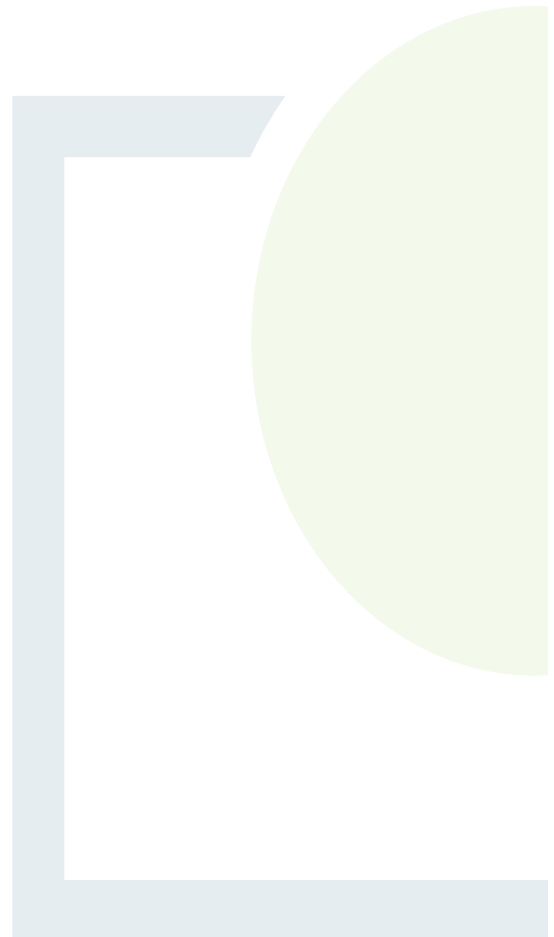




CONSULTANTS IN
ENGINEERING,
ENVIRONMENTAL SCIENCE &
PLANNING

Appendix 12.1

Shadow Flicker
Modelling Input Data



Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
1	Dwelling	561700	589779	1-1	-4	0	16	2	1.1	0	274
				1-2	1	8	9	2	1.1	0	4
				1-3	4	0	16	2	1.1	0	94
				1-4	-1	-8	9	2	1.1	0	184
2	Dwelling	562234	591344	2-1	-7	4	16	2	1.1	0	304
				2-2	4	7	16	2	1.1	0	34
				2-3	7	-4	16	2	1.1	0	124
				2-4	-4	-7	16	2	1.1	0	214
3	Dwelling	562303	591259	3-1	-8	6	13	2	1.1	0	309
				3-2	4	5	20	2	1.1	0	39
				3-3	8	-6	13	2	1.1	0	129
				3-4	-4	-5	20	2	1.1	0	219
4	Dwelling	562401	591238	4-1	-7	5	10	2	1.1	0	303
				4-2	3	4	17	2	1.1	0	33
				4-3	7	-5	10	2	1.1	0	123
				4-4	-3	-4	17	2	1.1	0	213
5	Dwelling	562467	591161	5-1	-1	6	10	2	1.1	0	350
				5-2	5	1	12	2	1.1	0	80
				5-3	1	-6	10	2	1.1	0	170
				5-4	-5	-1	12	2	1.1	0	260
6	Dwelling	562568	592193	6-1	-3	1	16	2	1.1	0	298
				6-2	4	7	6	2	1.1	0	28
				6-3	3	-1	16	2	1.1	0	118
				6-4	-4	-7	6	2	1.1	0	208
7	Dwelling	562620	592352	7-1	0	3	10	2	1.1	0	355
				7-2	5	0	6	2	1.1	0	85
				7-3	0	-3	10	2	1.1	0	175
				7-4	-5	0	6	2	1.1	0	265
8	Dwelling	562639	591230	8-1	-2	6	6	2	1.1	0	338
				8-2	3	1	12	2	1.1	0	68
				8-3	2	-6	6	2	1.1	0	158
				8-4	-3	-1	12	2	1.1	0	248
9	Dwelling	562669	591125	9-1	-6	1	17	2	1.1	0	283
				9-2	2	8	12	2	1.1	0	13
				9-3	6	-1	17	2	1.1	0	103
				9-4	-2	-8	12	2	1.1	0	193
10	Dwelling	562680	592401	10-1	-1	8	9	2	1.1	0	350
				10-2	4	1	16	2	1.1	0	80
				10-3	1	-8	9	2	1.1	0	170
				10-4	-4	-1	16	2	1.1	0	260

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
11	Dwelling	562687	592664	11-1	-1	5	6	2	1.1	0	345
				11-2	3	1	11	2	1.1	0	75
				11-3	1	-5	6	2	1.1	0	165
				11-4	-3	-1	11	2	1.1	0	255
12	Dwelling	562701	591670	12-1	-4	3	15	2	1.1	0	300
				12-2	4	7	10	2	1.1	0	30
				12-3	4	-3	15	2	1.1	0	120
				12-4	-4	-7	10	2	1.1	0	210
13	Dwelling	562721	591696	13-1	-7	4	16	2	1.1	0	300
				13-2	4	7	15	2	1.1	0	30
				13-3	7	-4	16	2	1.1	0	120
				13-4	-4	-7	15	2	1.1	0	210
14	Dwelling	562725	591740	14-1	-4	2	22	2	1.1	0	296
				14-2	5	10	10	2	1.1	0	26
				14-3	4	-2	22	2	1.1	0	116
				14-4	-5	-10	10	2	1.1	0	206
15	Dwelling	562734	592202	15-1	0	7	10	2	1.1	0	358
				15-2	5	0	13	2	1.1	0	88
				15-3	0	-7	10	2	1.1	0	178
				15-4	-5	0	13	2	1.1	0	268
16	Dwelling	562734	592466	16-1	-1	6	9	2	1.1	0	355
				16-2	4	0	13	2	1.1	0	85
				16-3	1	-6	9	2	1.1	0	175
				16-4	-4	0	13	2	1.1	0	265
17	Dwelling	562758	592346	17-1	-3	7	9	2	1.1	0	336
				17-2	4	2	16	2	1.1	0	66
				17-3	3	-7	9	2	1.1	0	156
				17-4	-4	-2	16	2	1.1	0	246
18	Dwelling	562768	591871	18-1	-5	2	18	2	1.1	0	290
				18-2	3	8	10	2	1.1	0	20
				18-3	5	-2	18	2	1.1	0	110
				18-4	-3	-8	10	2	1.1	0	200
19	Dwelling	562774	592302	19-1	-1	3	12	2	1.1	0	347
				19-2	6	1	6	2	1.1	0	77
				19-3	1	-3	12	2	1.1	0	167
				19-4	-6	-1	6	2	1.1	0	257
20	Dwelling	563032	593040	20-1	-2	5	24	2	1.1	0	342
				20-2	11	4	10	2	1.1	0	72
				20-3	2	-5	24	2	1.1	0	162
				20-4	-11	-4	10	2	1.1	0	252

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
21	Dwelling	563052	591927	21-1	-3	1	10	2	1.1	0	284
				21-2	1	5	6	2	1.1	0	14
				21-3	3	-1	10	2	1.1	0	104
				21-4	-1	-5	6	2	1.1	0	194
22	Dwelling	563055	591937	22-1	-3	1	10	2	1.1	0	284
				22-2	1	5	6	2	1.1	0	14
				22-3	3	-1	10	2	1.1	0	104
				22-4	-1	-5	6	2	1.1	0	194
23	Dwelling	563075	593045	23-1	-2	5	22	2	1.1	0	342
				23-2	10	3	10	2	1.1	0	72
				23-3	2	-5	22	2	1.1	0	162
				23-4	-10	-3	10	2	1.1	0	252
24	Dwelling	563092	591923	24-1	-3	1	14	2	1.1	0	285
				24-2	2	7	6	2	1.1	0	15
				24-3	3	-1	14	2	1.1	0	105
				24-4	-2	-7	6	2	1.1	0	195
25	Dwelling	563165	593153	25-1	-4	1	13	2	1.1	0	277
				25-2	1	6	9	2	1.1	0	7
				25-3	4	-1	13	2	1.1	0	97
				25-4	-1	-6	9	2	1.1	0	187
26	Dwelling	563228	593228	26-1	-4	4	15	2	1.1	0	315
				26-2	5	5	10	2	1.1	0	45
				26-3	4	-4	15	2	1.1	0	135
				26-4	-5	-5	10	2	1.1	0	225
27	Dwelling	563273	593269	27-1	-4	6	20	2	1.1	0	322
				27-2	8	6	14	2	1.1	0	52
				27-3	4	-6	20	2	1.1	0	142
				27-4	-8	-6	14	2	1.1	0	232
28	Dwelling	563375	593784	28-1	-2	8	8	2	1.1	0	342
				28-2	4	1	16	2	1.1	0	72
				28-3	2	-8	8	2	1.1	0	162
				28-4	-4	-1	16	2	1.1	0	252
29	Dwelling	563427	588573	29-1	-4	2	16	2	1.1	0	301
				29-2	4	7	9	2	1.1	0	31
				29-3	4	-2	16	2	1.1	0	121
				29-4	-4	-7	9	2	1.1	0	211
30	Dwelling	563445	593694	30-1	-6	0	18	2	1.1	0	274
				30-2	1	9	12	2	1.1	0	4
				30-3	6	0	18	2	1.1	0	94
				30-4	-1	-9	12	2	1.1	0	184

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
31	Office	563461	589923	31-1	-6	13	22	2	1.1	0	336
				31-2	10	4	28	2	1.1	0	66
				31-3	6	-13	22	2	1.1	0	156
				31-4	-10	-4	28	2	1.1	0	246
32	Dwelling	563640	593549	32-1	-5	1	13	2	1.1	0	283
				32-2	1	6	11	2	1.1	0	13
				32-3	5	-1	13	2	1.1	0	103
				32-4	-1	-6	11	2	1.1	0	193
33	Dwelling	564135	593568	33-1	0	3	12	2	1.1	0	359
				33-2	6	0	6	2	1.1	0	89
				33-3	0	-3	12	2	1.1	0	179
				33-4	-6	0	6	2	1.1	0	269
34	Dwelling	565109	593612	34-1	-5	6	17	2	1.1	0	317
				34-2	6	6	16	2	1.1	0	47
				34-3	5	-6	17	2	1.1	0	137
				34-4	-6	-6	16	2	1.1	0	227
35	Dwelling	565181	593496	35-1	-5	6	8	2	1.1	0	322
				35-2	3	2	15	2	1.1	0	52
				35-3	5	-6	8	2	1.1	0	142
				35-4	-3	-2	15	2	1.1	0	232
36	Dwelling	565255	590371	36-1	-1	8	15	2	1.1	0	350
				36-2	7	1	17	2	1.1	0	80
				36-3	1	-8	15	2	1.1	0	170
				36-4	-7	-1	17	2	1.1	0	260
37	Dwelling	565372	590222	37-1	-4	3	16	2	1.1	0	305
				37-2	5	7	9	2	1.1	0	35
				37-3	4	-3	16	2	1.1	0	125
				37-4	-5	-7	9	2	1.1	0	215
38	Dwelling	565417	590279	38-1	-6	4	9	2	1.1	0	306
				38-2	3	4	14	2	1.1	0	36
				38-3	6	-4	9	2	1.1	0	126
				38-4	-3	-4	14	2	1.1	0	216
39	Dwelling	565502	590140	39-1	-5	7	10	2	1.1	0	325
				39-2	4	3	18	2	1.1	0	55
				39-3	5	-7	10	2	1.1	0	145
				39-4	-4	-3	18	2	1.1	0	235
40	Dwelling	565537	590073	40-1	-5	7	10	2	1.1	0	325
				40-2	4	3	18	2	1.1	0	55
				40-3	5	-7	10	2	1.1	0	145
				40-4	-4	-3	18	2	1.1	0	235

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
41	Dwelling	565926	591755	41-1	-2	2	22	2	1.1	0	308
				41-2	7	9	6	2	1.1	0	38
				41-3	2	-2	22	2	1.1	0	128
				41-4	-7	-9	6	2	1.1	0	218
42	Dwelling	565949	591741	42-1	-4	3	15	2	1.1	0	305
				42-2	4	6	9	2	1.1	0	35
				42-3	4	-3	15	2	1.1	0	125
				42-4	-4	-6	9	2	1.1	0	215
43	Dwelling	565974	592159	43-1	-1	4	18	2	1.1	0	352
				43-2	9	1	8	2	1.1	0	82
				43-3	1	-4	18	2	1.1	0	172
				43-4	-9	-1	8	2	1.1	0	262
44	Dwelling	565989	591469	44-1	-1	5	12	2	1.1	0	350
				44-2	6	1	10	2	1.1	0	80
				44-3	1	-5	12	2	1.1	0	170
				44-4	-6	-1	10	2	1.1	0	260
45	Dwelling	566010	591724	45-1	-7	6	6	2	1.1	0	308
				45-2	2	2	18	2	1.1	0	38
				45-3	7	-6	6	2	1.1	0	128
				45-4	-2	-2	18	2	1.1	0	218
46	Dwelling	566085	591683	46-1	-7	6	9	2	1.1	0	309
				46-2	3	4	18	2	1.1	0	39
				46-3	7	-6	9	2	1.1	0	129
				46-4	-3	-4	18	2	1.1	0	219
47	Dwelling	566116	591659	47-1	-4	3	20	2	1.1	0	306
				47-2	6	8	10	2	1.1	0	36
				47-3	4	-3	20	2	1.1	0	126
				47-4	-6	-8	10	2	1.1	0	216
48	Dwelling	566123	591597	48-1	-10	1	9	2	1.1	0	278
				48-2	1	4	20	2	1.1	0	8
				48-3	10	-1	9	2	1.1	0	98
				48-4	-1	-4	20	2	1.1	0	188
49	Office	566156	592518	49-1	-5	4	5	2	1.1	0	304
				49-2	1	2	13	2	1.1	0	34
				49-3	5	-4	5	2	1.1	0	124
				49-4	-1	-2	13	2	1.1	0	214
50	Dwelling	566205	591339	50-1	-4	1	26	2	1.1	0	282
				50-2	3	13	9	2	1.1	0	12
				50-3	4	-1	26	2	1.1	0	102
				50-4	-3	-13	9	2	1.1	0	192

