01	07:51	08:24	
	17:05	17:58	18:44	20:32	10	20:05 (WEA H5)	20:05 (WEA H5)	21:40	21:23	20:32			19:25	18:22	16:36	16:29	
24	08:12	07:23	06:24	06:19		05:32	19:52 (WEA H5)	05:19	05:45	06:29			07:15	08:02	07:53	08:24	
	17:07	18:00	18:45	20:34	15	20:07 (WEA H5)	20:07 (WEA H5)	21:40	21:22	20:30			19:23	18:21	16:35	16:29	
25	08:11	07:21	06:22	06:17		05:31	19:50 (WEA H5)	05:19	05:46	06:31			07:17	07:04	07:54	08:25	
	17:09	18:02	18:47	20:35		05:38	20:08 (WEA H5)	21:41	21:21	20:28			19:21	17:19	16:34	16:30	
26	08:10	07:19	06:15	06:10		05:32	19:50 (WEA H5)	05:20	05:47	06:32			07:18	07:06	07:56	08:25	
	17:10	18:03	18:48	20:37	20	20:10 (WEA H5)	20:10 (WEA H5)	21:41	21:20	20:26			19:19	17:17	16:33	16:30	
27	08:09	07:17	06:17	06:13		05:29	19:49 (WEA H5)	05:20	05:49	06:34			07:20	07:07	07:57	08:25	
	17:12	18:05	18:50	20:38	21	20:10 (WEA H5)	20:10 (WEA H5)	21:41	21:18	20:24			19:17	17:15	16:32	16:31	
28	08:08	07:15	06:15	06:11		05:28	19:48 (WEA H5)	05:20	05:50	06:35			07:21	07:09	07:59	08:25	
	17:14	18:07	18:52	20:40	22	20:10 (WEA H5)	20:10 (WEA H5)	21:40	21:17	20:22			19:14	17:13	16:31	16:32	
29	08:06		07:13	06:09		05:27	19:47 (WEA H5)	05:21	05:51	06:37			07:23	07:11	08:00	08:26	
	17:15		19:53	20:42	23	20:10 (WEA H5)	20:10 (WEA H5)	21:40	21:16	20:20			19:12	17:11	16:31	16:33	
30	08:05		07:11	06:07		05:26	19:47 (WEA H5)	05:21	05:53	06:38			07:24	07:12	08:01	08:26	
	17:17		19:55	20:43	24	20:11 (WEA H5)	20:11 (WEA H5)	21:40	21:14	20:18			19:10	17:10	16:30	16:34	
31	08:04		07:08			05:25			05:54	06:40				07:14	08:01	08:26	
	17:19		19:56			21:26			21:13	20:15				17:08	16:30	16:35	
Sonnenscheinstunden	267	282	368	412		477			488	492	448		380	334	273	254	
astr.max.mögl.Beschattung				153		222											
Red.Sonnenscheinwahrsch.				0,40		0,45											
Reduktion Betriebsdauer				0,92		0,92											
Reduktion Windrichtung				0,57		0,57											
Gesamte Reduktion				0,21		0,24											
Met.wahrsch.Beschattung				32		53					97						

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 09 - Mainz-Hechtsheim, Mögliches Wohnhaus
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1	08:26 16:36	08:02 17:20	07:13 18:08	07:06 19:58	06:06 20:45	05:24 21:27	05:22 21:40	20:16 (WEA H5) 20:35 (WEA H5)	05:56 21:11	06:41 20:13	07:26 19:08	07:16 17:06
2	08:26 16:37	08:01 17:22	07:11 18:10	07:04 20:00	06:04 20:46	05:24 21:28	05:23 21:40	20:17 (WEA H5) 20:33 (WEA H5)	05:57 21:10	06:43 20:11	07:28 19:06	07:17 17:04
3	08:26 16:38	07:59 17:24	07:09 18:12	07:02 20:01	06:02 20:48	05:23 21:29	05:23 21:39	20:19 (WEA H5) 20:33 (WEA H5)	05:58 21:08	06:44 20:09	07:29 19:04	07:19 17:03
4	08:26 16:39	07:58 17:26	07:07 18:13	07:00 20:03	06:00 20:49	05:22 21:30	05:24 21:39	20:21 (WEA H5) 20:31 (WEA H5)	06:00 21:07	06:46 20:07	07:31 19:01	07:21 17:01
5	08:25 16:40	07:56 17:27	07:04 18:15	06:58 20:04	05:59 20:51	05:22 21:31	05:25 21:39	06:01 21:05	06:47 20:05	07:32 18:59	07:22 16:59	08:08 16:27
6	08:25 16:41	07:55 17:29	07:02 18:17	06:56 20:06	05:57 20:52	05:21 21:32	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57	07:24 16:58	08:09 16:27
7	08:25 16:42	07:53 17:31	07:00 18:18	06:53 20:07	05:55 20:54	05:20 21:32	05:26 21:38	06:04 21:02	06:50 20:01	07:35 18:55	07:26 16:56	08:10 16:27
8	08:25 16:44	07:52 17:33	06:58 18:20	06:51 20:09	05:54 20:55	05:20 21:33	20:17 (WEA H5) 20:25 (WEA H5)	06:06 21:00	06:52 19:58	07:37 18:53	07:27 16:55	08:12 16:26
9	08:24 16:45	07:50 17:34	06:56 18:21	06:49 20:11	05:52 20:57	05:20 21:34	20:14 (WEA H5) 20:27 (WEA H5)	06:07 20:58	06:53 19:56	07:38 18:51	07:29 16:53	08:13 16:26
10	08:24 16:46	07:48 17:36	06:54 18:23	06:47 20:12	05:51 20:58	05:19 21:35	20:13 (WEA H5) 20:29 (WEA H5)	06:09 20:56	06:55 19:54	07:40 18:49	07:30 16:52	08:14 16:26
11	08:23 16:48	07:47 17:38	06:52 18:25	06:45 20:14	05:49 21:00	05:19 21:35	20:12 (WEA H5) 20:30 (WEA H5)	06:10 20:55	06:56 19:52	07:41 18:47	07:32 16:50	08:15 16:26
12	08:23 16:49	07:45 17:39	06:50 18:26	06:43 20:15	05:48 21:01	05:19 21:36	20:11 (WEA H5) 20:31 (WEA H5)	06:11 20:53	06:57 19:50	07:43 18:45	07:34 16:49	08:16 16:26
13	08:22 16:50	07:43 17:41	06:48 18:28	06:41 20:17	05:46 21:03	05:18 21:37	20:10 (WEA H5) 20:32 (WEA H5)	06:13 20:51	06:59 19:47	07:45 18:42	07:35 16:47	08:17 16:26
14	08:21 16:52	07:41 17:43	06:45 18:30	06:39 20:18	05:45 21:04	05:18 21:37	20:10 (WEA H5) 20:33 (WEA H5)	06:14 20:49	07:00 19:45	07:46 18:40	07:37 16:46	08:18 16:26
15	08:21 16:53	07:40 17:45	06:43 18:31	06:37 20:20	05:43 21:05	05:18 21:38	20:14 (WEA H5) 20:34 (WEA H5)	06:16 20:47	07:02 19:43	07:48 18:38	07:39 16:45	08:19 16:26
16	08:20 16:55	07:38 17:46	06:41 18:33	06:35 20:21	05:42 21:07	05:18 21:38	20:09 (WEA H5) 20:34 (WEA H5)	06:17 20:46	07:03 19:41	07:49 18:36	07:40 16:44	08:19 16:26
17	08:19 16:56	07:36 17:48	06:39 18:34	06:33 20:23	05:40 21:08	05:18 21:39	20:09 (WEA H5) 20:35 (WEA H5)	06:19 20:44	07:05 19:39	07:51 18:34	07:42 16:42	08:20 16:26
18	08:18 16:58	07:34 17:50	06:37 18:36	06:31 20:25	05:39 21:10	05:18 21:39	20:09 (WEA H5) 20:35 (WEA H5)	06:20 20:42	07:06 19:37	07:53 18:32	07:43 16:41	08:21 16:27
19	08:17 16:59	07:32 17:51	06:35 18:37	06:29 20:26	05:38 21:11	05:18 21:39	20:09 (WEA H5) 20:36 (WEA H5)	06:22 20:40	07:08 19:34	07:54 18:30	07:45 16:40	08:22 16:27
20	08:17 17:01	07:30 17:53	06:32 18:39	06:27 20:28	05:36 21:12	05:18 21:40	20:09 (WEA H5) 20:36 (WEA H5)	06:23 20:38	07:09 19:32	07:56 18:28	07:47 16:39	08:22 16:27
21	08:16 17:02	07:29 17:55	06:30 18:41	06:25 20:29	05:35 21:14	05:18 21:40	20:10 (WEA H5) 20:37 (WEA H5)	06:25 20:36	07:11 19:30	07:57 18:26	07:48 16:38	08:23 16:28
22	08:15 17:04	07:27 17:57	06:28 18:42	06:23 20:31	05:34 21:15	05:18 21:40	20:10 (WEA H5) 20:37 (WEA H5)	06:26 20:34	07:12 19:28	07:59 18:24	07:50 16:37	08:23 16:28
23	08:13 17:06	07:25 17:58	06:26 18:44	06:21 20:32	05:33 21:16	05:19 21:40	20:10 (WEA H5) 20:37 (WEA H5)	06:28 20:32	07:14 19:25	08:01 18:22	07:51 16:36	08:24 16:29
24	08:12 17:07	07:23 18:00	06:24 18:45	06:19 20:34	05:32 21:18	05:19 21:40	20:10 (WEA H5) 20:36 (WEA H5)	06:29 20:30	07:15 19:23	08:02 18:21	07:53 16:35	08:24 16:29
25	08:11 17:09	07:21 18:02	06:22 18:47	06:17 20:35	05:31 21:19	05:19 21:41	20:11 (WEA H5) 20:37 (WEA H5)	06:31 20:28	07:17 19:21	07:04 18:19	07:54 16:34	08:25 16:30
26	08:10 17:10	07:19 18:03	06:19 18:49	06:15 20:37	05:30 21:20	05:20 21:41	20:11 (WEA H5) 20:37 (WEA H5)	06:32 20:26	07:18 19:19	07:06 18:17	07:56 16:33	08:25 16:31
27	08:09 17:12	07:17 18:05	06:17 18:50	06:13 20:39	05:29 21:21	05:20 21:41	20:13 (WEA H5) 20:37 (WEA H5)	06:34 20:24	07:20 19:17	07:07 18:15	07:57 16:32	08:25 16:31
28	08:08 17:14	07:15 18:07	06:15 18:52	06:11 20:40	05:28 21:22	05:20 21:40	20:13 (WEA H5) 20:36 (WEA H5)	06:35 20:22	07:21 19:15	07:09 18:13	07:59 16:31	08:25 16:32
29	08:06 17:15		07:13 19:53	06:09 20:42	05:27 21:23	05:21 21:40	20:14 (WEA H5) 20:36 (WEA H5)	06:37 20:20	07:23 19:12	07:11 18:11	08:00 16:31	08:26 16:33
30	08:05 17:17		07:11 19:55	06:08 20:43	05:26 21:25	05:22 21:40	20:15 (WEA H5) 20:35 (WEA H5)	06:38 20:18	07:24 19:10	07:12 18:10	08:01 16:30	08:26 16:34
31	08:04 17:19		07:09 19:56		05:25 21:26		05:54 21:13	06:40 20:15		07:14 17:08		08:26 16:35
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	254
astr.max.mögl.Beschattung						523	59					
Red.Sonnenscheinwahrsch.						0,98	0,46					
Reduktion Betriebsdauer						0,92	0,24					
Reduktion Windrichtung						0,56	0,56					
Gesamte Reduktion						0,20	0,24					
Met.wahrsch.Beschattung						103	14					