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
51	Dwelling	566221	591561	51-1	-1	5	16	2	1.1	0	352
				51-2	8	1	10	2	1.1	0	82
				51-3	1	-5	16	2	1.1	0	172
				51-4	-8	-1	10	2	1.1	0	262
52	Dwelling	566544	593365	52-1	-11	3	10	2	1.1	0	286
				52-2	1	5	22	2	1.1	0	16
				52-3	11	-3	10	2	1.1	0	106
				52-4	-1	-5	22	2	1.1	0	196
53	Dwelling	566562	593714	53-1	-9	6	16	2	1.1	0	304
				53-2	4	7	22	2	1.1	0	34
				53-3	9	-6	16	2	1.1	0	124
				53-4	-4	-7	22	2	1.1	0	214
54	Dwelling	566710	593596	54-1	-3	1	18	2	1.1	0	282
				54-2	2	9	6	2	1.1	0	12
				54-3	3	-1	18	2	1.1	0	102
				54-4	-2	-9	6	2	1.1	0	192
55	Dwelling	566816	593451	55-1	-7	7	10	2	1.1	0	312
				55-2	3	4	20	2	1.1	0	42
				55-3	7	-7	10	2	1.1	0	132
				55-4	-3	-4	20	2	1.1	0	222
56	Dwelling	566894	593327	56-1	-3	2	13	2	1.1	0	305
				56-2	4	5	8	2	1.1	0	35
				56-3	3	-2	13	2	1.1	0	125
				56-4	-4	-5	8	2	1.1	0	215
57	Dwelling	567025	593340	57-1	-7	4	9	2	1.1	0	300
				57-2	2	4	15	2	1.1	0	30
				57-3	7	-4	9	2	1.1	0	120
				57-4	-2	-4	15	2	1.1	0	210
58	Dwelling	567070	593074	58-1	-10	3	12	2	1.1	0	285
				58-2	2	6	20	2	1.1	0	15
				58-3	10	-3	12	2	1.1	0	105
				58-4	-2	-6	20	2	1.1	0	195
59	Dwelling	567084	593311	59-1	-7	3	9	2	1.1	0	294
				59-2	2	4	16	2	1.1	0	24
				59-3	7	-3	9	2	1.1	0	114
				59-4	-2	-4	16	2	1.1	0	204
60	Dwelling	567129	591916	60-1	-7	0	6	2	1.1	0	272
				60-2	0	3	14	2	1.1	0	2
				60-3	7	0	6	2	1.1	0	92
				60-4	0	-3	14	2	1.1	0	182

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
61	Dwelling	567150	593198	61-1	-6	4	12	2	1.1	0	306
				61-2	4	5	15	2	1.1	0	36
				61-3	6	-4	12	2	1.1	0	126
				61-4	-4	-5	15	2	1.1	0	216
62	Dwelling	567274	590969	62-1	-5	3	12	2	1.1	0	297
				62-2	3	5	11	2	1.1	0	27
				62-3	5	-3	12	2	1.1	0	117
				62-4	-3	-5	11	2	1.1	0	207
63	Dwelling	567285	590810	63-1	-5	9	16	2	1.1	0	330
				63-2	7	4	20	2	1.1	0	60
				63-3	5	-9	16	2	1.1	0	150
				63-4	-7	-4	20	2	1.1	0	240
64	Dwelling	567291	590969	64-1	-4	2	6	2	1.1	0	296
				64-2	1	3	10	2	1.1	0	26
				64-3	4	-2	6	2	1.1	0	116
				64-4	-1	-3	10	2	1.1	0	206
65	Dwelling	567294	593195	65-1	-8	6	10	2	1.1	0	305
				65-2	3	4	20	2	1.1	0	35
				65-3	8	-6	10	2	1.1	0	125
				65-4	-3	-4	20	2	1.1	0	215
66	Dwelling	567493	592481	66-1	-4	9	10	2	1.1	0	337
				66-2	5	2	20	2	1.1	0	67
				66-3	4	-9	10	2	1.1	0	157
				66-4	-5	-2	20	2	1.1	0	247
67	Dwelling	567514	591914	67-1	-10	2	14	2	1.1	0	280
				67-2	1	7	21	2	1.1	0	10
				67-3	10	-2	14	2	1.1	0	100
				67-4	-1	-7	21	2	1.1	0	190
68	Dwelling	567629	591282	68-1	-8	2	10	2	1.1	0	283
				68-2	1	5	16	2	1.1	0	13
				68-3	8	-2	10	2	1.1	0	103
				68-4	-1	-5	16	2	1.1	0	193
69	Dwelling	567651	591264	69-1	-7	1	8	2	1.1	0	281
				69-2	1	4	15	2	1.1	0	11
				69-3	7	-1	8	2	1.1	0	101
				69-4	-1	-4	15	2	1.1	0	191
70	Dwelling	567829	592466	70-1	-3	1	14	2	1.1	0	284
				70-2	2	7	7	2	1.1	0	14
				70-3	3	-1	14	2	1.1	0	104
				70-4	-2	-7	7	2	1.1	0	194

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
71	Dwelling	567972	590789	71-1	-5	6	8	2	1.1	0	324
				71-2	3	2	16	2	1.1	0	54
				71-3	5	-6	8	2	1.1	0	144
				71-4	-3	-2	16	2	1.1	0	234
72	Dwelling	568217	590453	72-1	-9	3	12	2	1.1	0	290
				72-2	2	6	20	2	1.1	0	20
				72-3	9	-3	12	2	1.1	0	110
				72-4	-2	-6	20	2	1.1	0	200
73	Dwelling	568253	590437	73-1	-7	3	14	2	1.1	0	291
				73-2	3	7	14	2	1.1	0	21
				73-3	7	-3	14	2	1.1	0	111
				73-4	-3	-7	14	2	1.1	0	201
74	Dwelling	568545	590358	74-1	-4	4	6	2	1.1	0	315
				74-2	2	2	12	2	1.1	0	45
				74-3	4	-4	6	2	1.1	0	135
				74-4	-2	-2	12	2	1.1	0	225
75	Dwelling	568642	590465	75-1	-1	9	14	2	1.1	0	356
				75-2	7	0	18	2	1.1	0	86
				75-3	1	-9	14	2	1.1	0	176
				75-4	-7	0	18	2	1.1	0	266
76	Dwelling	568651	590617	76-1	-8	0	18	2	1.1	0	271
				76-2	0	9	16	2	1.1	0	1
				76-3	8	0	18	2	1.1	0	91
				76-4	0	-9	16	2	1.1	0	181
77	Dwelling	568658	590509	77-1	-8	5	17	2	1.1	0	300
				77-2	4	7	18	2	1.1	0	30
				77-3	8	-5	17	2	1.1	0	120
				77-4	-4	-7	18	2	1.1	0	210
78	Dwelling	568843	590820	78-1	-5	4	6	2	1.1	0	307
				78-2	2	2	12	2	1.1	0	37
				78-3	5	-4	6	2	1.1	0	127
				78-4	-2	-2	12	2	1.1	0	217
79	Dwelling	568946	590887	79-1	-7	4	16	2	1.1	0	302
				79-2	4	7	16	2	1.1	0	32
				79-3	7	-4	16	2	1.1	0	122
				79-4	-4	-7	16	2	1.1	0	212
80	Dwelling	568965	591409	80-1	-4	5	21	2	1.1	0	321
				80-2	8	7	13	2	1.1	0	51
				80-3	4	-5	21	2	1.1	0	141
				80-4	-8	-7	13	2	1.1	0	231

Shadow Flicker Model Input Data

Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
81	Dwelling	569002	590833	81-1	-5	2	6	2	1.1	0	293
				81-2	1	3	10	2	1.1	0	23
				81-3	5	-2	6	2	1.1	0	113
				81-4	-1	-3	10	2	1.1	0	203
82	Dwelling	569046	590783	82-1	0	10	14	2	1.1	0	358
				82-2	7	0	20	2	1.1	0	88
				82-3	0	-10	14	2	1.1	0	178
				82-4	-7	0	20	2	1.1	0	268
83	Dwelling	569082	593126	83-1	-9	4	8	2	1.1	0	291
				83-2	1	4	20	2	1.1	0	21
				83-3	9	-4	8	2	1.1	0	111
				83-4	-1	-4	20	2	1.1	0	201
84	Dwelling	569504	593047	84-1	-2	8	10	2	1.1	0	348
				84-2	5	1	17	2	1.1	0	78
				84-3	2	-8	10	2	1.1	0	168
				84-4	-5	-1	17	2	1.1	0	258
85	Dwelling	569930	593119	85-1	-2	3	17	2	1.1	0	328
				85-2	7	5	6	2	1.1	0	58
				85-3	2	-3	17	2	1.1	0	148
				85-4	-7	-5	6	2	1.1	0	238
86	Dwelling	562810	588431	86-1	0	5	6	2	1.1	0	356
				86-2	3	0	11	2	1.1	0	86
				86-3	0	-5	6	2	1.1	0	176
				86-4	-3	0	11	2	1.1	0	266
87	Dwelling	562483	588588	87-1	-1	7	10	2	1.1	0	355
				87-2	5	0	14	2	1.1	0	85
				87-3	1	-7	10	2	1.1	0	175
				87-4	-5	0	14	2	1.1	0	265
88	Dwelling	561529	590780	88-1	-5	7	17	2	1.1	0	326
				88-2	7	5	18	2	1.1	0	56
				88-3	5	-7	17	2	1.1	0	146
				88-4	-7	-5	18	2	1.1	0	236
89	Dwelling	562132	591406	89-1	2	3	12	2	1.1	0	30
				89-2	5	-3	7	2	1.1	0	120
				89-3	-2	-3	12	2	1.1	0	210
				89-4	-5	3	7	2	1.1	0	300
90	Dwelling	561396	590661	90-1	-4	2	24	2	1.1	0	296
				90-2	5	11	10	2	1.1	0	26
				90-3	4	-2	24	2	1.1	0	116
				90-4	-5	-11	10	2	1.1	0	206

Shadow Flicker Model Input Data

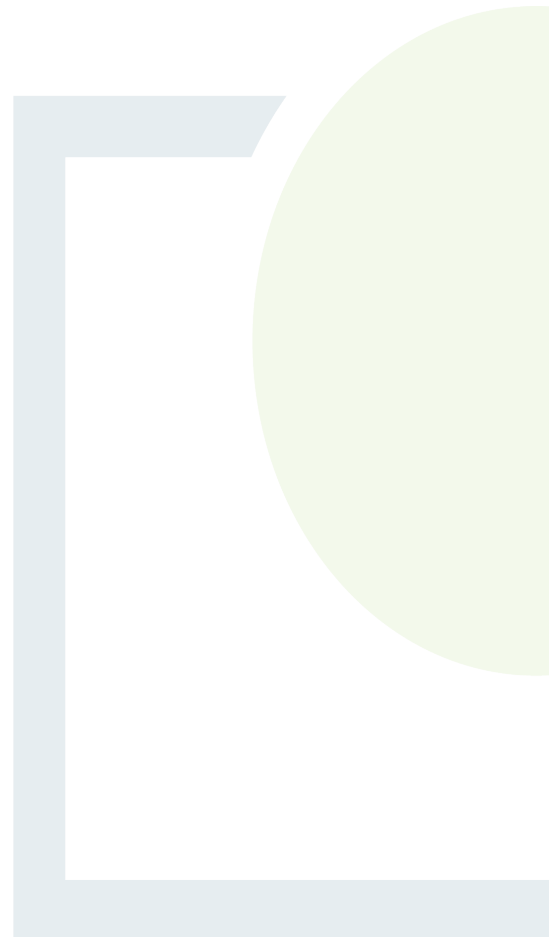
Receptor ID	Receptor Type	X Coordinate (IRENET 95)	Y Coordinate (IRENET 95)	Façade ID	Façade Centre - Offset From X Coordinate (m)	Façade Centre - Offset From Y Coordinate (m)	Façade Width (m)	Façade Height (m)	Façade Centre Height Above Ground (m)	Façade Tilt From Vertical (°)	Façade Orientation From North (°)
91	Dwelling	561849	590666	91-1	3	4	10	2	1.1	0	30
				91-2	4	-3	10	2	1.1	0	120
				91-3	-3	-4	10	2	1.1	0	210
				91-4	-4	3	10	2	1.1	0	300
92	Dwelling	567522	591281	92-1	-3	1	12	2	1.1	0	288
				92-2	2	6	7	2	1.1	0	18
				92-3	3	-1	12	2	1.1	0	108
				92-4	-2	-6	7	2	1.1	0	198
93	Dwelling	568497	590349	93-1	-3	2	9	2	1.1	0	308
				93-2	3	4	7	2	1.1	0	38
				93-3	3	-2	9	2	1.1	0	128
				93-4	-3	-4	7	2	1.1	0	218
94	Dwelling	563438	588222	94-1	-6	1	22	2	1.1	0	278
				94-2	2	11	12	2	1.1	0	8
				94-3	6	-1	22	2	1.1	0	98
				94-4	-2	-11	12	2	1.1	0	188
95	Dwelling	564263	588417	95-1	-7	1	10	2	1.1	0	281
				95-2	1	5	14	2	1.1	0	11
				95-3	7	-1	10	2	1.1	0	101
				95-4	-1	-5	14	2	1.1	0	191



CONSULTANTS IN
ENGINEERING,
ENVIRONMENTAL SCIENCE &
PLANNING

Appendix 12.2

Detailed Shadow Flicker
Listing



Shadow Flicker Mitigation: Total Calculated Potential Shadow Times per Turbine

All times are in UTC

Turbine 2

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	10:55	11:10
01-Jan	08:42	16:32	11:13	11:40
01-Jan	08:42	16:32	11:49	12:17
01-Jan	08:42	16:32	12:56	13:07
02-Jan	08:42	16:33	10:57	11:10
02-Jan	08:42	16:33	11:15	11:39
02-Jan	08:42	16:33	11:53	12:17
02-Jan	08:42	16:33	13:00	13:05
03-Jan	08:42	16:34	10:59	11:10
03-Jan	08:42	16:34	11:18	11:39
03-Jan	08:42	16:34	11:54	12:17
04-Jan	08:41	16:35	11:01	11:09
04-Jan	08:41	16:35	11:21	11:39
04-Jan	08:41	16:35	11:55	12:16
05-Jan	08:41	16:36	11:23	11:38
05-Jan	08:41	16:36	11:57	12:16
06-Jan	08:41	16:38	11:25	11:37
06-Jan	08:41	16:38	11:58	12:15
07-Jan	08:40	16:39	11:27	11:36
07-Jan	08:40	16:39	12:00	12:14
08-Jan	08:40	16:40	12:03	12:10
17-Feb	07:46	17:50	08:32	08:45
17-Feb	07:46	17:50	09:01	09:09
18-Feb	07:44	17:52	08:30	08:48
18-Feb	07:44	17:52	08:53	09:11
19-Feb	07:42	17:54	08:28	09:12
20-Feb	07:40	17:55	08:25	09:13
21-Feb	07:38	17:57	08:24	09:14
22-Feb	07:36	17:59	08:22	09:15
23-Feb	07:33	18:01	08:21	09:16
24-Feb	07:31	18:03	08:21	09:16
25-Feb	07:29	18:05	08:20	09:17
26-Feb	07:27	18:07	08:19	09:17
27-Feb	07:25	18:08	08:08	08:14
27-Feb	07:25	18:08	08:19	09:17
28-Feb	07:23	18:10	08:04	08:18
28-Feb	07:23	18:10	08:19	09:17
29-Feb	07:21	18:12	08:01	09:17
01-Mar	07:18	18:14	07:59	09:16
02-Mar	07:16	18:16	07:57	09:16
03-Mar	07:14	18:17	07:55	09:15
04-Mar	07:12	18:19	07:54	09:15
05-Mar	07:10	18:21	07:53	09:14
06-Mar	07:07	18:23	07:52	08:24
06-Mar	07:07	18:23	08:23	09:13
07-Mar	07:05	18:25	07:52	08:24
07-Mar	07:05	18:25	08:26	09:11
08-Mar	07:03	18:26	07:51	08:23
08-Mar	07:03	18:26	08:35	09:10
09-Mar	07:00	18:28	07:51	08:23
09-Mar	07:00	18:28	08:36	09:08
10-Mar	06:58	18:30	07:51	08:22
10-Mar	06:58	18:30	08:37	09:06
11-Mar	06:56	18:32	07:51	08:21
11-Mar	06:56	18:32	08:38	09:04

12-Mar	06:54	18:33	07:52	08:20
12-Mar	06:54	18:33	08:40	09:02
13-Mar	06:51	18:35	07:52	08:18
13-Mar	06:51	18:35	08:43	08:59
14-Mar	06:49	18:37	07:53	08:16
15-Mar	06:47	18:39	07:55	08:12
16-Mar	06:44	18:40	07:57	08:10
23-Apr	05:19	19:46	19:05	19:16
24-Apr	05:17	19:47	19:02	19:19
25-Apr	05:15	19:49	18:59	19:21
26-Apr	05:13	19:51	18:57	19:23
27-Apr	05:11	19:53	18:56	19:24
28-Apr	05:09	19:54	18:55	19:26
29-Apr	05:07	19:56	18:54	19:27
30-Apr	05:05	19:58	18:53	19:29
01-May	05:03	19:59	18:52	19:30
02-May	05:01	20:01	18:51	19:31
03-May	04:59	20:03	18:51	19:32
04-May	04:57	20:04	18:50	19:33
05-May	04:55	20:06	18:50	19:33
06-May	04:54	20:08	18:50	19:34
07-May	04:52	20:09	18:50	19:34
08-May	04:50	20:11	18:50	19:34
09-May	04:48	20:12	18:50	19:35
10-May	04:47	20:14	18:50	19:35
11-May	04:45	20:16	18:50	19:35
12-May	04:43	20:17	18:50	19:35
13-May	04:42	20:19	18:50	19:35
14-May	04:40	20:20	18:51	19:35
15-May	04:39	20:22	18:51	19:35
16-May	04:37	20:23	18:52	19:35
17-May	04:36	20:25	18:52	19:35
18-May	04:34	20:26	18:53	19:34
19-May	04:33	20:28	18:54	19:34
20-May	04:32	20:29	18:54	19:34
21-May	04:30	20:31	18:55	19:34
22-May	04:29	20:32	18:55	19:33
23-May	04:28	20:34	18:56	19:33
24-May	04:27	20:35	18:57	19:33
25-May	04:25	20:36	18:57	19:32
26-May	04:24	20:38	05:11	05:12
26-May	04:24	20:38	18:58	19:32
27-May	04:23	20:39	05:10	05:14
27-May	04:23	20:39	18:59	19:31
28-May	04:22	20:40	05:10	05:16
28-May	04:22	20:40	19:00	19:31
29-May	04:21	20:41	05:08	05:18
29-May	04:21	20:41	19:01	19:30
30-May	04:20	20:42	05:07	05:19
30-May	04:20	20:42	19:02	19:30
31-May	04:20	20:44	05:07	05:21
31-May	04:20	20:44	19:04	19:29
01-Jun	04:19	20:45	05:07	05:22
01-Jun	04:19	20:45	19:05	19:29
02-Jun	04:18	20:46	05:07	05:24
02-Jun	04:18	20:46	19:06	19:28
03-Jun	04:17	20:47	05:07	05:25
03-Jun	04:17	20:47	19:07	19:27
04-Jun	04:16	20:48	05:06	05:27

04-Jun	04:16	20:48	19:08	19:27
05-Jun	04:16	20:49	05:06	05:28
05-Jun	04:16	20:49	19:09	19:26
06-Jun	04:15	20:50	05:06	05:29
06-Jun	04:15	20:50	19:10	19:25
07-Jun	04:15	20:50	05:06	05:30
07-Jun	04:15	20:50	19:11	19:24
08-Jun	04:14	20:51	05:06	05:31
08-Jun	04:14	20:51	19:13	19:23
09-Jun	04:14	20:52	05:07	05:32
09-Jun	04:14	20:52	19:15	19:21
10-Jun	04:13	20:53	05:07	05:33
11-Jun	04:13	20:54	05:07	05:34
12-Jun	04:13	20:54	05:07	05:35
13-Jun	04:13	20:55	05:07	05:35
14-Jun	04:13	20:55	05:07	05:36
15-Jun	04:12	20:56	05:07	05:37
16-Jun	04:12	20:56	05:08	05:37
17-Jun	04:12	20:57	05:08	05:38
18-Jun	04:12	20:57	05:08	05:38
19-Jun	04:13	20:57	05:08	05:38
20-Jun	04:13	20:58	05:08	05:39
21-Jun	04:13	20:58	05:09	05:39
22-Jun	04:13	20:58	05:09	05:39
23-Jun	04:13	20:58	05:09	05:39
24-Jun	04:14	20:58	05:09	05:39
25-Jun	04:14	20:58	05:09	05:39
26-Jun	04:15	20:58	05:10	05:39
27-Jun	04:15	20:58	05:10	05:39
28-Jun	04:16	20:58	05:10	05:39
29-Jun	04:16	20:57	05:10	05:39
30-Jun	04:17	20:57	05:11	05:38
01-Jul	04:18	20:57	05:11	05:38
01-Jul	04:18	20:57	19:20	19:25
02-Jul	04:18	20:56	05:11	05:37
02-Jul	04:18	20:56	19:18	19:28
03-Jul	04:19	20:56	05:12	05:37
03-Jul	04:19	20:56	19:17	19:29
04-Jul	04:20	20:55	05:12	05:36
04-Jul	04:20	20:55	19:16	19:31
05-Jul	04:21	20:55	05:12	05:35
05-Jul	04:21	20:55	19:15	19:32
06-Jul	04:22	20:54	05:13	05:35
06-Jul	04:22	20:54	19:15	19:33
07-Jul	04:23	20:54	05:13	05:34
07-Jul	04:23	20:54	19:14	19:34
08-Jul	04:24	20:53	05:13	05:33
08-Jul	04:24	20:53	19:13	19:35
09-Jul	04:25	20:52	05:14	05:32
09-Jul	04:25	20:52	19:13	19:36
10-Jul	04:26	20:51	05:14	05:31
10-Jul	04:26	20:51	19:12	19:37
11-Jul	04:27	20:50	05:15	05:29
11-Jul	04:27	20:50	19:11	19:38
12-Jul	04:28	20:50	05:15	05:28
12-Jul	04:28	20:50	19:10	19:38
13-Jul	04:29	20:49	05:16	05:27
13-Jul	04:29	20:49	19:09	19:39
14-Jul	04:30	20:48	05:18	05:25

14-Jul	04:30	20:48	19:08	19:40
15-Jul	04:32	20:47	05:19	05:23
15-Jul	04:32	20:47	19:07	19:40
16-Jul	04:33	20:46	05:19	05:22
16-Jul	04:33	20:46	19:07	19:41
17-Jul	04:34	20:44	19:06	19:42
18-Jul	04:35	20:43	19:06	19:42
19-Jul	04:37	20:42	19:05	19:43
20-Jul	04:38	20:41	19:05	19:43
21-Jul	04:39	20:40	19:04	19:44
22-Jul	04:41	20:38	19:04	19:44
23-Jul	04:42	20:37	19:03	19:44
24-Jul	04:44	20:35	19:03	19:45
25-Jul	04:45	20:34	19:02	19:45
26-Jul	04:46	20:32	19:02	19:45
27-Jul	04:48	20:31	19:01	19:45
28-Jul	04:49	20:29	19:01	19:45
29-Jul	04:51	20:28	19:00	19:45
30-Jul	04:52	20:26	19:00	19:45
31-Jul	04:54	20:25	19:00	19:45
01-Aug	04:56	20:23	19:00	19:45
02-Aug	04:57	20:21	18:59	19:44
03-Aug	04:59	20:19	18:59	19:44
04-Aug	05:00	20:18	18:59	19:43
05-Aug	05:02	20:16	18:59	19:43
06-Aug	05:03	20:14	18:59	19:42
07-Aug	05:05	20:12	19:00	19:41
08-Aug	05:07	20:10	19:00	19:40
09-Aug	05:08	20:08	19:00	19:39
10-Aug	05:10	20:07	19:00	19:38
11-Aug	05:11	20:05	19:01	19:36
12-Aug	05:13	20:03	19:02	19:34
13-Aug	05:15	20:01	19:02	19:32
14-Aug	05:16	19:59	19:03	19:30
15-Aug	05:18	19:57	19:05	19:29
16-Aug	05:20	19:55	19:06	19:27
17-Aug	05:21	19:52	19:08	19:24
18-Aug	05:23	19:50	19:13	19:19
26-Sep	06:27	18:22	07:40	07:52
27-Sep	06:28	18:19	07:37	07:54
28-Sep	06:30	18:17	07:35	07:57
29-Sep	06:32	18:15	07:33	07:58
29-Sep	06:32	18:15	08:24	08:39
30-Sep	06:33	18:12	07:32	08:00
30-Sep	06:33	18:12	08:20	08:42
01-Oct	06:35	18:10	07:31	08:00
01-Oct	06:35	18:10	08:18	08:44
02-Oct	06:37	18:08	07:30	08:01
02-Oct	06:37	18:08	08:16	08:45
03-Oct	06:38	18:05	07:30	08:01
03-Oct	06:38	18:05	08:14	08:46
04-Oct	06:40	18:03	07:29	08:01
04-Oct	06:40	18:03	08:13	08:47
05-Oct	06:42	18:01	07:29	08:01
05-Oct	06:42	18:01	08:04	08:49
06-Oct	06:43	17:58	07:29	08:01
06-Oct	06:43	17:58	08:01	08:49
07-Oct	06:45	17:56	07:29	08:50
08-Oct	06:47	17:54	07:30	08:50