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 12 - Mainz-Hechtsheim, Adam-Opel-Str. 6
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan	Feb	Mär	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez
1,48	2,93	3,80	5,50	6,94	6,23	7,34	6,96	5,12	2,77	1,83	1,21

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
335	502	703	682	487	528	701	1.072	1.337	901	465	321	8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni	Juli	August	September	Oktober	November	Dezember
1 08:26	14:43 (WEA H5)	08:02	07:13	07:06	06:06	05:24	05:22	05:56	06:41	07:26	07:16	08:03
16:36	15:21 (WEA H5)	17:20	18:08	19:58	20:45	21:27	21:40	21:11	20:13	19:08	17:06	16:29
2 08:26	14:44 (WEA H5)	08:01	07:11	07:04	06:04	05:23	05:23	05:57	06:43	07:28	07:17	08:04
16:37	15:22 (WEA H5)	17:22	18:10	20:00	20:46	21:28	21:40	21:10	20:11	19:06	17:04	16:29
3 08:26	14:45 (WEA H5)	07:59	07:09	07:02	06:02	05:23	05:23	05:58	06:44	07:29	07:19	08:06
16:38	15:22 (WEA H5)	17:24	18:12	20:01	20:48	21:29	21:39	21:08	20:09	19:04	17:03	16:28
4 08:26	14:44 (WEA H5)	07:58	07:07	07:00	06:00	05:22	05:24	06:00	06:46	07:31	07:21	08:07
16:39	15:22 (WEA H5)	17:26	18:13	20:03	20:49	21:30	21:39	21:07	20:07	19:01	17:01	16:28
5 08:26	14:45 (WEA H5)	07:56	07:04	06:58	05:59	05:22	05:25	06:01	06:47	07:32	07:22	08:08
16:40	15:23 (WEA H5)	17:27	18:15	20:04	20:51	21:31	21:39	21:05	20:05	18:59	16:59	16:27
6 08:25	14:46 (WEA H5)	07:55	07:02	06:56	05:57	05:21	05:26	06:03	06:49	07:34	07:24	08:09
16:41	15:23 (WEA H5)	17:29	18:17	20:06	20:52	21:32	21:38	21:03	20:03	18:57	16:58	16:27
7 08:25	14:46 (WEA H5)	07:53	07:00	06:53	05:55	05:20	05:26	06:04	06:50	07:35	07:26	08:10
16:42	15:23 (WEA H5)	17:31	18:18	20:07	20:54	21:32	21:38	21:02	20:01	18:55	16:56	16:27
8 08:25	14:47 (WEA H5)	07:52	06:58	06:51	05:54	05:20	05:27	06:06	06:52	07:37	07:27	08:12
16:44	15:24 (WEA H5)	17:32	18:20	20:09	20:55	21:33	21:37	21:00	19:58	18:53	16:55	16:26
9 08:24	14:47 (WEA H5)	07:50	06:56	06:49	05:52	05:20	05:28	06:07	06:53	07:38	07:29	08:13
16:45	15:24 (WEA H5)	17:34	18:21	20:11	20:57	21:34	21:37	20:58	19:56	18:51	16:53	16:26
10 08:24	14:49 (WEA H5)	07:48	06:54	06:47	05:51	05:19	05:29	06:08	06:54	07:40	07:31	08:14
16:46	15:24 (WEA H5)	17:36	18:23	20:12	20:58	21:35	21:36	20:56	19:54	18:49	16:52	16:26
11 08:23	14:49 (WEA H5)	07:47	06:52	06:45	05:49	05:19	05:30	06:10	06:56	07:42	07:32	08:15
16:48	15:24 (WEA H5)	17:38	18:25	20:14	21:00	21:35	21:35	20:55	19:52	18:47	16:50	16:26
12 08:23	14:49 (WEA H5)	07:45	06:50	06:43	05:47	05:19	05:31	06:11	06:57	07:43	07:34	08:16
16:49	15:24 (WEA H5)	17:39	18:26	20:15	21:01	21:36	21:34	20:53	19:50	18:45	16:49	16:26
13 08:22	14:50 (WEA H5)	07:43	06:48	06:41	05:46	05:18	05:32	06:13	06:59	07:45	07:35	08:17
16:50	15:24 (WEA H5)	17:41	18:28	20:17	21:03	21:37	21:34	20:51	19:47	18:42	16:47	16:26
14 08:21	14:52 (WEA H5)	07:41	06:45	06:39	05:45	05:18	05:33	06:14	07:00	07:46	07:37	08:18
16:52	15:25 (WEA H5)	17:43	18:30	20:18	21:04	21:37	21:33	20:49	19:45	18:40	16:46	16:26
15 08:21	14:52 (WEA H5)	07:40	06:43	06:37	05:43	05:18	05:34	06:16	07:02	07:48	07:39	08:19
16:53	15:24 (WEA H5)	17:45	18:31	20:20	21:06	21:38	21:32	20:47	19:43	18:38	16:45	16:26
16 08:20	14:53 (WEA H5)	07:38	06:41	06:35	05:42	05:18	05:35	06:17	07:03	07:49	07:40	08:19
16:55	15:24 (WEA H5)	17:46	18:33	20:21	21:07	21:38	21:31	20:46	19:41	18:36	16:43	16:26
17 08:19	14:54 (WEA H5)	07:36	06:39	06:33	05:40	05:18	05:36	06:19	07:05	07:51	07:42	08:20
16:56	15:24 (WEA H5)	17:48	18:34	20:23	21:08	21:39	21:30	20:44	19:39	18:34	16:42	16:26
18 08:18	14:55 (WEA H5)	07:34	06:37	06:31	05:39	05:18	05:37	06:20	07:06	07:53	07:44	08:21
16:58	15:23 (WEA H5)	17:50	18:36	20:25	21:10	21:39	21:29	20:42	19:37	18:32	16:41	16:27
19 08:17	14:57 (WEA H5)	07:32	06:35	06:29	05:38	05:18	05:39	06:22	07:08	07:54	07:45	08:22
16:59	15:23 (WEA H5)	17:51	18:37	20:26	21:11	21:39	21:28	20:40	19:34	18:30	16:40	16:27
20 08:17	14:58 (WEA H5)	07:30	06:32	06:27	05:36	05:18	05:40	06:23	07:09	07:56	07:47	08:22
17:01	15:22 (WEA H5)	17:53	18:39	20:28	21:12	21:40	21:27	20:38	19:32	18:28	16:39	16:27
18 08:16	15:00 (WEA H5)	07:29	06:30	06:25	05:35	05:18	05:41	06:25	07:11	07:57	07:48	08:23
17:02	15:21 (WEA H5)	17:55	18:41	20:29	21:14	21:40	21:26	20:36	19:30	18:26	16:38	16:28
22 08:15	15:02 (WEA H5)	07:27	06:28	06:23	05:34	05:18	05:42	06:26	07:12	07:59	07:50	08:23
17:04	15:20 (WEA H5)	17:57	18:42	20:31	21:15	21:40	21:25	20:34	19:28	18:24	16:37	16:28
23 08:14	15:04 (WEA H5)	07:25	06:26	06:21	05:33	05:19	05:44	06:28	07:14	08:01	07:51	08:24
17:05	15:18 (WEA H5)	17:58	18:44	20:32	21:16	21:40	21:24	20:32	19:25	18:22	16:36	16:29
24 08:12	15:08 (WEA H5)	07:23	06:24	06:19	05:32	05:19	05:45	06:29	07:15	08:02	07:53	08:24
17:07	15:15 (WEA H5)	18:00	18:45	20:34	21:18	21:41	21:22	20:30	19:23	18:21	16:35	16:29
25 08:11	07:21	06:22	06:17	05:31	05:19	05:46	06:31	07:17	07:04	07:54	14:32 (WEA H5)	08:25
17:09	18:02	18:47	20:35	21:19	21:41	21:21	21:21	20:28	19:21	17:19	16:34	16:30
26 08:10	07:19	06:19	06:15	05:30	05:20	05:47	06:32	07:18	07:06	07:56	14:31 (WEA H5)	08:25
17:10	18:03	18:49	20:37	21:20	21:41	21:20	20:26	19:19	17:17	16:33	15:02 (WEA H5)	16:30
27 08:09	07:17	06:17	06:13	05:29	05:20	05:49	06:34	07:20	07:07	07:57	14:31 (WEA H5)	08:25
17:12	18:05	18:50	20:39	21:21	21:41	21:18	20:24	19:17	17:15	16:32	15:03 (WEA H5)	16:31
28 08:08	07:15	06:15	06:11	05:28	05:20	05:50	06:35	07:21	07:09	07:59	14:31 (WEA H5)	08:26
17:14	18:07	18:52	20:40	21:22	21:41	21:17	20:22	19:15	17:13	16:31	15:04 (WEA H5)	16:32
29 08:06	07:13	06:09	05:27	05:21	05:51	06:37	07:23	07:11	08:00	08:00	14:31 (WEA H5)	08:26
17:15	19:53	20:42	21:24	21:40	21:16	20:20	19:12	17:11	16:31	15:05 (WEA H5)	16:33	16:30
30 08:05	07:11	06:08	05:26	05:21	05:53	06:38	07:24	07:12	08:02	08:02	14:31 (WEA H5)	08:26
17:17	19:55	20:43	21:25	21:40	21:14	20:18	19:10	17:10	16:30	15:05 (WEA H5)	16:34	16:38
31 08:04	07:09	05:25	05:25	05:25	05:54	06:40	07:14	07:14	07:14	07:14	16:35	16:39
17:19	19:56	21:26	21:26	21:26	21:13	20:16	17:08	17:08	17:08	17:08	16:35	15:21 (WEA H5)
Sonnenscheinstunden	267	282	368	412	477	488	492	448	380	334	273	253
astr.max.mögl.Beschattung	740										332	1171
Red.Sonnenscheinwahrsch.	0,17										0,20	0,15
Reduktion Betriebsdauer	0,92										0,92	0,92
Reduktion Windrichtung	0,73										0,73	0,73
Gesamte Reduktion	0,11										0,13	0,10
Met.wahrsch.Beschattung	85										44	116