09-Oct	06:49	17:52	07:30	08:51
10-Oct	06:50	17:49	07:31	08:51
11-Oct	06:52	17:47	07:33	08:51
12-Oct	06:54	17:45	07:35	08:51
13-Oct	06:55	17:43	07:36	07:53
13-Oct	06:55	17:43	07:53	08:50
14-Oct	06:57	17:41	07:39	07:50
14-Oct	06:57	17:41	07:52	08:50
15-Oct	06:59	17:38	07:52	08:50
16-Oct	07:01	17:36	07:52	08:49
17-Oct	07:02	17:34	07:52	08:49
18-Oct	07:04	17:32	07:53	08:48
19-Oct	07:06	17:30	07:53	08:47
20-Oct	07:08	17:28	07:54	08:46
21-Oct	07:09	17:26	07:55	08:45
22-Oct	07:11	17:24	07:57	08:43
23-Oct	07:13	17:22	07:59	08:19
23-Oct	07:13	17:22	08:19	08:42
24-Oct	07:15	17:19	08:01	08:17
24-Oct	07:15	17:19	08:27	08:40
25-Oct	07:17	17:17	08:04	08:13
25-Oct	07:17	17:17	08:35	08:37
04-Dec	08:24	16:23	11:14	11:18
04-Dec	08:24	16:23	11:46	11:56
05-Dec	08:25	16:23	11:11	11:21
05-Dec	08:25	16:23	11:44	11:59
06-Dec	08:27	16:22	11:10	11:23
06-Dec	08:27	16:22	11:43	12:01
07-Dec	08:28	16:22	10:50	10:54
07-Dec	08:28	16:22	11:09	11:25
07-Dec	08:28	16:22	11:43	12:03
08-Dec	08:29	16:22	10:48	10:56
08-Dec	08:29	16:22	11:08	11:26
08-Dec	08:29	16:22	11:42	12:04
09-Dec	08:30	16:22	10:46	10:58
09-Dec	08:30	16:22	11:05	11:28
09-Dec	08:30	16:22	11:42	12:05
10-Dec	08:31	16:22	10:46	11:00
10-Dec	08:31	16:22	11:03	11:29
10-Dec	08:31	16:22	11:42	12:06
10-Dec	08:31	16:22	12:47	12:55
11-Dec	08:32	16:21	10:45	11:01
11-Dec	08:32	16:21	11:02	11:30
11-Dec	08:32	16:21	11:38	12:07
11-Dec	08:32	16:21	12:45	12:58
12-Dec	08:33	16:21	10:45	11:02
12-Dec	08:33	16:21	11:02	11:31
12-Dec	08:33	16:21	11:37	12:08
12-Dec	08:33	16:21	12:44	12:59
13-Dec	08:34	16:21	10:45	11:32
13-Dec	08:34	16:21	11:36	12:09
13-Dec	08:34	16:21	12:43	13:00
14-Dec	08:35	16:21	10:45	11:33
14-Dec	08:35	16:21	11:36	12:10
14-Dec	08:35	16:21	12:43	13:02
15-Dec	08:36	16:22	10:45	11:34
15-Dec	08:36	16:22	11:35	12:11
15-Dec	08:36	16:22	12:43	13:03
16-Dec	08:37	16:22	10:45	11:34

16-Dec	08:37	16:22	11:35	12:12
16-Dec	08:37	16:22	12:43	13:03
17-Dec	08:37	16:22	10:46	11:35
17-Dec	08:37	16:22	11:35	12:12
17-Dec	08:37	16:22	12:43	13:04
18-Dec	08:38	16:22	10:46	11:36
18-Dec	08:38	16:22	11:35	12:13
18-Dec	08:38	16:22	12:43	13:05
19-Dec	08:39	16:23	10:46	11:36
19-Dec	08:39	16:23	11:35	12:13
19-Dec	08:39	16:23	12:44	13:06
20-Dec	08:39	16:23	10:47	12:14
20-Dec	08:39	16:23	12:44	13:06
21-Dec	08:40	16:24	10:47	12:14
21-Dec	08:40	16:24	12:44	13:07
22-Dec	08:40	16:24	10:48	11:38
22-Dec	08:40	16:24	11:37	12:15
22-Dec	08:40	16:24	12:45	13:07
23-Dec	08:41	16:25	10:48	11:38
23-Dec	08:41	16:25	11:37	12:15
23-Dec	08:41	16:25	12:46	13:08
24-Dec	08:41	16:25	10:49	11:39
24-Dec	08:41	16:25	11:38	12:16
24-Dec	08:41	16:25	12:46	13:08
25-Dec	08:41	16:26	10:50	11:39
25-Dec	08:41	16:26	11:39	12:16
25-Dec	08:41	16:26	12:47	13:08
26-Dec	08:42	16:27	10:50	11:39
26-Dec	08:42	16:27	11:40	12:16
26-Dec	08:42	16:27	12:48	13:08
27-Dec	08:42	16:28	10:51	11:39
27-Dec	08:42	16:28	11:41	12:17
27-Dec	08:42	16:28	12:49	13:08
28-Dec	08:42	16:29	10:52	11:40
28-Dec	08:42	16:29	11:43	12:17
28-Dec	08:42	16:29	12:50	13:08
29-Dec	08:42	16:29	10:53	11:40
29-Dec	08:42	16:29	11:44	12:17
29-Dec	08:42	16:29	12:51	13:08
30-Dec	08:42	16:30	10:54	11:11
30-Dec	08:42	16:30	11:11	11:40
30-Dec	08:42	16:30	11:46	12:17
30-Dec	08:42	16:30	12:53	13:08
31-Dec	08:42	16:31	10:55	11:10
31-Dec	08:42	16:31	11:12	11:40
31-Dec	08:42	16:31	11:48	12:17
31-Dec	08:42	16:31	12:55	13:07

Turbine 3

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	13:49	15:07
02-Jan	08:42	16:33	13:50	15:08
03-Jan	08:42	16:34	13:50	15:08
04-Jan	08:41	16:35	13:51	15:08
05-Jan	08:41	16:36	13:52	15:09
06-Jan	08:41	16:38	13:52	15:09
07-Jan	08:40	16:39	13:53	15:10
08-Jan	08:40	16:40	13:54	15:10
09-Jan	08:39	16:42	13:54	15:10

10-Jan	08:39	16:43	13:55	15:10
11-Jan	08:38	16:44	13:55	15:11
12-Jan	08:38	16:46	13:56	15:11
13-Jan	08:37	16:47	13:57	15:11
14-Jan	08:36	16:49	13:58	15:11
15-Jan	08:35	16:50	13:58	15:11
16-Jan	08:34	16:52	13:59	15:11
17-Jan	08:33	16:54	14:00	15:11
18-Jan	08:33	16:55	14:01	15:11
19-Jan	08:32	16:57	14:02	15:11
20-Jan	08:30	16:59	14:03	15:11
21-Jan	08:29	17:00	14:04	15:11
22-Jan	08:28	17:02	14:05	15:10
23-Jan	08:27	17:04	14:06	15:10
24-Jan	08:26	17:06	14:07	15:10
25-Jan	08:24	17:07	14:09	15:09
26-Jan	08:23	17:09	14:10	15:08
27-Jan	08:22	17:11	14:12	15:08
28-Jan	08:20	17:13	14:13	15:11
29-Jan	08:19	17:15	14:15	15:10
30-Jan	08:17	17:16	14:18	15:09
31-Jan	08:16	17:18	14:19	15:08
01-Feb	08:14	17:20	14:21	15:06
02-Feb	08:13	17:22	14:23	15:04
03-Feb	08:11	17:24	14:25	15:02
04-Feb	08:10	17:26	14:27	15:00
05-Feb	08:08	17:27	14:30	14:56
06-Feb	08:06	17:29	14:35	14:47
04-Nov	07:35	16:59	14:06	14:16
05-Nov	07:36	16:57	14:01	14:25
06-Nov	07:38	16:55	13:57	14:29
07-Nov	07:40	16:54	13:55	14:32
08-Nov	07:42	16:52	13:53	14:34
09-Nov	07:44	16:50	13:51	14:36
10-Nov	07:45	16:49	13:50	14:38
11-Nov	07:47	16:47	13:49	14:39
12-Nov	07:49	16:46	13:47	14:41
13-Nov	07:51	16:44	13:45	14:42
14-Nov	07:52	16:43	13:44	14:43
15-Nov	07:54	16:41	13:43	14:41
16-Nov	07:56	16:40	13:42	14:42
17-Nov	07:58	16:39	13:41	14:42
18-Nov	07:59	16:37	13:40	14:43
19-Nov	08:01	16:36	13:39	14:44
20-Nov	08:03	16:35	13:39	14:45
21-Nov	08:04	16:34	13:38	14:46
22-Nov	08:06	16:33	13:38	14:47
23-Nov	08:08	16:32	13:37	14:47
24-Nov	08:09	16:31	13:37	14:48
25-Nov	08:11	16:30	13:37	14:49
26-Nov	08:13	16:29	13:37	14:49
27-Nov	08:14	16:28	13:37	14:50
28-Nov	08:16	16:27	13:37	14:50
29-Nov	08:17	16:26	13:37	14:51
30-Nov	08:18	16:26	13:37	14:52
01-Dec	08:20	16:25	13:37	14:52
02-Dec	08:21	16:24	13:37	14:53
03-Dec	08:23	16:24	13:37	14:53
04-Dec	08:24	16:23	13:37	14:54

05-Dec	08:25	16:23	13:38	14:54
06-Dec	08:27	16:22	13:38	14:55
07-Dec	08:28	16:22	13:38	14:55
08-Dec	08:29	16:22	13:38	14:56
09-Dec	08:30	16:22	13:39	14:56
10-Dec	08:31	16:22	13:39	14:57
11-Dec	08:32	16:21	13:39	14:57
12-Dec	08:33	16:21	13:40	14:58
13-Dec	08:34	16:21	13:40	14:58
14-Dec	08:35	16:21	13:41	14:59
15-Dec	08:36	16:22	13:41	14:59
16-Dec	08:37	16:22	13:42	15:00
17-Dec	08:37	16:22	13:42	15:00
18-Dec	08:38	16:22	13:42	15:01
19-Dec	08:39	16:23	13:43	15:01
20-Dec	08:39	16:23	13:43	15:02
21-Dec	08:40	16:24	13:44	15:02
22-Dec	08:40	16:24	13:44	15:03
23-Dec	08:41	16:25	13:45	15:03
24-Dec	08:41	16:25	13:45	15:04
25-Dec	08:41	16:26	13:46	15:04
26-Dec	08:42	16:27	13:46	15:05
27-Dec	08:42	16:28	13:47	15:05
28-Dec	08:42	16:29	13:48	15:06
29-Dec	08:42	16:29	13:48	15:06
30-Dec	08:42	16:30	13:49	15:07
31-Dec	08:42	16:31	13:49	15:07

Turbine 4

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
20-Feb	07:40	17:55	08:50	08:54
21-Feb	07:38	17:57	08:41	08:53
22-Feb	07:36	17:59	08:35	08:52
23-Feb	07:33	18:01	08:36	08:50
24-Feb	07:31	18:03	08:40	08:46
24-Mar	06:26	18:54	18:02	18:21
25-Mar	06:24	18:56	17:57	18:26
26-Mar	06:21	18:58	17:53	18:29
27-Mar	06:19	18:59	17:51	18:31
28-Mar	06:17	19:01	17:48	18:33
29-Mar	06:14	19:03	17:46	18:35
30-Mar	06:12	19:05	17:44	18:36
31-Mar	06:10	19:06	17:42	18:37
01-Apr	06:07	19:08	17:40	18:38
02-Apr	06:05	19:10	17:39	18:40
03-Apr	06:03	19:11	17:37	18:41
04-Apr	06:00	19:13	17:36	18:43
05-Apr	05:58	19:15	17:35	18:45
06-Apr	05:56	19:17	17:34	18:47
07-Apr	05:54	19:18	17:33	18:48
08-Apr	05:51	19:20	17:32	18:49
09-Apr	05:49	19:22	17:31	18:50
10-Apr	05:47	19:23	17:30	18:51
11-Apr	05:45	19:25	17:30	18:52
12-Apr	05:42	19:27	17:29	18:53
13-Apr	05:40	19:29	17:29	18:53
14-Apr	05:38	19:30	17:28	18:54
15-Apr	05:36	19:32	17:28	18:54
16-Apr	05:34	19:34	17:27	18:55

17-Apr	05:31	19:35	17:27	18:55
18-Apr	05:29	19:37	17:27	18:55
19-Apr	05:27	19:39	17:27	18:56
20-Apr	05:25	19:41	17:26	18:56
21-Apr	05:23	19:42	17:26	18:56
22-Apr	05:21	19:44	17:26	18:56
23-Apr	05:19	19:46	17:26	18:56
24-Apr	05:17	19:47	17:26	18:56
25-Apr	05:15	19:49	17:26	18:56
26-Apr	05:13	19:51	17:26	18:56
27-Apr	05:11	19:53	17:26	18:56
28-Apr	05:09	19:54	17:26	18:55
29-Apr	05:07	19:56	17:26	18:51
30-Apr	05:05	19:58	17:26	18:51
01-May	05:03	19:59	17:27	18:51
02-May	05:01	20:01	17:27	18:50
03-May	04:59	20:03	17:27	18:50
04-May	04:57	20:04	17:28	18:50
05-May	04:55	20:06	17:28	18:49
06-May	04:54	20:08	17:28	18:49
07-May	04:52	20:09	17:29	18:48
08-May	04:50	20:11	17:30	18:48
09-May	04:48	20:12	17:30	18:47
10-May	04:47	20:14	17:31	18:47
11-May	04:45	20:16	17:32	18:46
12-May	04:43	20:17	17:32	18:46
13-May	04:42	20:19	17:33	18:45
14-May	04:40	20:20	17:34	18:45
15-May	04:39	20:22	17:35	18:44
16-May	04:37	20:23	17:36	18:43
17-May	04:36	20:25	17:37	18:43
18-May	04:34	20:26	17:38	18:42
19-May	04:33	20:28	17:39	18:41
20-May	04:32	20:29	17:41	18:41
21-May	04:30	20:31	17:42	18:40
22-May	04:29	20:32	17:43	18:39
23-May	04:28	20:34	17:45	18:38
24-May	04:27	20:35	17:47	18:38
25-May	04:25	20:36	17:48	18:37
26-May	04:24	20:38	17:50	18:36
27-May	04:23	20:39	17:51	18:35
28-May	04:22	20:40	17:52	18:34
29-May	04:21	20:41	17:53	18:34
30-May	04:20	20:42	17:54	18:33
31-May	04:20	20:44	17:55	18:32
01-Jun	04:19	20:45	17:56	18:31
02-Jun	04:18	20:46	17:57	18:30
03-Jun	04:17	20:47	17:59	18:29
04-Jun	04:16	20:48	18:00	18:31
05-Jun	04:16	20:49	18:01	18:30
06-Jun	04:15	20:50	18:02	18:31
07-Jun	04:15	20:50	18:04	18:30
08-Jun	04:14	20:51	18:05	18:29
09-Jun	04:14	20:52	18:06	18:27
10-Jun	04:13	20:53	18:08	18:26
11-Jun	04:13	20:54	18:09	18:25
12-Jun	04:13	20:54	18:11	18:24
13-Jun	04:13	20:55	18:13	18:22
14-Jun	04:13	20:55	18:17	18:19

27-Jun	04:15	20:58	18:17	18:25
28-Jun	04:16	20:58	18:15	18:27
29-Jun	04:16	20:57	18:14	18:29
30-Jun	04:17	20:57	18:13	18:30
01-Jul	04:18	20:57	18:11	18:32
02-Jul	04:18	20:56	18:10	18:33
03-Jul	04:19	20:56	18:09	18:35
04-Jul	04:20	20:55	18:08	18:36
05-Jul	04:21	20:55	18:08	18:36
06-Jul	04:22	20:54	18:07	18:37
07-Jul	04:23	20:54	18:06	18:36
08-Jul	04:24	20:53	18:05	18:37
09-Jul	04:25	20:52	18:04	18:38
10-Jul	04:26	20:51	18:03	18:39
11-Jul	04:27	20:50	18:02	18:40
12-Jul	04:28	20:50	18:02	18:42
13-Jul	04:29	20:49	18:01	18:43
14-Jul	04:30	20:48	18:00	18:44
15-Jul	04:32	20:47	17:59	18:45
16-Jul	04:33	20:46	17:58	18:46
17-Jul	04:34	20:44	17:57	18:47
18-Jul	04:35	20:43	17:55	18:48
19-Jul	04:37	20:42	17:54	18:48
20-Jul	04:38	20:41	17:52	18:49
21-Jul	04:39	20:40	17:51	18:50
22-Jul	04:41	20:38	17:50	18:51
23-Jul	04:42	20:37	17:49	18:52
24-Jul	04:44	20:35	17:48	18:52
25-Jul	04:45	20:34	17:47	18:53
26-Jul	04:46	20:32	17:46	18:54
27-Jul	04:48	20:31	17:45	18:55
28-Jul	04:49	20:29	17:44	18:55
29-Jul	04:51	20:28	17:43	18:56
30-Jul	04:52	20:26	17:42	18:56
31-Jul	04:54	20:25	17:41	18:57
01-Aug	04:56	20:23	17:40	18:57
02-Aug	04:57	20:21	17:40	18:58
03-Aug	04:59	20:19	17:39	18:58
04-Aug	05:00	20:18	17:38	18:58
05-Aug	05:02	20:16	17:38	18:58
06-Aug	05:03	20:14	17:37	18:59
07-Aug	05:05	20:12	17:36	18:59
08-Aug	05:07	20:10	17:36	18:59
09-Aug	05:08	20:08	17:35	18:59
10-Aug	05:10	20:07	17:35	18:59
11-Aug	05:11	20:05	17:34	18:59
12-Aug	05:13	20:03	17:34	18:59
13-Aug	05:15	20:01	17:33	19:03
14-Aug	05:16	19:59	17:33	19:03
15-Aug	05:18	19:57	17:32	19:02
16-Aug	05:20	19:55	17:32	19:02
17-Aug	05:21	19:52	17:32	19:02
18-Aug	05:23	19:50	17:31	19:01
19-Aug	05:24	19:48	17:31	19:01
20-Aug	05:26	19:46	17:31	19:00
21-Aug	05:28	19:44	17:31	19:00
22-Aug	05:29	19:42	17:30	18:59
23-Aug	05:31	19:40	17:30	18:58
24-Aug	05:33	19:38	17:30	18:58

25-Aug	05:34	19:35	17:30	18:57
26-Aug	05:36	19:33	17:29	18:56
27-Aug	05:38	19:31	17:29	18:55
28-Aug	05:39	19:29	17:29	18:54
29-Aug	05:41	19:27	17:29	18:53
30-Aug	05:42	19:24	17:29	18:51
31-Aug	05:44	19:22	17:29	18:50
01-Sep	05:46	19:20	17:30	18:49
02-Sep	05:47	19:17	17:30	18:47
03-Sep	05:49	19:15	17:30	18:45
04-Sep	05:51	19:13	17:30	18:43
05-Sep	05:52	19:11	17:31	18:41
06-Sep	05:54	19:08	17:31	18:39
07-Sep	05:55	19:06	17:32	18:36
08-Sep	05:57	19:04	17:33	18:34
09-Sep	05:59	19:01	17:34	18:32
10-Sep	06:00	18:59	17:35	18:30
11-Sep	06:02	18:57	17:36	18:28
12-Sep	06:04	18:54	17:37	18:26
13-Sep	06:05	18:52	17:39	18:24
14-Sep	06:07	18:50	17:40	18:21
15-Sep	06:09	18:47	17:43	18:18
16-Sep	06:10	18:45	17:45	18:15
17-Sep	06:12	18:43	17:49	18:10
18-Oct	07:04	17:32	08:09	08:21
19-Oct	07:06	17:30	08:06	08:23
20-Oct	07:08	17:28	08:09	08:24
21-Oct	07:09	17:26	08:17	08:25

Turbine 5

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
11-Feb	07:57	17:39	08:28	08:41
12-Feb	07:55	17:41	08:23	08:46
13-Feb	07:54	17:42	08:20	08:49
14-Feb	07:52	17:44	08:17	08:51
15-Feb	07:50	17:46	08:15	08:53
16-Feb	07:48	17:48	08:14	08:55
17-Feb	07:46	17:50	08:12	08:57
18-Feb	07:44	17:52	08:10	08:58
19-Feb	07:42	17:54	08:08	08:59
20-Feb	07:40	17:55	08:05	09:00
21-Feb	07:38	17:57	08:03	09:01
22-Feb	07:36	17:59	08:01	09:02
23-Feb	07:33	18:01	07:59	09:02
24-Feb	07:31	18:03	07:58	09:03
25-Feb	07:29	18:05	07:56	09:03
26-Feb	07:27	18:07	07:55	09:04
27-Feb	07:25	18:08	07:54	09:04
28-Feb	07:23	18:10	07:53	09:04
29-Feb	07:21	18:12	07:52	09:04
01-Mar	07:18	18:14	07:51	09:04
02-Mar	07:16	18:16	07:50	09:04
03-Mar	07:14	18:17	07:50	09:04
04-Mar	07:12	18:19	07:49	09:04
05-Mar	07:10	18:21	07:49	09:03
06-Mar	07:07	18:23	07:48	09:03
07-Mar	07:05	18:25	07:48	09:02
08-Mar	07:03	18:26	07:47	09:02
09-Mar	07:00	18:28	07:47	09:01

10-Mar	06:58	18:30	07:47	09:00
11-Mar	06:56	18:32	07:47	08:59
12-Mar	06:54	18:33	07:47	08:58
13-Mar	06:51	18:35	07:47	08:57
14-Mar	06:49	18:37	07:47	08:56
15-Mar	06:47	18:39	07:47	08:54
16-Mar	06:44	18:40	07:48	08:53
17-Mar	06:42	18:42	07:48	08:52
18-Mar	06:40	18:44	07:49	08:50
19-Mar	06:37	18:46	07:49	08:49
20-Mar	06:35	18:47	07:50	08:47
21-Mar	06:33	18:49	07:51	08:46
22-Mar	06:31	18:51	07:52	08:44
23-Mar	06:28	18:53	07:53	08:42
24-Mar	06:26	18:54	07:55	08:39
25-Mar	06:24	18:56	07:57	08:36
26-Mar	06:21	18:58	07:59	08:32
27-Mar	06:19	18:59	08:02	08:26
28-Mar	06:17	19:01	08:08	08:18
14-Sep	06:07	18:50	07:58	08:09
15-Sep	06:09	18:47	07:52	08:16
16-Sep	06:10	18:45	07:48	08:22
17-Sep	06:12	18:43	07:45	08:25
18-Sep	06:13	18:40	07:43	08:27
19-Sep	06:15	18:38	07:41	08:29
20-Sep	06:17	18:36	07:39	08:30
21-Sep	06:18	18:33	07:37	08:32
22-Sep	06:20	18:31	07:35	08:33
23-Sep	06:22	18:29	07:34	08:34
24-Sep	06:23	18:26	07:33	08:34
25-Sep	06:25	18:24	07:31	08:35
26-Sep	06:27	18:22	07:30	08:36
27-Sep	06:28	18:19	07:29	08:36
28-Sep	06:30	18:17	07:29	08:37
29-Sep	06:32	18:15	07:28	08:38
30-Sep	06:33	18:12	07:27	08:38
01-Oct	06:35	18:10	07:27	08:39
02-Oct	06:37	18:08	07:26	08:39
03-Oct	06:38	18:05	07:26	08:39
04-Oct	06:40	18:03	07:25	08:40
05-Oct	06:42	18:01	07:25	08:40
06-Oct	06:43	17:58	07:25	08:40
07-Oct	06:45	17:56	07:25	08:40
08-Oct	06:47	17:54	07:25	08:39
09-Oct	06:49	17:52	07:25	08:39
10-Oct	06:50	17:49	07:25	08:39
11-Oct	06:52	17:47	07:25	08:39
12-Oct	06:54	17:45	07:26	08:38
13-Oct	06:55	17:43	07:26	08:38
14-Oct	06:57	17:41	07:27	08:37
15-Oct	06:59	17:38	07:27	08:36
16-Oct	07:01	17:36	07:28	08:36
17-Oct	07:02	17:34	07:29	08:35
18-Oct	07:04	17:32	07:30	08:34
19-Oct	07:06	17:30	07:32	08:33
20-Oct	07:08	17:28	07:33	08:32
21-Oct	07:09	17:26	07:35	08:31
22-Oct	07:11	17:24	07:37	08:30
23-Oct	07:13	17:22	07:39	08:29

24-Oct	07:15	17:19	07:41	08:27
25-Oct	07:17	17:17	07:43	08:26
26-Oct	07:18	17:15	07:44	08:24
27-Oct	07:20	17:14	07:46	08:22
28-Oct	07:22	17:12	07:48	08:20
29-Oct	07:24	17:10	07:51	08:17
30-Oct	07:26	17:08	07:54	08:14
31-Oct	07:27	17:06	08:01	08:06