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

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

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 13 - Mainz-Hechtsheim, Adam-Opel-Str. 10

Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe

335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:26 16:36	08:02 17:20	15:26 (WEA H5) 17:31	07:13 18:08	07:06 19:58	05:24 21:27
2	08:26 16:37	08:01 17:22	15:25 (WEA H5) 17:33	07:11 18:10	07:04 20:00	05:23 21:28
3	08:26 16:38	07:59 17:24	15:26 (WEA H5) 17:33	07:09 18:12	07:02 20:01	05:23 21:29
4	08:26 16:39	07:58 17:26	15:26 (WEA H5) 17:33	07:07 18:13	07:00 20:03	05:22 21:30
5	08:26 16:40	07:56 17:27	15:27 (WEA H5) 17:33	07:04 18:15	06:58 20:04	05:22 21:31
6	08:25 16:41	07:55 17:29	15:27 (WEA H5) 17:33	07:02 18:17	06:56 20:06	05:21 21:32
7	08:25 16:42	07:53 17:31	15:28 (WEA H5) 17:33	07:00 18:18	06:53 20:07	05:20 21:32
8	08:25 16:44	15:36 (WEA H5) 17:33	15:29 (WEA H5) 17:33	06:58 18:20	06:51 20:09	05:20 21:33
9	08:24 16:45	15:34 (WEA H5) 17:34	15:30 (WEA H5) 17:34	06:56 18:21	06:49 20:11	05:20 21:34
10	08:24 16:46	15:33 (WEA H5) 17:36	15:30 (WEA H5) 17:36	06:54 18:23	06:47 20:12	05:19 21:35
11	08:23 16:48	15:32 (WEA H5) 17:38	15:31 (WEA H5) 17:38	06:52 18:25	06:45 20:14	05:19 21:35
12	08:23 16:49	15:30 (WEA H5) 17:39	15:33 (WEA H5) 17:39	06:50 18:26	06:43 20:15	05:19 21:36
13	08:22 16:50	15:29 (WEA H5) 17:41	15:35 (WEA H5) 17:41	06:48 18:28	06:41 20:17	05:18 21:37
14	08:21 16:52	15:30 (WEA H5) 17:43	15:37 (WEA H5) 17:43	06:45 18:30	06:39 20:18	05:18 21:37
15	08:21 16:53	15:29 (WEA H5) 17:45	15:39 (WEA H5) 17:45	06:43 18:31	06:37 20:20	05:18 21:38
16	08:20 16:55	15:28 (WEA H5) 17:46	15:42 (WEA H5) 17:46	06:41 18:33	06:35 20:21	05:18 21:38
17	08:19 16:56	15:28 (WEA H5) 17:48	15:56 (WEA H5) 17:48	06:39 18:34	06:33 20:23	05:18 21:39
18	08:18 16:58	15:27 (WEA H5) 17:50	15:59 (WEA H5) 17:50	06:37 18:36	06:31 20:25	05:18 21:39
19	08:17 16:59	15:27 (WEA H5) 17:51	15:57 (WEA H5) 17:51	06:35 18:37	06:29 20:26	05:18 21:39
20	08:17 17:01	15:27 (WEA H5) 17:53	15:57 (WEA H5) 17:53	06:32 18:39	06:27 20:28	05:18 21:40
21	08:16 17:02	15:26 (WEA H5) 17:55	15:56 (WEA H5) 17:55	06:30 18:41	06:25 20:29	05:18 21:40
22	08:15 17:04	15:26 (WEA H5) 17:57	15:56 (WEA H5) 17:57	06:28 18:42	06:23 20:31	05:18 21:40
23	08:14 17:05	15:25 (WEA H5) 17:58	15:55 (WEA H5) 17:58	06:26 18:44	06:21 20:32	05:19 21:40
24	08:12 17:07	15:25 (WEA H5) 18:00	15:55 (WEA H5) 18:00	06:24 18:45	06:19 20:34	05:19 21:41
25	08:11 17:09	15:25 (WEA H5) 18:02	15:55 (WEA H5) 18:02	06:22 18:47	06:17 20:35	05:19 21:41
26	08:10 17:10	15:26 (WEA H5) 18:03	15:56 (WEA H5) 18:03	06:19 18:49	06:15 20:37	05:20 21:41
27	08:09 17:12	15:25 (WEA H5) 18:05	15:55 (WEA H5) 18:05	06:17 18:50	06:13 20:39	05:20 21:41
28	08:08 17:14	15:25 (WEA H5) 18:07	15:55 (WEA H5) 18:07	06:15 18:52	06:11 20:40	05:20 21:41
29	08:06 17:15	15:25 (WEA H5) 18:07	15:55 (WEA H5) 18:07	07:13 19:53	06:09 20:42	05:21 21:40
30	08:05 17:17	15:25 (WEA H5) 18:07	15:55 (WEA H5) 18:07	07:11 19:55	06:08 20:43	05:21 21:40
31	08:04 17:19	15:25 (WEA H5) 18:07	15:55 (WEA H5) 18:07	07:09 19:56	05:25 21:26	05:21 21:40
Sonnenscheinstunden	267	282	368	412	477	488
astr.max.mögl.Beschattung	774	565				
Red.Sonnenscheinwahrsch.	0,17	0,29				
Reduktion Betriebsdauer	0,92	0,92				
Reduktion Windrichtung	0,72	0,72				
Gesamte Reduktion	0,11	0,19				
Met.wahrsch.Beschattung	88	109				

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

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

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 13 - Mainz-Hechtsheim, Adam-Opel-Str. 10

Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe

335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober		November		Dezember	
1	05:22 21:40	05:56 21:11	06:41 20:13	07:26 19:08		07:16 17:06	36 15:00 (WEA H5)	08:03 16:29	15:14 (WEA H5) 19 15:33 (WEA H5)
2	05:23 21:40	05:57 21:10	06:43 20:11	07:28 19:06		07:17 17:04	38 14:59 (WEA H5)	08:04 16:29	15:15 (WEA H5) 17 15:32 (WEA H5)
3	05:23 21:39	05:58 21:08	06:44 20:09	07:29 19:04		07:19 17:03	39 14:58 (WEA H5)	08:06 16:28	15:18 (WEA H5) 13 15:31 (WEA H5)
4	05:24 21:39	06:00 21:07	06:46 20:07	07:31 19:01		07:21 17:01	41 14:57 (WEA H5)	08:07 16:28	15:20 (WEA H5) 9 15:29 (WEA H5)
5	05:25 21:39	06:01 21:05	06:47 20:05	07:32 18:59		07:22 16:59	42 14:57 (WEA H5)	08:08 16:27	
6	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57		07:24 16:58	42 14:57 (WEA H5)	08:09 16:27	
7	05:26 21:38	06:04 21:02	06:50 20:01	07:35 18:55		07:26 16:56	43 14:57 (WEA H5)	08:10 16:27	
8	05:27 21:37	06:06 21:00	06:52 19:58	07:37 18:53		07:27 16:55	43 14:56 (WEA H5)	08:12 16:26	
9	05:28 21:37	06:07 20:58	06:53 19:56	07:38 18:51		07:29 16:53	44 14:56 (WEA H5)	08:13 16:26	
10	05:29 21:36	06:08 20:56	06:54 19:54	07:40 18:49		07:30 16:52	44 14:56 (WEA H5)	08:14 16:26	
11	05:30 21:35	06:10 20:55	06:56 19:52	07:41 18:47		07:32 16:50	43 14:57 (WEA H5)	08:15 16:26	
12	05:31 21:34	06:11 20:53	06:57 19:50	07:43 18:45		07:34 16:49	44 14:57 (WEA H5)	08:16 16:26	
13	05:32 21:34	06:13 20:51	06:59 19:47	07:45 18:42		07:35 16:47	43 14:57 (WEA H5)	08:17 16:26	
14	05:33 21:33	06:14 20:49	07:00 19:45	07:46 18:40		07:37 16:46	43 14:57 (WEA H5)	08:18 16:26	
15	05:34 21:32	06:16 20:47	07:02 19:43	07:48 18:38		07:39 16:45	42 14:58 (WEA H5)	08:19 16:26	
16	05:35 21:31	06:17 20:46	07:03 19:41	07:49 18:36		07:40 16:43	41 14:59 (WEA H5)	08:19 16:26	
17	05:36 21:30	06:19 20:44	07:05 19:39	07:51 18:34		07:42 16:42	41 14:58 (WEA H5)	08:20 16:26	
18	05:37 21:29	06:20 20:42	07:06 19:37	07:53 18:32		07:44 16:41	40 14:59 (WEA H5)	08:21 16:27	
19	05:39 21:28	06:22 20:40	07:08 19:34	07:54 18:30		07:45 16:40	40 15:00 (WEA H5)	08:22 16:27	
20	05:40 21:27	06:23 20:38	07:09 19:32	07:56 18:28		07:47 16:39	39 15:01 (WEA H5)	08:22 16:27	
21	05:41 21:26	06:25 20:36	07:11 19:30	07:57 18:26		07:48 16:38	38 15:01 (WEA H5)	08:23 16:28	
22	05:42 21:25	06:26 20:34	07:12 19:28	07:59 18:24		07:50 16:37	36 15:03 (WEA H5)	08:23 16:28	
23	05:44 21:24	06:28 20:32	07:14 19:25	08:01 18:22		07:51 16:36	34 15:04 (WEA H5)	08:24 16:29	
24	05:45 21:22	06:29 20:30	07:15 19:23	08:02 18:21		07:53 16:35	33 15:04 (WEA H5)	08:24 16:29	
25	05:46 21:21	06:31 20:28	07:17 19:21	08:04 17:19	15:16 (WEA H5) 5 15:21 (WEA H5)	07:54 16:34	31 15:06 (WEA H5)	08:25 16:30	
26	05:47 21:20	06:32 20:26	07:18 19:19	08:06 17:17	15:11 (WEA H5) 16 15:27 (WEA H5)	07:56 16:33	30 15:06 (WEA H5)	08:25 16:30	
27	05:49 21:18	06:34 20:24	07:20 19:17	08:07 17:15	15:08 (WEA H5) 22 15:30 (WEA H5)	07:57 16:32	28 15:08 (WEA H5)	08:25 16:31	
28	05:50 21:17	06:35 20:22	07:21 19:15	08:09 17:13	15:06 (WEA H5) 26 15:32 (WEA H5)	07:59 16:31	26 15:09 (WEA H5)	08:26 16:32	
29	05:51 21:16	06:37 20:20	07:23 19:12	08:11 17:11	15:04 (WEA H5) 30 15:34 (WEA H5)	08:00 16:31	25 15:10 (WEA H5)	08:26 16:33	
30	05:53 21:14	06:38 20:18	07:24 19:10	08:12 17:10	15:02 (WEA H5) 32 15:34 (WEA H5)	08:02 16:30	22 15:11 (WEA H5)	08:26 16:34	
31	05:54 21:13	06:40 20:16		08:14 17:08	15:01 (WEA H5) 34 15:35 (WEA H5)			08:26 16:35	
Sonneneinstrahlung	492	448	380	334		273		253	
astr.max.mögl.Beschattung				165		1131			58
Red.Sonneneinstrahlung				0,26		0,20			0,15
Reduktion Betriebsdauer				0,92		0,92			0,92
Reduktion Windrichtung				0,72		0,72			0,72
Gesamte Reduktion				0,17		0,13			0,10
Met.wahrsch.Beschattung				28		150			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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 14 - Mainz-Hechtsheim, Adam-Opel-Str. 8
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe

335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai	Juni
1	08:26 16:36 37	14:57 (WEA H5) 08:02 15:34 (WEA H5) 17:20 19	15:17 (WEA H5) 07:13 15:36 (WEA H5) 18:08	07:06 19:58	06:06 20:45	05:24 21:27
2	08:26 16:37 38	14:57 (WEA H5) 08:01 15:35 (WEA H5) 17:22 12	15:20 (WEA H5) 07:11 15:32 (WEA H5) 18:10	07:04 20:00	06:04 20:46	05:23 21:28
3	08:26 16:38 38	14:58 (WEA H5) 07:59 15:36 (WEA H5) 17:24	07:09 18:12	07:02 20:01	06:02 20:48	05:23 21:29
4	08:26 16:39 39	14:57 (WEA H5) 07:58 15:36 (WEA H5) 17:26	07:07 18:13	07:00 20:03	06:00 20:49	05:22 21:30
5	08:26 16:40 39	14:58 (WEA H5) 07:56 15:37 (WEA H5) 17:27	07:04 18:15	06:58 20:04	05:59 20:51	05:22 21:31
6	08:25 16:41 39	14:59 (WEA H5) 07:55 15:38 (WEA H5) 17:29	07:02 18:17	06:56 20:06	05:57 20:52	05:21 21:32
7	08:25 16:42 39	14:59 (WEA H5) 07:53 15:38 (WEA H5) 17:31	07:00 18:18	06:53 20:07	05:55 20:54	05:20 21:32
8	08:25 16:44 40	14:59 (WEA H5) 07:52 15:39 (WEA H5) 17:32	06:58 18:20	06:51 20:09	05:54 20:55	05:20 21:33
9	08:24 16:45 40	14:59 (WEA H5) 07:50 15:39 (WEA H5) 17:34	06:56 18:21	06:49 20:11	05:52 20:57	05:20 21:34
10	08:24 16:46 40	15:00 (WEA H5) 07:48 15:40 (WEA H5) 17:36	06:54 18:23	06:47 20:12	05:51 20:58	05:19 21:35
11	08:23 16:48 40	15:00 (WEA H5) 07:47 15:40 (WEA H5) 17:38	06:52 18:25	06:45 20:14	05:49 21:00	05:19 21:35
12	08:23 16:49 40	15:00 (WEA H5) 07:45 15:40 (WEA H5) 17:39	06:50 18:26	06:43 20:15	05:47 21:01	05:19 21:36
13	08:22 16:50 40	15:00 (WEA H5) 07:43 15:40 (WEA H5) 17:41	06:48 18:28	06:41 20:17	05:46 21:03	05:18 21:37
14	08:21 16:52 41	15:01 (WEA H5) 07:41 15:42 (WEA H5) 17:43	06:45 18:30	06:39 20:18	05:45 21:04	05:18 21:37
15	08:21 16:53 40	15:02 (WEA H5) 07:40 15:42 (WEA H5) 17:45	06:43 18:31	06:37 20:20	05:43 21:06	05:18 21:38
16	08:20 16:55 40	15:02 (WEA H5) 07:38 15:42 (WEA H5) 17:46	06:41 18:33	06:35 20:21	05:42 21:07	05:18 21:38
17	08:19 16:56 40	15:02 (WEA H5) 07:36 15:42 (WEA H5) 17:48	06:39 18:34	06:33 20:23	05:40 21:08	05:18 21:39
18	08:18 16:58 39	15:03 (WEA H5) 07:34 15:42 (WEA H5) 17:50	06:37 18:36	06:31 20:25	05:39 21:10	05:18 21:39
19	08:17 16:59 40	15:03 (WEA H5) 07:32 15:43 (WEA H5) 17:51	06:35 18:37	06:29 20:26	05:38 21:11	05:18 21:39
20	08:17 17:01 39	15:04 (WEA H5) 07:30 15:43 (WEA H5) 17:53	06:32 18:39	06:27 20:28	05:36 21:12	05:18 21:40
21	08:16 17:02 38	15:05 (WEA H5) 07:29 15:43 (WEA H5) 17:55	06:30 18:41	06:25 20:29	05:35 21:14	05:18 21:40
22	08:15 17:04 38	15:05 (WEA H5) 07:27 15:43 (WEA H5) 17:57	06:28 18:42	06:23 20:31	05:34 21:15	05:18 21:40
23	08:14 17:05 37	15:05 (WEA H5) 07:25 15:42 (WEA H5) 17:58	06:26 18:44	06:21 20:32	05:33 21:16	05:19 21:40
24	08:12 17:07 36	15:06 (WEA H5) 07:23 15:42 (WEA H5) 18:00	06:24 18:45	06:19 20:34	05:32 21:18	05:19 21:41
25	08:11 17:09 35	15:07 (WEA H5) 07:21 15:42 (WEA H5) 18:02	06:22 18:47	06:17 20:35	05:31 21:19	05:19 21:41
26	08:10 17:10 33	15:09 (WEA H5) 07:19 15:42 (WEA H5) 18:03	06:19 18:49	06:15 20:37	05:30 21:20	05:20 21:41
27	08:09 17:12 32	15:09 (WEA H5) 07:17 15:41 (WEA H5) 18:05	06:17 18:50	06:13 20:39	05:29 21:21	05:20 21:41
28	08:08 17:14 30	15:11 (WEA H5) 07:15 15:41 (WEA H5) 18:07	06:15 18:52	06:11 20:40	05:28 21:22	05:20 21:41
29	08:06 17:15 28	15:11 (WEA H5) 15:39 (WEA H5)	07:13 19:53	06:09 20:42	05:27 21:24	05:21 21:40
30	08:05 17:17 26	15:13 (WEA H5) 15:39 (WEA H5)	07:11 19:55	06:08 20:43	05:26 21:25	05:21 21:40
31	08:04 17:19 22	15:15 (WEA H5) 15:37 (WEA H5)	07:09 19:56	 21:26	05:25 21:26	 488
Sonnenscheinstunden	267	282	368	412	477	
astr.max.mögl.Beschattung	1143	31				
Red.Sonnenscheinwahrsch.	0,17	0,29				
Reduktion Betriebsdauer	0,92	0,92				
Reduktion Windrichtung	0,73	0,73				
Gesamte Reduktion	0,11	0,19				
Met.wahrsch.Beschattung	131	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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
	Minuten mit Schatten	

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 14 - Mainz-Hechtsheim, Adam-Opel-Str. 8
Voraussetzungen für Berechnung des Schattenwurfs

Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	05:22 21:40	05:56 21:11	06:41 20:13	07:26 19:08	07:16 17:06	08:03 16:29
2	05:23 21:40	05:57 21:10	06:43 20:11	07:28 19:06	07:17 17:04	08:04 16:29
3	05:23 21:39	05:58 21:08	06:44 20:09	07:29 19:04	07:19 17:03	08:06 16:28
4	05:24 21:39	06:00 21:07	06:46 20:07	07:31 19:01	07:21 17:01	08:07 16:28
5	05:25 21:39	06:01 21:05	06:47 20:05	07:32 18:59	07:22 16:59	08:08 16:27
6	05:26 21:38	06:03 21:03	06:49 20:03	07:34 18:57	07:24 16:58	08:09 16:27
7	05:26 21:38	06:04 21:02	06:50 20:01	07:35 18:55	07:26 16:56	08:10 16:27
8	05:27 21:37	06:06 21:00	06:52 19:58	07:37 18:53	07:27 16:55	08:12 16:26
9	05:28 21:37	06:07 20:58	06:53 19:56	07:38 18:51	07:29 16:53	08:13 16:26
10	05:29 21:36	06:08 20:56	06:54 19:54	07:40 18:49	07:31 16:52	08:14 16:26
11	05:30 21:35	06:10 20:55	06:56 19:52	07:42 18:47	07:32 16:50	08:15 16:26
12	05:31 21:34	06:11 20:53	06:57 19:50	07:43 18:45	07:34 16:49	08:16 16:26
13	05:32 21:34	06:13 20:51	06:59 19:47	07:45 18:42	07:35 16:47	08:17 16:26
14	05:33 21:33	06:14 20:49	07:00 19:45	07:46 18:40	07:37 16:46	08:18 16:26
15	05:34 21:32	06:16 20:47	07:02 19:43	07:48 18:38	07:39 16:45	08:19 16:26
16	05:35 21:31	06:17 20:46	07:03 19:41	07:49 18:36	07:40 16:43	08:19 16:26
17	05:36 21:30	06:19 20:44	07:05 19:39	07:51 18:34	07:42 16:42	08:20 16:26
18	05:37 21:29	06:20 20:42	07:06 19:37	07:53 18:32	07:44 16:41	08:21 16:27
19	05:39 21:28	06:22 20:40	07:08 19:34	07:54 18:30	07:45 16:40	08:22 16:27
20	05:40 21:27	06:23 20:38	07:09 19:32	07:56 18:28	07:47 16:39	08:22 16:27
21	05:41 21:26	06:25 20:36	07:11 19:30	07:57 18:26	07:48 16:38	08:23 16:28
22	05:42 21:25	06:26 20:34	07:12 19:28	07:59 18:24	07:50 16:37	08:23 16:28
23	05:44 21:24	06:28 20:32	07:14 19:25	08:01 18:22	07:51 16:36	08:24 16:29
24	05:45 21:22	06:29 20:30	07:15 19:23	08:02 18:21	07:53 16:35	08:24 16:29
25	05:46 21:21	06:31 20:28	07:17 19:21	08:04 17:19	07:54 16:34	08:25 16:30
26	05:47 21:20	06:32 20:26	07:18 19:19	08:06 17:17	07:56 16:33	08:25 16:30
27	05:49 21:18	06:34 20:24	07:20 19:17	08:07 17:15	07:57 16:32	08:25 16:31
28	05:50 21:17	06:35 20:22	07:21 19:15	08:09 17:13	07:59 16:31	08:26 16:32
29	05:51 21:16	06:37 20:20	07:23 19:12	08:11 17:11	08:00 16:31	08:26 16:33
30	05:53 21:14	06:38 20:18	07:24 19:10	08:12 17:10	08:02 16:30	08:26 16:34
31	05:54 21:13	06:40 20:16		08:14 17:08		08:26 16:35
Sonnenscheinstunden	492	448	380	334	273	253
astr.max.mögl.Beschattung					748	1147
Red.Sonnenscheinwahrsch.					0,20	0,15
Reduktion Betriebsdauer					0,92	0,92
Reduktion Windrichtung					0,73	0,73
Gesamte Reduktion					0,13	0,10
Met.wahrsch.Beschattung					100	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: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 15 - Klein-Winternheim, Hechtsheimer Berg 53
 Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
 1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
 335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
 Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April		Mai		Juni
1	08:26	08:02	07:13	07:06		06:06	06:29 (WEA H5)	05:24
	16:36	17:21	18:08	19:58		20:45	7 06:36 (WEA H5)	21:27
2	08:26	08:01	07:11	07:04		06:04	06:27 (WEA H5)	05:24
	16:37	17:22	18:10	20:00		20:46	10 06:37 (WEA H5)	21:28
3	08:26	07:59	07:09	07:02		06:02	06:26 (WEA H5)	05:23
	16:38	17:24	18:12	20:01		20:48	12 06:38 (WEA H5)	21:29
4	08:26	07:58	07:07	07:00		06:01	06:24 (WEA H5)	05:22
	16:39	17:26	18:13	20:03		20:49	14 06:38 (WEA H5)	21:30
5	08:26	07:56	07:05	06:58		05:59	06:22 (WEA H5)	05:22
	16:40	17:27	18:15	20:04		20:51	16 06:38 (WEA H5)	21:31
6	08:25	07:55	07:03	06:56		05:57	06:21 (WEA H5)	05:21
	16:41	17:29	18:17	20:06		20:52	18 06:39 (WEA H5)	21:32
7	08:25	07:53	07:00	06:54		05:56	06:19 (WEA H5)	05:21
	16:43	17:31	18:18	20:07		20:54	20 06:39 (WEA H5)	21:32
8	08:25	07:52	06:58	06:51		05:54	06:18 (WEA H5)	05:20
	16:44	17:33	18:20	20:09		20:55	21 06:39 (WEA H5)	21:33
9	08:24	07:50	06:56	06:49		05:52	06:16 (WEA H5)	05:20
	16:45	17:34	18:22	20:11		20:57	23 06:39 (WEA H5)	21:34
10	08:24	07:48	06:54	06:47		05:51	06:15 (WEA H5)	05:19
	16:46	17:36	18:23	20:12		20:58	24 06:39 (WEA H5)	21:35
11	08:23	07:47	06:52	06:45		05:49	06:15 (WEA H5)	05:19
	16:48	17:38	18:25	20:14		21:00	23 06:38 (WEA H5)	21:36
12	08:23	07:45	06:50	06:43		05:48	06:16 (WEA H5)	05:19
	16:49	17:40	18:26	20:15		21:01	22 06:38 (WEA H5)	21:36
13	08:22	07:43	06:48	06:41		05:46	06:17 (WEA H5)	05:18
	16:50	17:41	18:28	20:17		21:03	21 06:38 (WEA H5)	21:37
14	08:22	07:42	06:46	06:39		05:45	06:16 (WEA H5)	05:18
	16:52	17:43	18:30	20:18		21:04	21 06:37 (WEA H5)	21:37
15	08:21	07:40	06:43	06:37		05:43	06:17 (WEA H5)	05:18
	16:53	17:45	18:31	20:20		21:06	19 06:36 (WEA H5)	21:38
16	08:20	07:38	06:41	06:35		05:42	06:18 (WEA H5)	05:18
	16:55	17:46	18:33	20:22		21:07	18 06:36 (WEA H5)	21:38
17	08:19	07:36	06:39	06:33		05:40	06:19 (WEA H5)	05:18
	16:56	17:48	18:34	20:23		21:08	15 06:34 (WEA H5)	21:39
18	08:18	07:34	06:37	06:31		05:39	06:20 (WEA H5)	05:18
	16:58	17:50	18:36	20:25		21:10	13 06:33 (WEA H5)	21:39
19	08:18	07:32	06:35	06:29		05:38	06:22 (WEA H5)	05:18
	16:59	17:52	18:38	20:26		21:11	10 06:32 (WEA H5)	21:40
20	08:17	07:31	06:33	06:27		05:37	06:26 (WEA H5)	05:18
	17:01	17:53	18:39	20:28		21:12	2 06:28 (WEA H5)	21:40
21	08:16	07:29	06:30	06:25		05:35		05:18
	17:02	17:55	18:41	20:29		21:14		21:40
22	08:15	07:27	06:28	06:23		05:34		05:19
	17:04	17:57	18:42	20:31		21:15		21:40
23	08:14	07:25	06:26	06:21		05:33		05:19
	17:06	17:58	18:44	20:32		21:16		21:40
24	08:12	07:23	06:24	06:19		05:32		05:19
	17:07	18:00	18:46	20:34		21:18		21:41
25	08:11	07:21	06:22	06:17		05:31		05:19
	17:09	18:02	18:47	20:36		21:19		21:41
26	08:10	07:19	06:20	06:15		05:30		05:20
	17:11	18:03	18:49	20:37		21:20		21:41
27	08:09	07:17	06:17	06:13		05:29		05:20
	17:12	18:05	18:50	20:39		21:21		21:41
28	08:08	07:15	06:15	06:11		05:28		05:21
	17:14	18:07	18:52	20:40		21:22		21:41
29	08:06		07:13	06:09		05:27		05:21
	17:16		19:53	20:42		21:24		21:40
30	08:05		07:11	06:08	06:31 (WEA H5)	05:26		05:22
	17:17		19:55	20:43	4 06:35 (WEA H5)	21:25		21:40
31	08:04		07:09			05:25		
	17:19		19:57			21:26		
Sonnenscheinstunden	267	282	368	412		477		488
astr.max.mögl.Beschattung				4		329		
Red.Sonnenscheinwahrsch.				0,40		0,45		
Reduktion Betriebsdauer				0,92		0,92		
Reduktion Windrichtung				0,70		0,70		
Gesamte Reduktion				0,26		0,29		
Met.wahrsch.Beschattung				1		95		