Turbine 6

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
08-Mar	07:03	18:26	17:56	18:03
09-Mar	07:00	18:28	17:51	18:07
10-Mar	06:58	18:30	17:48	18:09
11-Mar	06:56	18:32	17:46	18:10
12-Mar	06:54	18:33	17:44	18:12
13-Mar	06:51	18:35	17:43	18:13
14-Mar	06:49	18:37	17:42	18:14
15-Mar	06:47	18:39	17:41	18:15
16-Mar	06:44	18:40	17:40	18:21
17-Mar	06:42	18:42	17:40	18:24
18-Mar	06:40	18:44	17:39	18:26
19-Mar	06:37	18:46	17:39	18:28
20-Mar	06:35	18:47	17:39	18:29
21-Mar	06:33	18:49	17:39	18:30
22-Mar	06:31	18:51	17:39	18:32
23-Mar	06:28	18:53	17:40	18:33
24-Mar	06:26	18:54	17:40	18:35
25-Mar	06:24	18:56	17:41	18:36
26-Mar	06:21	18:58	17:43	18:39
27-Mar	06:19	18:59	17:44	18:42
28-Mar	06:17	19:01	17:46	18:43
29-Mar	06:14	19:03	17:48	18:45
30-Mar	06:12	19:05	18:01	18:46
31-Mar	06:10	19:06	18:01	18:48
01-Apr	06:07	19:08	18:03	18:50
02-Apr	06:05	19:10	18:04	18:51
03-Apr	06:03	19:11	18:06	18:53
04-Apr	06:00	19:13	18:06	18:54
05-Apr	05:58	19:15	18:07	18:55
06-Apr	05:56	19:17	18:08	18:55
07-Apr	05:54	19:18	18:09	18:55
08-Apr	05:51	19:20	18:11	18:55
09-Apr	05:49	19:22	18:14	18:55
10-Apr	05:47	19:23	18:20	18:55
11-Apr	05:45	19:25	18:22	18:54
12-Apr	05:42	19:27	18:24	18:53
13-Apr	05:40	19:29	18:26	18:53
14-Apr	05:38	19:30	18:28	18:51
15-Apr	05:36	19:32	18:29	18:50
16-Apr	05:34	19:34	18:30	18:48
17-Apr	05:31	19:35	18:33	18:46
18-Apr	05:29	19:37	18:36	18:42
21-Apr	05:23	19:42	05:39	05:45
22-Apr	05:21	19:44	05:33	05:50
23-Apr	05:19	19:46	05:30	05:53
24-Apr	05:17	19:47	05:28	05:55
25-Apr	05:15	19:49	05:26	05:56
26-Apr	05:13	19:51	05:25	05:57

27-Apr	05:11	19:53	05:22	05:58
28-Apr	05:09	19:54	05:20	05:59
29-Apr	05:07	19:56	05:19	06:00
30-Apr	05:05	19:58	05:17	06:00
01-May	05:03	19:59	05:16	06:01
02-May	05:01	20:01	05:15	06:01
03-May	04:59	20:03	05:14	06:01
04-May	04:57	20:04	05:13	06:02
05-May	04:55	20:06	05:13	06:02
06-May	04:54	20:08	05:12	06:02
07-May	04:52	20:09	05:12	06:02
08-May	04:50	20:11	05:11	06:02
09-May	04:48	20:12	05:11	06:02
10-May	04:47	20:14	05:11	06:02
11-May	04:45	20:16	05:10	06:02
12-May	04:43	20:17	05:10	06:01
13-May	04:42	20:19	05:10	06:01
14-May	04:40	20:20	05:10	06:01
15-May	04:39	20:22	05:10	06:01
16-May	04:37	20:23	05:10	06:00
17-May	04:36	20:25	05:11	06:00
18-May	04:34	20:26	05:11	05:59
19-May	04:33	20:28	05:11	05:59
20-May	04:32	20:29	05:11	05:59
21-May	04:30	20:31	05:12	05:58
22-May	04:29	20:32	05:12	05:58
23-May	04:28	20:34	05:13	05:57
24-May	04:27	20:35	05:13	05:56
25-May	04:25	20:36	05:14	05:56
26-May	04:24	20:38	05:14	05:55
27-May	04:23	20:39	05:15	05:54
28-May	04:22	20:40	05:15	05:53
29-May	04:21	20:41	05:16	05:53
30-May	04:20	20:42	05:17	05:52
31-May	04:20	20:44	05:17	05:52
01-Jun	04:19	20:45	05:18	05:52
02-Jun	04:18	20:46	05:19	05:51
03-Jun	04:17	20:47	05:20	05:51
04-Jun	04:16	20:48	05:21	05:51
05-Jun	04:16	20:49	05:21	05:50
06-Jun	04:15	20:50	05:22	05:50
07-Jun	04:15	20:50	05:23	05:49
08-Jun	04:14	20:51	05:24	05:49
09-Jun	04:14	20:52	05:25	05:49
10-Jun	04:13	20:53	05:25	05:48
11-Jun	04:13	20:54	05:26	05:48
12-Jun	04:13	20:54	05:27	05:48
13-Jun	04:13	20:55	05:28	05:47
14-Jun	04:13	20:55	05:29	05:47
15-Jun	04:12	20:56	05:29	05:47
16-Jun	04:12	20:56	05:30	05:47
17-Jun	04:12	20:57	05:30	05:47
18-Jun	04:12	20:57	05:31	05:47
19-Jun	04:13	20:57	05:31	05:47
20-Jun	04:13	20:58	05:32	05:47
21-Jun	04:13	20:58	05:32	05:47
22-Jun	04:13	20:58	05:32	05:47
23-Jun	04:13	20:58	05:32	05:48
24-Jun	04:14	20:58	05:32	05:48

25-Jun	04:14	20:58	05:32	05:49
26-Jun	04:15	20:58	05:32	05:49
27-Jun	04:15	20:58	05:31	05:50
28-Jun	04:16	20:58	05:31	05:50
29-Jun	04:16	20:57	05:31	05:51
30-Jun	04:17	20:57	05:30	05:52
01-Jul	04:18	20:57	05:30	05:53
02-Jul	04:18	20:56	05:30	05:53
03-Jul	04:19	20:56	05:29	05:54
04-Jul	04:20	20:55	05:29	05:55
05-Jul	04:21	20:55	05:28	05:56
06-Jul	04:22	20:54	05:28	05:56
07-Jul	04:23	20:54	05:27	05:57
08-Jul	04:24	20:53	05:27	05:58
09-Jul	04:25	20:52	05:26	05:58
10-Jul	04:26	20:51	05:26	05:59
11-Jul	04:27	20:50	05:26	06:00
12-Jul	04:28	20:50	05:25	06:00
13-Jul	04:29	20:49	05:25	06:01
14-Jul	04:30	20:48	05:24	06:02
15-Jul	04:32	20:47	05:24	06:03
16-Jul	04:33	20:46	05:23	06:04
17-Jul	04:34	20:44	05:23	06:05
18-Jul	04:35	20:43	05:23	06:05
19-Jul	04:37	20:42	05:22	06:06
20-Jul	04:38	20:41	05:22	06:07
21-Jul	04:39	20:40	05:22	06:08
22-Jul	04:41	20:38	05:22	06:08
23-Jul	04:42	20:37	05:21	06:09
24-Jul	04:44	20:35	05:21	06:09
25-Jul	04:45	20:34	05:21	06:10
26-Jul	04:46	20:32	05:21	06:10
27-Jul	04:48	20:31	05:21	06:11
28-Jul	04:49	20:29	05:20	06:11
29-Jul	04:51	20:28	05:20	06:11
30-Jul	04:52	20:26	05:20	06:11
31-Jul	04:54	20:25	05:20	06:11
01-Aug	04:56	20:23	05:20	06:12
02-Aug	04:57	20:21	05:20	06:12
03-Aug	04:59	20:19	05:21	06:12
04-Aug	05:00	20:18	05:21	06:11
05-Aug	05:02	20:16	05:21	06:11
06-Aug	05:03	20:14	05:21	06:11
07-Aug	05:05	20:12	05:22	06:11
08-Aug	05:07	20:10	05:22	06:10
09-Aug	05:08	20:08	05:23	06:10
10-Aug	05:10	20:07	05:24	06:09
11-Aug	05:11	20:05	05:24	06:09
12-Aug	05:13	20:03	05:25	06:08
13-Aug	05:15	20:01	05:27	06:07
14-Aug	05:16	19:59	05:28	06:06
15-Aug	05:18	19:57	05:30	06:05
16-Aug	05:20	19:55	05:32	06:03
17-Aug	05:21	19:52	05:33	06:02
18-Aug	05:23	19:50	05:34	06:00
19-Aug	05:24	19:48	05:36	05:57
20-Aug	05:26	19:46	05:39	05:54
23-Aug	05:31	19:40	18:38	18:47
24-Aug	05:33	19:38	18:35	18:49

25-Aug	05:34	19:35	18:32	18:51
26-Aug	05:36	19:33	18:30	18:52
27-Aug	05:38	19:31	18:29	18:53
28-Aug	05:39	19:29	18:26	18:53
29-Aug	05:41	19:27	18:23	18:54
30-Aug	05:42	19:24	18:21	18:54
31-Aug	05:44	19:22	18:19	18:54
01-Sep	05:46	19:20	18:12	18:53
02-Sep	05:47	19:17	18:09	18:53
03-Sep	05:49	19:15	18:06	18:52
04-Sep	05:51	19:13	18:04	18:51
05-Sep	05:52	19:11	18:03	18:50
06-Sep	05:54	19:08	18:02	18:49
07-Sep	05:55	19:06	18:00	18:48
08-Sep	05:57	19:04	17:58	18:45
09-Sep	05:59	19:01	17:56	18:43
10-Sep	06:00	18:59	17:54	18:40
11-Sep	06:02	18:57	17:53	18:38
12-Sep	06:04	18:54	17:40	18:37
13-Sep	06:05	18:52	17:37	18:34
14-Sep	06:07	18:50	17:35	18:32
15-Sep	06:09	18:47	17:32	18:29
16-Sep	06:10	18:45	17:30	18:25
17-Sep	06:12	18:43	17:29	18:23
18-Sep	06:13	18:40	17:27	18:21
19-Sep	06:15	18:38	17:26	18:19
20-Sep	06:17	18:36	17:25	18:16
21-Sep	06:18	18:33	17:25	18:15
22-Sep	06:20	18:31	17:24	18:13
23-Sep	06:22	18:29	17:24	18:11
24-Sep	06:23	18:26	17:23	18:09
25-Sep	06:25	18:24	17:23	18:05
26-Sep	06:27	18:22	17:23	17:57
27-Sep	06:28	18:19	17:24	17:56
28-Sep	06:30	18:17	17:24	17:55
29-Sep	06:32	18:15	17:25	17:53
30-Sep	06:33	18:12	17:25	17:51
01-Oct	06:35	18:10	17:27	17:49
02-Oct	06:37	18:08	17:29	17:47
03-Oct	06:38	18:05	17:32	17:43

Turbine 7

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
22-Feb	07:36	17:59	08:12	08:19
23-Feb	07:33	18:01	08:04	08:20
24-Feb	07:31	18:03	07:54	08:20
25-Feb	07:29	18:05	07:53	08:20
26-Feb	07:27	18:07	07:52	08:20
27-Feb	07:25	18:08	07:52	08:20
28-Feb	07:23	18:10	07:52	08:19
29-Feb	07:21	18:12	07:52	08:18
01-Mar	07:18	18:14	07:52	08:17
02-Mar	07:16	18:16	07:53	08:16
03-Mar	07:14	18:17	07:54	08:15
04-Mar	07:12	18:19	07:41	08:13
05-Mar	07:10	18:21	07:40	08:10
06-Mar	07:07	18:23	07:37	08:06
07-Mar	07:05	18:25	07:38	08:06
08-Mar	07:03	18:26	07:38	08:04

09-Mar	07:00	18:28	07:39	08:03
10-Mar	06:58	18:30	07:40	08:01
11-Mar	06:56	18:32	07:42	07:58
12-Mar	06:54	18:33	07:45	07:54
30-Sep	06:33	18:12	07:26	07:33
01-Oct	06:35	18:10	07:22	07:37
02-Oct	06:37	18:08	07:20	07:39
03-Oct	06:38	18:05	07:18	07:41
04-Oct	06:40	18:03	07:16	07:42
05-Oct	06:42	18:01	07:15	07:43
06-Oct	06:43	17:58	07:14	07:43
07-Oct	06:45	17:56	07:17	07:46
08-Oct	06:47	17:54	07:16	07:48
09-Oct	06:49	17:52	07:26	07:50
10-Oct	06:50	17:49	07:28	07:51
11-Oct	06:52	17:47	07:27	07:51
12-Oct	06:54	17:45	07:26	07:52
13-Oct	06:55	17:43	07:25	07:52
14-Oct	06:57	17:41	07:25	07:53
15-Oct	06:59	17:38	07:25	07:53
16-Oct	07:01	17:36	07:24	07:52
17-Oct	07:02	17:34	07:26	07:52
18-Oct	07:04	17:32	07:31	07:52
19-Oct	07:06	17:30	07:40	07:51
20-Oct	07:08	17:28	07:48	07:50

Turbine 8

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	09:12	10:13
02-Jan	08:42	16:33	09:12	10:14
03-Jan	08:42	16:34	09:12	10:14
04-Jan	08:41	16:35	09:13	10:14
05-Jan	08:41	16:36	09:13	10:15
06-Jan	08:41	16:38	09:12	10:15
07-Jan	08:40	16:39	09:11	10:16
08-Jan	08:40	16:40	09:09	10:16
09-Jan	08:39	16:42	09:08	10:16
10-Jan	08:39	16:43	09:07	10:17
11-Jan	08:38	16:44	09:05	10:17
12-Jan	08:38	16:46	09:03	10:17
13-Jan	08:37	16:47	09:02	10:17
14-Jan	08:36	16:49	09:02	10:17
15-Jan	08:35	16:50	09:00	10:18
16-Jan	08:34	16:52	09:00	10:18
17-Jan	08:33	16:54	09:00	10:18
18-Jan	08:33	16:55	09:00	10:18
19-Jan	08:32	16:57	09:00	10:17
20-Jan	08:30	16:59	09:00	10:17
21-Jan	08:29	17:00	09:00	10:17
22-Jan	08:28	17:02	09:00	10:20
23-Jan	08:27	17:04	09:00	10:20
24-Jan	08:26	17:06	09:00	10:19
25-Jan	08:24	17:07	09:01	10:18
26-Jan	08:23	17:09	09:01	10:17
27-Jan	08:22	17:11	09:01	09:31
27-Jan	08:22	17:11	09:30	10:16
28-Jan	08:20	17:13	09:02	09:31
28-Jan	08:20	17:13	09:36	10:15
29-Jan	08:19	17:15	09:03	09:31