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

Tag im Monat	Sonnenaufgang (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: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 15 - Klein-Winternheim, Hechtsheimer Berg 53
 Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
 1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
 335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
 Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	05:22 21:40	05:56 21:11	06:26 (WEA H5) 20:13	06:41 19:08	07:16 17:06	08:03 16:29
2	05:23 21:40	05:57 21:10	06:25 (WEA H5) 20:11	06:43 19:06	07:17 17:04	08:04 16:29
3	05:24 21:39	05:59 21:08	06:26 (WEA H5) 20:09	06:44 19:04	07:19 17:03	08:06 16:28
4	05:24 21:39	06:00 21:07	06:27 (WEA H5) 20:07	06:46 19:02	07:21 17:01	08:07 16:28
5	05:25 21:39	06:01 21:05	06:28 (WEA H5) 20:05	06:47 18:59	07:22 17:00	08:08 16:27
6	05:26 21:38	06:03 21:03	06:30 (WEA H5) 20:03	06:49 18:57	07:24 16:58	08:09 16:27
7	05:27 21:38	06:04 21:02	06:31 (WEA H5) 20:01	06:50 18:55	07:26 16:56	08:11 16:27
8	05:27 21:37	06:06 21:00	06:32 (WEA H5) 19:59	06:52 18:53	07:27 16:55	08:12 16:27
9	05:28 21:37	06:07 20:58	06:34 (WEA H5) 19:56	06:53 18:51	07:29 16:53	08:13 16:26
10	05:29 21:36	06:09 20:57	06:35 (WEA H5) 19:54	06:55 18:49	07:31 16:52	08:14 16:26
11	05:30 21:35	06:10 20:55	06:36 (WEA H5) 19:52	06:56 18:47	07:32 16:50	08:15 16:26
12	05:31 21:35	06:12 20:53	06:38 (WEA H5) 19:50	06:58 18:45	07:34 16:49	08:16 16:26
13	05:32 21:34	06:13 20:51	06:39 (WEA H5) 19:48	06:59 18:43	07:36 16:48	08:17 16:26
14	05:33 21:33	06:14 20:49	06:42 (WEA H5) 19:45	18:43 18:41	16:48 16:46	16:26 16:26
15	05:34 21:32	06:16 20:48	07:02 19:43	18:48 18:38	16:49 16:45	16:27 16:26
16	05:35 21:31	06:17 20:46	07:04 19:41	18:50 18:36	16:40 16:44	16:27 16:26
17	05:37 21:30	06:19 20:44	07:05 19:39	18:51 18:34	16:42 16:42	16:20 16:26
18	05:38 21:29	06:20 20:42	07:07 19:37	18:53 18:32	16:44 16:41	16:21 16:27
19	05:39 21:28	06:22 20:40	07:08 19:34	18:54 18:30	16:45 16:40	16:22 16:27
20	05:40 21:27	06:23 20:38	07:09 19:32	18:56 18:28	16:47 16:39	16:22 16:27
21	05:41 21:26	06:25 20:36	07:11 19:30	18:58 18:26	16:48 16:38	16:23 16:28
22	05:42 21:25	06:26 20:34	07:12 19:28	18:59 18:25	16:49 16:37	16:24 16:28
23	05:44 21:24	06:28 20:32	07:14 19:26	18:01 18:23	16:51 16:36	16:24 16:29
24	05:45 21:22	06:34 (WEA H5) 06:41 (WEA H5)	06:29 20:30	18:02 18:21	16:53 16:35	16:24 16:29
25	05:46 21:21	06:32 (WEA H5) 06:43 (WEA H5)	06:31 20:28	17:17 17:19	16:54 16:34	16:25 16:30
26	05:48 21:20	06:30 (WEA H5) 06:44 (WEA H5)	06:32 20:26	17:19 17:17	16:56 16:33	16:25 16:31
27	05:49 21:18	06:29 (WEA H5) 06:45 (WEA H5)	06:34 20:24	17:20 17:15	16:57 16:32	16:25 16:31
28	05:50 21:17	06:29 (WEA H5) 06:47 (WEA H5)	06:35 20:22	17:22 17:13	16:59 16:32	16:26 16:32
29	05:52 21:16	06:28 (WEA H5) 06:47 (WEA H5)	06:37 20:20	17:23 17:11	16:00 16:31	16:26 16:33
30	05:53 21:14	06:27 (WEA H5) 06:48 (WEA H5)	06:38 20:18	17:25 17:10	16:02 16:30	16:26 16:34
31	05:54 21:13	06:27 (WEA H5) 06:49 (WEA H5)	06:40 20:16	17:14 17:08	16:30 16:35	16:26 16:35
Sonnenscheinstunden	492	448	380	334	273	254
astr.max.mögl.Beschattung	128	208				
Red.Sonnenscheinwahrsch.	0,46	0,48				
Reduktion Betriebsdauer	0,92	0,92				
Reduktion Windrichtung	0,70	0,70				
Gesamte Reduktion	0,29	0,31				
Met.wahrsch.Beschattung	38	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)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
	Minuten mit Schatten	

Projekt:

Mainz Hechtsheim II

Lizenzierter Anwender:

Juwi AG

Energie-Allee 1

DE-55286 Wörrstadt

Mirjam Wöhlke / mirjam.woehlke@juwi.de

Berechnet:

12.06.2018 08:29/3.1.633

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wön Schattenrezeptor: IO 17 - Klein-Winternheim, Karthause 13
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April	Mai		Juni	Juli	August	September	Oktober	November	Dezember
1	08:26	08:02	07:13	07:06	06:06		05:24	05:22	05:56	06:23 (WEA H5)	06:41	07:26	07:16
	16:36	17:21	18:08	19:58	20:45		21:27	21:40	21:11	06:40 (WEA H5)	20:13	19:08	17:06
2	08:26	08:01	07:11	07:04	06:04		05:24	05:23	05:57	06:24 (WEA H5)	06:43	07:28	07:17
	16:37	17:22	18:10	20:00	20:46		21:28	21:40	21:10	06:39 (WEA H5)	20:11	19:06	17:04
3	08:26	07:59	07:09	07:02	06:02		05:23	05:24	05:59	06:26 (WEA H5)	06:44	07:29	07:19
	16:38	17:24	18:12	20:01	20:48		21:29	21:39	21:08	06:39 (WEA H5)	20:09	19:04	17:03
4	08:26	07:58	07:07	07:00	06:01		05:22	05:24	06:00	06:27 (WEA H5)	06:46	07:31	07:21
	16:39	17:26	18:13	20:03	20:49		21:30	21:39	21:07	06:38 (WEA H5)	20:07	19:02	17:01
5	08:26	07:56	07:05	06:58	05:59		05:22	05:25	06:01	06:28 (WEA H5)	06:47	07:32	07:22
	16:40	17:27	18:15	20:04	20:51		21:31	21:39	21:05	06:36 (WEA H5)	20:05	18:59	17:00
6	08:25	07:55	07:03	06:56	05:57		05:21	05:26	06:03	06:30 (WEA H5)	06:49	07:34	07:24
	16:41	17:29	18:17	20:06	20:52	4	06:25 (WEA H5)	21:32	21:38	21:03	06:36 (WEA H5)	20:03	18:57
7	08:25	07:53	07:00	06:54	05:56		06:19 (WEA H5)	05:21	05:27	06:04	06:31 (WEA H5)	20:00	18:55
	16:43	17:31	18:18	20:07	20:54	7	06:26 (WEA H5)	21:32	21:38	21:02	06:34 (WEA H5)	20:01	18:55
8	08:25	07:52	06:58	06:51	05:54		06:18 (WEA H5)	05:20	05:27	06:06	06:52	07:37	07:27
	16:44	17:33	18:20	20:09	20:55	9	06:27 (WEA H5)	21:33	21:37	21:00	19:59	18:53	16:55
9	08:24	07:50	06:56	06:49	05:52		06:16 (WEA H5)	05:20	05:28	06:07	06:53	07:38	07:29
	16:45	17:34	18:22	20:11	20:57	12	06:28 (WEA H5)	21:34	21:37	20:58	19:56	18:51	16:53
10	08:24	07:48	06:54	06:47	05:51		06:15 (WEA H5)	05:19	05:29	06:09	06:55	07:40	07:31
	16:46	17:36	18:23	20:12	20:58	14	06:29 (WEA H5)	21:35	21:36	20:57	19:54	18:49	16:52
11	08:23	07:47	06:52	06:45	05:49		06:13 (WEA H5)	05:19	05:30	06:10	06:56	07:42	07:32
	16:48	17:38	18:25	20:14	21:00	15	06:28 (WEA H5)	21:35	21:35	20:55	19:52	18:47	16:50
12	08:23	07:45	06:50	06:43	05:48		06:12 (WEA H5)	05:19	05:31	06:12	06:58	07:43	07:34
	16:49	17:40	18:26	20:15	21:01	17	06:29 (WEA H5)	21:36	21:35	20:53	19:50	18:45	16:49
13	08:22	07:43	06:48	06:41	05:46		06:11 (WEA H5)	05:18	05:32	06:13	06:59	07:45	07:36
	16:50	17:41	18:28	20:17	21:03	19	06:30 (WEA H5)	21:37	21:34	20:51	19:48	18:43	16:48
14	08:22	07:42	06:46	06:39	05:45		06:09 (WEA H5)	05:18	05:33	06:14	07:01	07:46	07:37
	16:52	17:43	18:30	20:18	21:04	20	06:29 (WEA H5)	21:37	21:33	20:49	19:45	18:41	16:46
15	08:21	07:40	06:43	06:37	05:43		06:08 (WEA H5)	05:18	05:34	06:16	07:02	07:48	07:39
	16:53	17:45	18:31	20:20	21:06	22	06:30 (WEA H5)	21:38	21:32	5	06:30 (WEA H5)	20:48	19:43
16	08:20	07:38	06:41	06:35	05:42		06:07 (WEA H5)	05:18	05:35	06:17	07:04	07:50	07:40
	16:55	17:46	18:33	20:22	21:07	23	06:30 (WEA H5)	21:38	21:31	9	06:32 (WEA H5)	20:46	19:41
17	08:19	07:36	06:39	06:33	05:40		06:06 (WEA H5)	05:18	05:37	06:19	07:05	07:51	07:42
	16:56	17:48	18:34	20:23	21:08	23	06:29 (WEA H5)	21:39	21:30	12	06:34 (WEA H5)	20:44	19:39
18	08:18	07:34	06:37	06:31	05:39		06:06 (WEA H5)	05:18	05:38	06:20	07:07	07:53	07:44
	16:58	17:50	18:36	20:25	21:10	23	06:29 (WEA H5)	21:39	21:29	14	06:35 (WEA H5)	20:42	19:37
19	08:18	07:32	06:35	06:29	05:38		06:07 (WEA H5)	05:18	05:39	06:20	07:08	07:54	07:45
	16:59	17:52	18:38	20:26	21:11	22	06:29 (WEA H5)	21:40	21:28	16	06:36 (WEA H5)	20:40	19:34
20	08:17	07:31	06:33	06:27	05:37		06:07 (WEA H5)	05:18	05:40	06:19	07:09	07:56	07:47
	17:01	17:53	18:39	20:28	21:12	22	06:29 (WEA H5)	21:40	21:27	18	06:37 (WEA H5)	20:38	19:32
21	08:16	07:29	06:30	06:25	05:35		06:08 (WEA H5)	05:18	05:41	06:18	07:11	07:58	07:48
	17:02	17:55	18:41	20:29	21:14	20	06:28 (WEA H5)	21:40	21:26	19	06:37 (WEA H5)	20:36	19:30
22	08:15	07:27	06:28	06:23	05:34		06:09 (WEA H5)	05:19	05:42	06:18	07:12	07:59	07:50
	17:04	17:57	18:42	20:31	21:15	19	06:28 (WEA H5)	21:40	21:25	20	06:38 (WEA H5)	20:34	19:28
23	08:14	07:25	06:26	06:21	05:33		06:09 (WEA H5)	05:19	05:44	06:18	07:14	08:01	07:51
	17:06	17:58	18:44	20:32	21:16	18	06:27 (WEA H5)	21:40	21:24	21	06:39 (WEA H5)	20:32	19:26
24	08:12	07:23	06:24	06:19	05:32		06:10 (WEA H5)	05:19	05:45	06:18	07:15	08:02	07:53
	17:07	18:00	18:46	20:34	21:18	17	06:27 (WEA H5)	21:41	21:22	21	06:39 (WEA H5)	20:30	19:23
25	08:11	07:21	06:22	06:17	05:31		06:11 (WEA H5)	05:19	05:46	06:17	07:17	07:04	07:54
	17:09	18:02	18:47	20:36	21:19	15	06:26 (WEA H5)	21:41	21:21	22	06:39 (WEA H5)	20:28	19:21
26	08:10	07:19	06:20	06:15	05:30		06:12 (WEA H5)	05:20	05:48	06:17	07:19	07:06	07:56
	17:11	18:03	18:49	20:37	21:20	13	06:25 (WEA H5)	21:41	21:20	22	06:39 (WEA H5)	20:26	19:19
27	08:09	07:17	06:17	06:13	05:29		06:13 (WEA H5)	05:20	05:49	06:16	07:20	07:07	07:57
	17:12	18:05	18:50	20:39	21:21	11	06:24 (WEA H5)	21:41	21:18	23	06:39 (WEA H5)	20:24	19:17
28	08:08	07:15	06:15	06:11	05:28		06:15 (WEA H5)	05:21	05:50	06:18	07:22	07:09	07:59
	17:14	18:07	18:52	20:40	21:22	7	06:22 (WEA H5)	21:41	21:17	22	06:40 (WEA H5)	20:22	19:15
29	08:06		07:13	06:09	05:27		05:21	05:52	06:19	06:37	07:23	07:11	08:00
	17:16		19:53	20:42	21:24		21:40	21:16	21:12	06:40 (WEA H5)	20:20	19:12	17:11
30	08:05		07:11	06:08	05:26		05:22	05:53	06:20	06:38	07:25	07:12	08:02
	17:17		19:55	20:43	21:25		21:40	21:14	20	06:40 (WEA H5)	20:18	19:10	17:10
31	08:04		07:09		05:25			05:54	06:22	06:40	07:14	07:08	08:26
	17:19		19:57		21:26			21:13	18	06:40 (WEA H5)	20:16	17:08	16:35
Sonnenscheinstunden	267	282	368	412	477		488	492	448		380	334	273
astr.max.mögl.Beschattung					372			303			73		254
Red.Sonnenscheinwahrsch.					0,45			0,46			0,48		
Reduktion Betriebsdauer					0,92			0,92			0,92		
Reduktion Windrichtung					0,70			0,70			0,70		
Gesamte Reduktion					0,29			0,30			0,31		
Met.wahrsch.Beschattung					108			90			23		