29-Jan	08:19	17:15	09:37	10:13
30-Jan	08:17	17:16	09:03	09:30
30-Jan	08:17	17:16	09:39	10:12
31-Jan	08:16	17:18	09:04	09:29
31-Jan	08:16	17:18	09:41	10:09
01-Feb	08:14	17:20	09:05	09:28
01-Feb	08:14	17:20	09:44	10:04
02-Feb	08:13	17:22	09:05	09:27
02-Feb	08:13	17:22	09:48	09:59
03-Feb	08:11	17:24	09:01	09:25
04-Feb	08:10	17:26	08:56	09:23
05-Feb	08:08	17:27	08:51	09:20
06-Feb	08:06	17:29	08:46	09:18
07-Feb	08:05	17:31	08:41	09:18
08-Feb	08:03	17:33	08:41	09:18
09-Feb	08:01	17:35	08:37	09:18
10-Feb	07:59	17:37	08:37	09:17
11-Feb	07:57	17:39	08:38	09:17
12-Feb	07:55	17:41	08:38	09:16
13-Feb	07:54	17:42	08:39	09:16
14-Feb	07:52	17:44	08:39	09:15
15-Feb	07:50	17:46	08:40	09:14
16-Feb	07:48	17:48	08:41	09:12
17-Feb	07:46	17:50	08:42	09:11
18-Feb	07:44	17:52	08:44	09:08
19-Feb	07:42	17:54	08:40	09:06
20-Feb	07:40	17:55	08:32	09:03
21-Feb	07:38	17:57	08:24	08:50
22-Feb	07:36	17:59	08:14	08:50
23-Feb	07:33	18:01	08:10	08:49
24-Feb	07:31	18:03	08:09	08:49
25-Feb	07:29	18:05	08:09	08:48
26-Feb	07:27	18:07	08:04	08:47
27-Feb	07:25	18:08	08:04	08:46
28-Feb	07:23	18:10	07:59	08:44
29-Feb	07:21	18:12	07:57	08:42
01-Mar	07:18	18:14	07:57	08:40
02-Mar	07:16	18:16	07:57	08:37
03-Mar	07:14	18:17	07:54	08:35
04-Mar	07:12	18:19	07:55	08:33
05-Mar	07:10	18:21	07:55	08:30
06-Mar	07:07	18:23	07:56	08:27
07-Mar	07:05	18:25	07:57	08:25
08-Mar	07:03	18:26	07:59	08:22
09-Mar	07:00	18:28	08:01	08:18
10-Mar	06:58	18:30	08:06	08:14
27-Mar	06:19	18:59	06:47	06:59
28-Mar	06:17	19:01	06:45	07:13
29-Mar	06:14	19:03	06:44	07:13
30-Mar	06:12	19:05	06:43	07:13
31-Mar	06:10	19:06	06:36	06:43
31-Mar	06:10	19:06	06:43	07:12
01-Apr	06:07	19:08	06:29	07:12
02-Apr	06:05	19:10	06:27	07:11
03-Apr	06:03	19:11	06:25	07:10
04-Apr	06:00	19:13	06:23	07:08
05-Apr	05:58	19:15	06:22	07:07
06-Apr	05:56	19:17	06:20	07:05
07-Apr	05:54	19:18	06:18	07:02

08-Apr	05:51	19:20	06:16	06:59
09-Apr	05:49	19:22	06:14	06:58
10-Apr	05:47	19:23	06:10	06:57
11-Apr	05:45	19:25	06:07	06:56
12-Apr	05:42	19:27	06:04	06:56
13-Apr	05:40	19:29	06:02	06:55
14-Apr	05:38	19:30	06:00	06:55
15-Apr	05:36	19:32	05:58	06:54
16-Apr	05:34	19:34	05:57	06:53
17-Apr	05:31	19:35	05:56	06:52
18-Apr	05:29	19:37	05:55	06:51
19-Apr	05:27	19:39	05:54	06:50
20-Apr	05:25	19:41	05:53	06:49
21-Apr	05:23	19:42	05:52	06:47
22-Apr	05:21	19:44	05:52	06:45
23-Apr	05:19	19:46	05:51	06:43
24-Apr	05:17	19:47	05:51	06:40
25-Apr	05:15	19:49	05:51	06:33
26-Apr	05:13	19:51	05:51	06:33
27-Apr	05:11	19:53	05:51	06:32
28-Apr	05:09	19:54	05:51	06:31
29-Apr	05:07	19:56	05:51	06:31
30-Apr	05:05	19:58	05:52	06:30
01-May	05:03	19:59	05:52	06:29
02-May	05:01	20:01	05:53	06:28
03-May	04:59	20:03	05:54	06:27
04-May	04:57	20:04	05:55	06:25
05-May	04:55	20:06	05:56	06:24
06-May	04:54	20:08	05:57	06:22
07-May	04:52	20:09	05:59	06:19
08-May	04:50	20:11	06:01	06:17
09-May	04:48	20:12	06:04	06:14
03-Aug	04:59	20:19	06:12	06:25
04-Aug	05:00	20:18	06:09	06:28
05-Aug	05:02	20:16	06:07	06:30
06-Aug	05:03	20:14	06:06	06:32
07-Aug	05:05	20:12	06:04	06:34
08-Aug	05:07	20:10	06:03	06:35
09-Aug	05:08	20:08	06:02	06:36
10-Aug	05:10	20:07	06:01	06:37
11-Aug	05:11	20:05	06:00	06:37
12-Aug	05:13	20:03	05:59	06:38
13-Aug	05:15	20:01	05:59	06:38
14-Aug	05:16	19:59	05:58	06:39
15-Aug	05:18	19:57	05:58	06:39
16-Aug	05:20	19:55	05:57	06:39
17-Aug	05:21	19:52	05:57	06:43
18-Aug	05:23	19:50	05:57	06:47
19-Aug	05:24	19:48	05:57	06:49
20-Aug	05:26	19:46	05:57	06:51
21-Aug	05:28	19:44	05:57	06:52
22-Aug	05:29	19:42	05:57	06:53
23-Aug	05:31	19:40	05:57	06:54
24-Aug	05:33	19:38	05:58	06:54
25-Aug	05:34	19:35	05:58	06:55
26-Aug	05:36	19:33	05:59	06:55
27-Aug	05:38	19:31	06:00	06:56
28-Aug	05:39	19:29	06:01	06:56
29-Aug	05:41	19:27	06:03	06:56

30-Aug	05:42	19:24	06:05	06:56
31-Aug	05:44	19:22	06:06	06:55
01-Sep	05:46	19:20	06:09	06:55
02-Sep	05:47	19:17	06:12	06:56
03-Sep	05:49	19:15	06:14	06:57
04-Sep	05:51	19:13	06:15	06:17
04-Sep	05:51	19:13	06:16	07:00
05-Sep	05:52	19:11	06:17	07:01
06-Sep	05:54	19:08	06:17	07:03
07-Sep	05:55	19:06	06:18	07:04
08-Sep	05:57	19:04	06:19	07:04
09-Sep	05:59	19:01	06:21	07:05
10-Sep	06:00	18:59	06:22	07:05
11-Sep	06:02	18:57	06:28	06:35
11-Sep	06:02	18:57	06:35	07:05
12-Sep	06:04	18:54	06:35	07:05
13-Sep	06:05	18:52	06:35	07:04
14-Sep	06:07	18:50	06:35	07:03
15-Sep	06:09	18:47	06:37	06:50
02-Oct	06:37	18:08	07:47	07:50
03-Oct	06:38	18:05	07:40	07:56
04-Oct	06:40	18:03	07:37	07:59
05-Oct	06:42	18:01	07:35	08:01
06-Oct	06:43	17:58	07:33	08:03
07-Oct	06:45	17:56	07:32	08:06
08-Oct	06:47	17:54	07:31	08:08
09-Oct	06:49	17:52	07:30	08:10
10-Oct	06:50	17:49	07:29	08:12
11-Oct	06:52	17:47	07:31	08:13
12-Oct	06:54	17:45	07:31	08:16
13-Oct	06:55	17:43	07:30	08:17
14-Oct	06:57	17:41	07:37	08:18
15-Oct	06:59	17:38	07:37	08:19
16-Oct	07:01	17:36	07:39	08:20
17-Oct	07:02	17:34	07:41	08:21
18-Oct	07:04	17:32	07:41	08:21
19-Oct	07:06	17:30	07:45	08:21
20-Oct	07:08	17:28	07:51	08:21
21-Oct	07:09	17:26	07:59	08:21
21-Oct	07:09	17:26	08:21	08:33
22-Oct	07:11	17:24	08:07	08:36
23-Oct	07:13	17:22	08:15	08:38
24-Oct	07:15	17:19	08:13	08:40
25-Oct	07:17	17:17	08:11	08:42
26-Oct	07:18	17:15	08:10	08:43
27-Oct	07:20	17:14	08:09	08:44
28-Oct	07:22	17:12	08:08	08:45
29-Oct	07:24	17:10	08:08	08:46
30-Oct	07:26	17:08	08:07	08:46
31-Oct	07:27	17:06	08:07	08:47
01-Nov	07:29	17:04	08:07	08:47
02-Nov	07:31	17:02	08:07	08:47
03-Nov	07:33	17:00	08:11	08:47
04-Nov	07:35	16:59	08:12	08:47
05-Nov	07:36	16:57	08:17	08:47
06-Nov	07:38	16:55	08:23	08:51
07-Nov	07:40	16:54	08:28	08:54
08-Nov	07:42	16:52	08:33	08:56
09-Nov	07:44	16:50	08:36	08:58

09-Nov	07:44	16:50	09:16	09:31
10-Nov	07:45	16:49	08:35	08:59
10-Nov	07:45	16:49	09:13	09:37
11-Nov	07:47	16:47	08:35	09:00
11-Nov	07:47	16:47	09:11	09:41
12-Nov	07:49	16:46	08:34	09:01
12-Nov	07:49	16:46	09:09	09:44
13-Nov	07:51	16:44	08:34	09:02
13-Nov	07:51	16:44	09:08	09:45
14-Nov	07:52	16:43	08:34	09:03
14-Nov	07:52	16:43	09:05	09:47
15-Nov	07:54	16:41	08:33	09:49
16-Nov	07:56	16:40	08:33	09:50
17-Nov	07:58	16:39	08:33	09:52
18-Nov	07:59	16:37	08:34	09:53
19-Nov	08:01	16:36	08:34	09:54
20-Nov	08:03	16:35	08:34	09:55
21-Nov	08:04	16:34	08:35	09:52
22-Nov	08:06	16:33	08:35	09:53
23-Nov	08:08	16:32	08:36	09:54
24-Nov	08:09	16:31	08:36	09:54
25-Nov	08:11	16:30	08:37	09:55
26-Nov	08:13	16:29	08:38	09:56
27-Nov	08:14	16:28	08:39	09:56
28-Nov	08:16	16:27	08:41	09:57
29-Nov	08:17	16:26	08:42	09:57
30-Nov	08:18	16:26	08:44	09:58
01-Dec	08:20	16:25	08:47	09:58
02-Dec	08:21	16:24	08:49	09:59
03-Dec	08:23	16:24	08:51	09:59
04-Dec	08:24	16:23	08:54	10:00
05-Dec	08:25	16:23	08:56	10:00
06-Dec	08:27	16:22	08:58	10:01
07-Dec	08:28	16:22	08:59	10:01
08-Dec	08:29	16:22	09:00	10:02
09-Dec	08:30	16:22	09:01	10:02
10-Dec	08:31	16:22	09:01	10:03
11-Dec	08:32	16:21	09:02	10:03
12-Dec	08:33	16:21	09:02	10:04
13-Dec	08:34	16:21	09:03	10:04
14-Dec	08:35	16:21	09:04	10:05
15-Dec	08:36	16:22	09:04	10:05
16-Dec	08:37	16:22	09:05	10:06
17-Dec	08:37	16:22	09:05	10:06
18-Dec	08:38	16:22	09:06	10:07
19-Dec	08:39	16:23	09:06	10:07
20-Dec	08:39	16:23	09:07	10:08
21-Dec	08:40	16:24	09:07	10:08
22-Dec	08:40	16:24	09:08	10:09
23-Dec	08:41	16:25	09:08	10:09
24-Dec	08:41	16:25	09:09	10:10
25-Dec	08:41	16:26	09:09	10:10
26-Dec	08:42	16:27	09:10	10:11
27-Dec	08:42	16:28	09:10	10:11
28-Dec	08:42	16:29	09:10	10:12
29-Dec	08:42	16:29	09:11	10:12
30-Dec	08:42	16:30	09:11	10:13
31-Dec	08:42	16:31	09:12	10:13