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

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

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm Schattenrezeptor: IO 18 - Klein-Winternheim, Hechtsheimer Berg 57
 Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]

Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
 1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N NNO ONO O OSO SSO S SSW WSW W WNW NNW Summe
 335 502 703 682 487 528 701 1.072 1.337 901 465 321 8.033
 Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Januar	Februar	März	April		Mai		Juni
1	08:26	08:02	07:13	07:06		06:06	06:29 (WEA H5)	05:24
	16:36	17:21	18:08	19:58		20:45	15 06:44 (WEA H5)	21:27
2	08:26	08:01	07:11	07:04		06:04	06:27 (WEA H5)	05:24
	16:37	17:22	18:10	20:00		20:46	17 06:44 (WEA H5)	21:28
3	08:26	07:59	07:09	07:02		06:02	06:26 (WEA H5)	05:23
	16:38	17:24	18:12	20:01		20:48	19 06:45 (WEA H5)	21:29
4	08:26	07:58	07:07	07:00		06:01	06:24 (WEA H5)	05:22
	16:39	17:26	18:13	20:03		20:49	21 06:45 (WEA H5)	21:30
5	08:26	07:56	07:05	06:58		05:59	06:22 (WEA H5)	05:22
	16:40	17:27	18:15	20:04		20:51	22 06:44 (WEA H5)	21:31
6	08:25	07:55	07:03	06:56		05:57	06:21 (WEA H5)	05:21
	16:41	17:29	18:17	20:06		20:52	23 06:44 (WEA H5)	21:32
7	08:25	07:53	07:00	06:54		05:56	06:21 (WEA H5)	05:21
	16:43	17:31	18:18	20:07		20:54	23 06:44 (WEA H5)	21:32
8	08:25	07:52	06:58	06:51		05:54	06:22 (WEA H5)	05:20
	16:44	17:33	18:20	20:09		20:55	22 06:44 (WEA H5)	21:33
9	08:24	07:50	06:56	06:49		05:52	06:22 (WEA H5)	05:20
	16:45	17:34	18:22	20:11		20:57	21 06:43 (WEA H5)	21:34
10	08:24	07:48	06:54	06:47		05:51	06:23 (WEA H5)	05:19
	16:46	17:36	18:23	20:12		20:58	19 06:42 (WEA H5)	21:35
11	08:23	07:47	06:52	06:45		05:49	06:23 (WEA H5)	05:19
	16:48	17:38	18:25	20:14		21:00	18 06:41 (WEA H5)	21:36
12	08:23	07:45	06:50	06:43		05:48	06:25 (WEA H5)	05:19
	16:49	17:40	18:26	20:15		21:01	15 06:40 (WEA H5)	21:36
13	08:22	07:43	06:48	06:41		05:46	06:26 (WEA H5)	05:18
	16:50	17:41	18:28	20:17		21:03	13 06:39 (WEA H5)	21:37
14	08:22	07:42	06:46	06:39		05:45	06:28 (WEA H5)	05:18
	16:52	17:43	18:30	20:18		21:04	9 06:37 (WEA H5)	21:37
15	08:21	07:40	06:43	06:37		05:43		05:18
	16:53	17:45	18:31	20:20		21:06		21:38
16	08:20	07:38	06:41	06:35		05:42		05:18
	16:55	17:46	18:33	20:22		21:07		21:38
17	08:19	07:36	06:39	06:33		05:40		05:18
	16:56	17:48	18:34	20:23		21:08		21:39
18	08:18	07:34	06:37	06:31		05:39		05:18
	16:58	17:50	18:36	20:25		21:10		21:39
19	08:18	07:32	06:35	06:29		05:38		05:18
	16:59	17:52	18:38	20:26		21:11		21:40
20	08:17	07:31	06:33	06:27		05:37		05:18
	17:01	17:53	18:39	20:28		21:12		21:40
21	08:16	07:29	06:30	06:25		05:35		05:18
	17:02	17:55	18:41	20:29		21:14		21:40
22	08:15	07:27	06:28	06:23		05:34		05:19
	17:04	17:57	18:42	20:31		21:15		21:40
23	08:14	07:25	06:26	06:21		05:33		05:19
	17:06	17:58	18:44	20:32		21:16		21:40
24	08:13	07:23	06:24	06:19		05:32		05:19
	17:07	18:00	18:46	20:34		21:18		21:41
25	08:11	07:21	06:22	06:17		05:31		05:19
	17:09	18:02	18:47	20:36		21:19		21:41
26	08:10	07:19	06:20	06:15	06:38 (WEA H5)	05:30		05:20
	17:11	18:03	18:49	20:37	2 06:40 (WEA H5)	21:20		21:41
27	08:09	07:17	06:17	06:13	06:36 (WEA H5)	05:29		05:20
	17:12	18:05	18:50	20:39	5 06:41 (WEA H5)	21:21		21:41
28	08:08	07:15	06:15	06:11	06:34 (WEA H5)	05:28		05:21
	17:14	18:07	18:52	20:40	8 06:42 (WEA H5)	21:22		21:41
29	08:06		07:13	06:09	06:32 (WEA H5)	05:27		05:21
	17:16		19:53	20:42	11 06:43 (WEA H5)	21:24		21:40
30	08:05		07:11	06:08	06:31 (WEA H5)	05:26		05:22
	17:17		19:55	20:43	13 06:44 (WEA H5)	21:25		21:40
31	08:04		07:09			05:25		
	17:19		19:57			21:26		
Sonnenscheinstunden	267	282	368	412		477		488
astr.max.mögl.Beschattung				39		257		
Red.Sonnenscheinwahrsch.				0,40		0,45		
Reduktion Betriebsdauer				0,92		0,92		
Reduktion Windrichtung				0,69		0,69		
Gesamte Reduktion				0,25		0,28		
Met.wahrsch.Beschattung				10		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	Schattenende (WEA mit letztem Schatten)

SHADOW - Kalender

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wömSchattenrezeptor: IO 18 - Klein-Winternheim, Hechtsheimer Berg 57
Voraussetzungen für Berechnung des Schattenwurfs Sonnenscheinwahrscheinlichkeit S (Mittlere tägliche Sonnenstunden) [GEISENHEIM]Jan Feb Mär Apr Mai Jun Jul Aug Sep Okt Nov Dez
1,48 2,93 3,80 5,50 6,94 6,23 7,34 6,96 5,12 2,77 1,83 1,21

Betriebsdauer je Sektor

N	NNO	ONO	O	OSO	SSO	S	SSW	WSW	W	WNW	NNW	Summe
335	502	703	682	487	528	701	1.072	1.337	901	465	321	8.033

Startwindgeschwindigkeit: Startwindgeschw. aus Leistungskennlinie

	Juli	August	September	Oktober	November	Dezember
1	05:22 21:40	05:56 21:11	06:35 (WEA H5) 06:51 (WEA H5)	06:41 20:13	07:26 19:08	08:03 16:29
2	05:23 21:40	05:57 21:10	06:33 (WEA H5) 06:52 (WEA H5)	06:43 20:11	07:28 19:06	08:04 16:29
3	05:24 21:39	05:59 21:08	06:33 (WEA H5) 06:53 (WEA H5)	06:44 20:09	07:29 19:04	08:06 16:28
4	05:24 21:39	06:00 21:07	06:32 (WEA H5) 06:53 (WEA H5)	06:46 20:07	07:31 19:02	08:07 16:28
5	05:25 21:39	06:01 21:05	06:31 (WEA H5) 06:53 (WEA H5)	06:47 20:05	07:32 18:59	08:08 16:27
6	05:26 21:38	06:03 21:03	06:32 (WEA H5) 06:54 (WEA H5)	06:49 20:03	07:34 18:57	08:09 16:27
7	05:27 21:38	06:04 21:02	06:31 (WEA H5) 06:54 (WEA H5)	06:50 20:01	07:35 18:55	08:11 16:27
8	05:27 21:37	06:06 21:00	06:32 (WEA H5) 06:54 (WEA H5)	06:52 19:59	07:37 18:53	08:12 16:27
9	05:28 21:37	06:07 20:58	06:34 (WEA H5) 06:54 (WEA H5)	06:53 19:56	07:38 18:51	08:13 16:26
10	05:29 21:36	06:09 20:57	06:35 (WEA H5) 06:54 (WEA H5)	06:55 19:54	07:40 18:49	08:14 16:26
11	05:30 21:35	06:10 20:55	06:36 (WEA H5) 06:53 (WEA H5)	06:56 19:52	07:42 18:47	08:15 16:26
12	05:31 21:35	06:12 20:53	06:38 (WEA H5) 06:53 (WEA H5)	06:58 19:50	07:43 18:45	08:16 16:26
13	05:32 21:34	06:13 20:51	06:39 (WEA H5) 06:52 (WEA H5)	06:59 19:48	07:45 18:43	08:17 16:26
14	05:33 21:33	06:14 20:49	06:41 (WEA H5) 06:51 (WEA H5)	07:01 19:45	07:46 18:41	08:18 16:26
15	05:34 21:32	06:16 20:48	06:42 (WEA H5) 06:50 (WEA H5)	07:02 19:43	07:48 18:38	08:19 16:26
16	05:35 21:31	06:17 20:46	06:43 (WEA H5) 06:48 (WEA H5)	07:04 19:41	07:50 18:36	08:19 16:26
17	05:37 21:30	06:19 20:44	06:45 (WEA H5) 06:46 (WEA H5)	07:05 19:39	07:51 18:34	08:20 16:26
18	05:38 21:29	06:20 20:42		07:07 19:37	07:53 18:32	08:21 16:27
19	05:39 21:28	06:22 20:40		07:08 19:34	07:54 18:30	08:22 16:27
20	05:40 21:27	06:23 20:38		07:09 19:32	07:56 18:28	08:22 16:27
21	05:41 21:26	06:25 20:36		07:11 19:30	07:58 18:26	08:23 16:28
22	05:42 21:25	06:26 20:34		07:12 19:28	07:59 18:25	08:23 16:28
23	05:44 21:24	06:28 20:32		07:14 19:26	08:01 18:23	08:24 16:29
24	05:45 21:22	06:29 20:30		07:16 19:23	08:02 18:21	08:24 16:29
25	05:46 21:21	06:31 20:28		07:17 19:21	08:04 17:19	08:25 16:30
26	05:48 21:20	06:32 20:26		07:19 19:19	08:06 17:17	08:25 16:31
27	05:49 21:18	06:34 20:24		07:20 19:17	08:07 17:15	08:25 16:31
28	05:50 21:17	06:35 20:22		07:22 19:15	08:09 17:13	08:26 16:32
29	05:52 21:16	06:37 20:20	06:40 (WEA H5) 06:45 (WEA H5)	07:23 19:12	08:11 17:11	08:26 16:33
30	05:53 21:14	06:37 (WEA H5) 06:48 (WEA H5)	06:38 20:18	07:25 19:10	08:12 17:10	08:26 16:34
31	05:54 21:13	06:36 (WEA H5) 06:50 (WEA H5)	06:40 20:16		07:14 17:08	08:26 16:35
Sonnenscheinstunden	492	448		380	334	254
astr.max.mögl.Beschattung	30	273				
Red.Sonnenscheinwahrsch.	0,46	0,48				
Reduktion Betriebsdauer	0,92	0,92				
Reduktion Windrichtung	0,69	0,69				
Gesamte Reduktion	0,29	0,30				
Met.wahrsch.Beschattung	9	83				

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

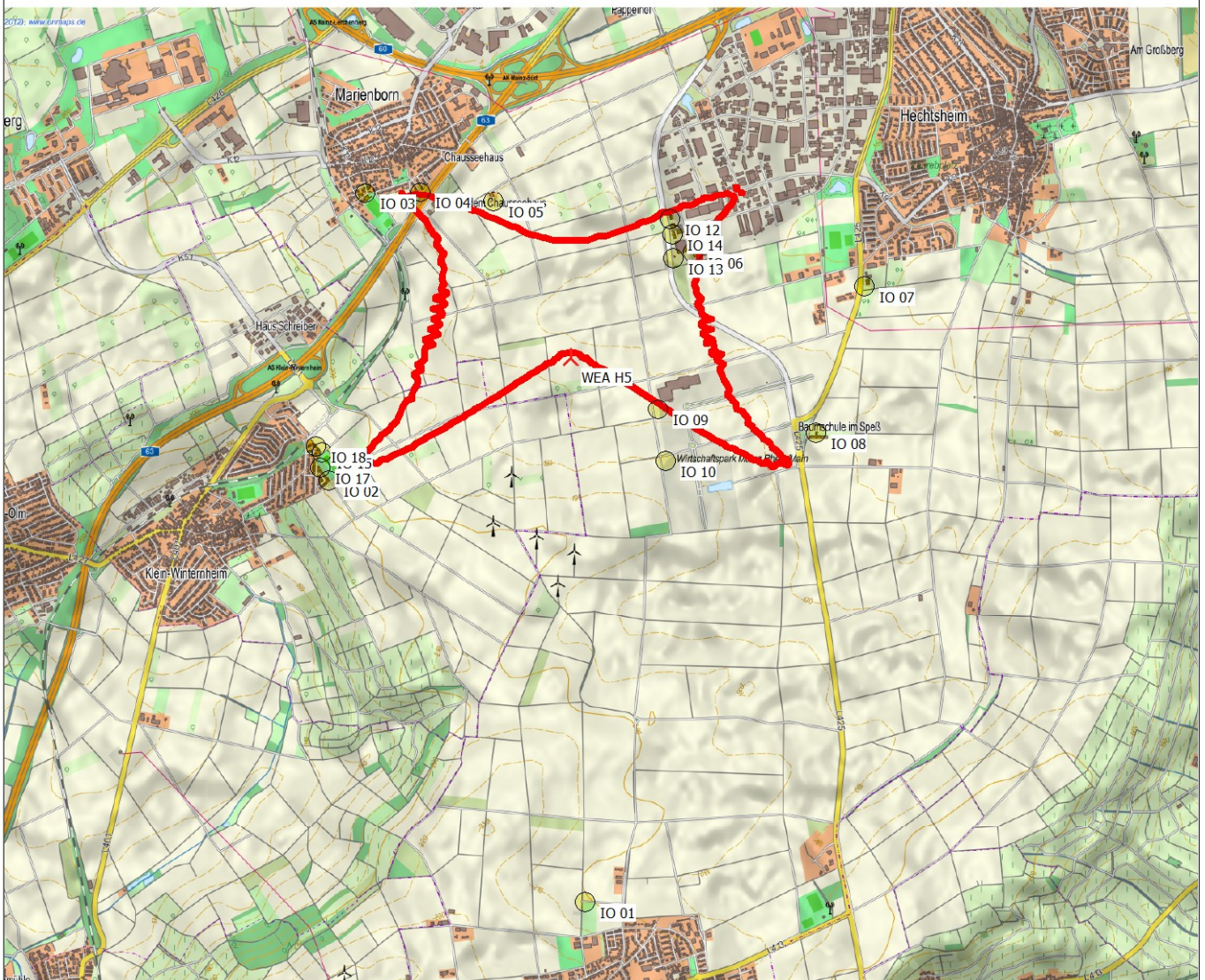
Tag im Monat	Sonnenaufgang (SS:MM)	Sonnenuntergang (SS:MM)	Minuten mit Schatten	Zeitpunkt (SS:MM) Schattenanfang (WEA mit erstem Schatten)	Zeitpunkt (SS:MM) Schattenende (WEA mit letztem Schatten)
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SHADOW - Karte

Berechnung: 180612_Mainz-Hechtsheim II_ZB_1xGE5.3_NH161_ohne IO1116AB_wöm

Stunden/Jahr,
Astron.max.mögl.

30 Stunden



0 500 1000 1500 2000 m

Karte: TK 25k , Maßstab 1:40.000, Mitte: ETRS 89 Zone: 32 Ost: 445.980 Nord: 5.532.816

Neue WEA

Schattenrezeptor

Höhe der Schattenkarte: Höhenraster-Objekt (23)