Turbine 9

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
23-Jan	08:27	17:04	08:40	08:43
24-Jan	08:26	17:06	08:36	08:48
25-Jan	08:24	17:07	08:35	08:50
26-Jan	08:23	17:09	08:33	08:52
27-Jan	08:22	17:11	08:32	08:53
28-Jan	08:20	17:13	08:30	08:55
29-Jan	08:19	17:15	08:29	08:56
30-Jan	08:17	17:16	08:28	08:56
31-Jan	08:16	17:18	08:27	08:57
01-Feb	08:14	17:20	08:26	08:58
02-Feb	08:13	17:22	08:26	08:58
03-Feb	08:11	17:24	08:25	08:59
04-Feb	08:10	17:26	08:25	08:59
05-Feb	08:08	17:27	08:25	08:59
06-Feb	08:06	17:29	08:25	08:59
07-Feb	08:05	17:31	08:25	08:59
08-Feb	08:03	17:33	08:25	08:59
09-Feb	08:01	17:35	08:25	08:58
10-Feb	07:59	17:37	08:26	08:58
11-Feb	07:57	17:39	08:26	08:57
12-Feb	07:55	17:41	08:27	08:56
13-Feb	07:54	17:42	08:28	08:54
14-Feb	07:52	17:44	08:29	08:52
15-Feb	07:50	17:46	08:31	08:50
16-Feb	07:48	17:48	08:33	08:47
17-Feb	07:46	17:50	08:38	08:42
25-Oct	07:17	17:17	08:05	08:15
26-Oct	07:18	17:15	08:02	08:19
27-Oct	07:20	17:14	08:00	08:21
28-Oct	07:22	17:12	07:58	08:23
29-Oct	07:24	17:10	07:57	08:25
30-Oct	07:26	17:08	07:56	08:26
31-Oct	07:27	17:06	07:55	08:27
01-Nov	07:29	17:04	07:55	08:27
02-Nov	07:31	17:02	07:55	08:28
03-Nov	07:33	17:00	07:54	08:28
04-Nov	07:35	16:59	07:54	08:28
05-Nov	07:36	16:57	07:55	08:29
06-Nov	07:38	16:55	07:55	08:29
07-Nov	07:40	16:54	07:55	08:29
08-Nov	07:42	16:52	07:56	08:29
09-Nov	07:44	16:50	07:56	08:28
10-Nov	07:45	16:49	07:57	08:28
11-Nov	07:47	16:47	07:58	08:28
12-Nov	07:49	16:46	07:59	08:27
13-Nov	07:51	16:44	08:01	08:27
14-Nov	07:52	16:43	08:02	08:26
15-Nov	07:54	16:41	08:04	08:25
16-Nov	07:56	16:40	08:06	08:24
17-Nov	07:58	16:39	08:08	08:23
18-Nov	07:59	16:37	08:10	08:21

Turbine 10

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
13-May	04:42	20:19	19:53	20:01
14-May	04:40	20:20	19:49	20:04
15-May	04:39	20:22	19:45	20:06

16-May	04:37	20:23	19:43	20:08
17-May	04:36	20:25	19:41	20:09
18-May	04:34	20:26	19:40	20:11
19-May	04:33	20:28	19:39	20:12
20-May	04:32	20:29	19:38	20:13
21-May	04:30	20:31	19:37	20:14
22-May	04:29	20:32	19:37	20:14
23-May	04:28	20:34	19:36	20:16
24-May	04:27	20:35	19:36	20:18
25-May	04:25	20:36	19:35	20:20
26-May	04:24	20:38	19:35	20:21
27-May	04:23	20:39	19:35	20:23
28-May	04:22	20:40	19:34	20:24
29-May	04:21	20:41	19:34	20:25
30-May	04:20	20:42	19:34	20:26
31-May	04:20	20:44	19:34	20:27
01-Jun	04:19	20:45	19:34	20:28
02-Jun	04:18	20:46	19:34	20:29
03-Jun	04:17	20:47	19:34	20:30
04-Jun	04:16	20:48	19:34	20:31
05-Jun	04:16	20:49	19:34	20:31
06-Jun	04:15	20:50	19:34	20:32
07-Jun	04:15	20:50	19:34	20:33
08-Jun	04:14	20:51	19:34	20:34
09-Jun	04:14	20:52	19:35	20:34
10-Jun	04:13	20:53	19:35	20:35
11-Jun	04:13	20:54	19:35	20:35
12-Jun	04:13	20:54	19:35	20:36
13-Jun	04:13	20:55	19:35	20:36
14-Jun	04:13	20:55	19:35	20:36
15-Jun	04:12	20:56	19:36	20:37
16-Jun	04:12	20:56	19:36	20:37
17-Jun	04:12	20:57	19:36	20:37
18-Jun	04:12	20:57	19:36	20:38
19-Jun	04:13	20:57	19:36	20:38
20-Jun	04:13	20:58	19:37	20:38
21-Jun	04:13	20:58	19:37	20:38
22-Jun	04:13	20:58	19:37	20:39
23-Jun	04:13	20:58	19:37	20:39
24-Jun	04:14	20:58	19:37	20:39
25-Jun	04:14	20:58	19:38	20:39
26-Jun	04:15	20:58	19:38	20:39
27-Jun	04:15	20:58	19:38	20:39
28-Jun	04:16	20:58	19:38	20:39
29-Jun	04:16	20:57	19:39	20:39
30-Jun	04:17	20:57	19:39	20:39
01-Jul	04:18	20:57	19:39	20:39
02-Jul	04:18	20:56	19:39	20:39
03-Jul	04:19	20:56	19:40	20:38
04-Jul	04:20	20:55	19:40	20:38
05-Jul	04:21	20:55	19:40	20:38
06-Jul	04:22	20:54	19:40	20:37
07-Jul	04:23	20:54	19:41	20:36
08-Jul	04:24	20:53	19:41	20:36
09-Jul	04:25	20:52	19:41	20:35
10-Jul	04:26	20:51	19:42	20:34
11-Jul	04:27	20:50	19:42	20:34
12-Jul	04:28	20:50	19:42	20:33
13-Jul	04:29	20:49	19:43	20:32

14-Jul	04:30	20:48	19:43	20:31
15-Jul	04:32	20:47	19:44	20:31
16-Jul	04:33	20:46	19:44	20:29
17-Jul	04:34	20:44	19:45	20:28
18-Jul	04:35	20:43	19:45	20:26
19-Jul	04:37	20:42	19:46	20:24
20-Jul	04:38	20:41	19:47	20:24
21-Jul	04:39	20:40	19:48	20:23
22-Jul	04:41	20:38	19:49	20:22
23-Jul	04:42	20:37	19:50	20:21
24-Jul	04:44	20:35	19:51	20:20
25-Jul	04:45	20:34	19:53	20:18
26-Jul	04:46	20:32	19:55	20:17
27-Jul	04:48	20:31	19:57	20:15
28-Jul	04:49	20:29	20:02	20:13

Turbine 11

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	09:07	09:15
02-Jan	08:42	16:33	09:06	09:17
03-Jan	08:42	16:34	09:05	09:19
04-Jan	08:41	16:35	09:04	09:20
05-Jan	08:41	16:36	09:04	09:22
06-Jan	08:41	16:38	09:03	09:23
07-Jan	08:40	16:39	09:03	09:24
08-Jan	08:40	16:40	09:02	09:25
09-Jan	08:39	16:42	09:02	09:26
10-Jan	08:39	16:43	09:01	09:28
11-Jan	08:38	16:44	09:00	09:29
12-Jan	08:38	16:46	09:00	09:30
13-Jan	08:37	16:47	08:59	09:31
14-Jan	08:36	16:49	08:59	09:32
15-Jan	08:35	16:50	08:58	09:32
16-Jan	08:34	16:52	08:58	09:29
17-Jan	08:33	16:54	08:57	09:30
18-Jan	08:33	16:55	08:54	09:31
19-Jan	08:32	16:57	08:53	09:31
20-Jan	08:30	16:59	08:52	09:32
21-Jan	08:29	17:00	08:50	09:33
22-Jan	08:28	17:02	08:49	09:33
23-Jan	08:27	17:04	08:49	09:34
24-Jan	08:26	17:06	08:48	09:38
25-Jan	08:24	17:07	08:48	09:38
26-Jan	08:23	17:09	08:47	09:39
27-Jan	08:22	17:11	08:47	09:39
28-Jan	08:20	17:13	08:46	09:39
29-Jan	08:19	17:15	08:46	09:39
30-Jan	08:17	17:16	08:46	09:39
31-Jan	08:16	17:18	08:43	09:39
01-Feb	08:14	17:20	08:38	09:38
02-Feb	08:13	17:22	08:34	09:38
03-Feb	08:11	17:24	08:33	09:38
04-Feb	08:10	17:26	08:30	09:37
05-Feb	08:08	17:27	08:29	09:36
06-Feb	08:06	17:29	08:29	09:35
07-Feb	08:05	17:31	08:28	09:34
08-Feb	08:03	17:33	08:28	09:32
09-Feb	08:01	17:35	08:27	09:30
10-Feb	07:59	17:37	08:27	09:27

11-Feb	07:57	17:39	08:14	08:27
11-Feb	07:57	17:39	08:27	09:24
12-Feb	07:55	17:41	08:11	09:21
13-Feb	07:54	17:42	08:09	09:19
14-Feb	07:52	17:44	08:07	09:17
15-Feb	07:50	17:46	08:05	09:14
16-Feb	07:48	17:48	08:03	09:10
17-Feb	07:46	17:50	08:01	09:04
18-Feb	07:44	17:52	07:59	09:03
19-Feb	07:42	17:54	07:58	09:02
20-Feb	07:40	17:55	07:57	09:00
21-Feb	07:38	17:57	07:56	08:59
22-Feb	07:36	17:59	07:56	08:56
23-Feb	07:33	18:01	07:55	08:54
24-Feb	07:31	18:03	07:55	08:37
24-Feb	07:31	18:03	08:40	08:50
25-Feb	07:29	18:05	07:54	08:37
26-Feb	07:27	18:07	07:54	08:36
27-Feb	07:25	18:08	07:54	08:35
28-Feb	07:23	18:10	07:55	08:34
29-Feb	07:21	18:12	07:55	08:33
01-Mar	07:18	18:14	07:55	08:32
02-Mar	07:16	18:16	07:56	08:30
03-Mar	07:14	18:17	07:57	08:28
04-Mar	07:12	18:19	07:58	08:25
05-Mar	07:10	18:21	08:00	08:20
06-Mar	07:07	18:23	08:03	08:15
21-Mar	06:33	18:49	06:46	07:08
22-Mar	06:31	18:51	06:44	07:08
23-Mar	06:28	18:53	06:43	07:09
24-Mar	06:26	18:54	06:42	07:09
25-Mar	06:24	18:56	06:41	07:09
26-Mar	06:21	18:58	06:40	07:09
27-Mar	06:19	18:59	06:40	07:09
28-Mar	06:17	19:01	06:40	07:08
29-Mar	06:14	19:03	06:40	07:08
30-Mar	06:12	19:05	06:40	07:07
31-Mar	06:10	19:06	06:41	07:06
01-Apr	06:07	19:08	06:41	07:04
02-Apr	06:05	19:10	06:19	06:26
02-Apr	06:05	19:10	06:42	07:02
03-Apr	06:03	19:11	06:16	06:35
03-Apr	06:03	19:11	06:44	07:00
04-Apr	06:00	19:13	06:14	06:36
04-Apr	06:00	19:13	06:47	06:57
05-Apr	05:58	19:15	06:12	06:37
06-Apr	05:56	19:17	06:10	06:38
07-Apr	05:54	19:18	06:08	06:38
08-Apr	05:51	19:20	06:06	06:38
09-Apr	05:49	19:22	06:04	06:38
10-Apr	05:47	19:23	06:02	06:38
11-Apr	05:45	19:25	05:59	06:38
12-Apr	05:42	19:27	05:57	06:37
13-Apr	05:40	19:29	05:55	06:36
14-Apr	05:38	19:30	05:53	06:36
15-Apr	05:36	19:32	05:51	06:35
16-Apr	05:34	19:34	05:49	06:33
17-Apr	05:31	19:35	05:47	06:32
18-Apr	05:29	19:37	05:45	06:29

19-Apr	05:27	19:39	05:44	06:27
20-Apr	05:25	19:41	05:43	06:24
21-Apr	05:23	19:42	05:42	06:22
22-Apr	05:21	19:44	05:38	06:20
23-Apr	05:19	19:46	05:36	06:18
24-Apr	05:17	19:47	05:34	06:16
25-Apr	05:15	19:49	05:32	06:15
26-Apr	05:13	19:51	05:31	06:14
27-Apr	05:11	19:53	05:30	06:13
28-Apr	05:09	19:54	05:29	06:12
29-Apr	05:07	19:56	05:29	06:10
30-Apr	05:05	19:58	05:28	06:08
01-May	05:03	19:59	05:28	06:07
02-May	05:01	20:01	05:28	06:05
03-May	04:59	20:03	05:28	06:04
04-May	04:57	20:04	05:28	06:01
05-May	04:55	20:06	05:28	05:57
06-May	04:54	20:08	05:28	05:56
07-May	04:52	20:09	05:29	05:55
08-May	04:50	20:11	05:29	05:54
09-May	04:48	20:12	05:30	05:53
10-May	04:47	20:14	05:31	05:52
11-May	04:45	20:16	05:32	05:50
12-May	04:43	20:17	05:34	05:48
13-May	04:42	20:19	05:36	05:46
28-May	04:22	20:40	04:40	04:46
29-May	04:21	20:41	04:38	04:49
30-May	04:20	20:42	04:36	04:50
31-May	04:20	20:44	04:35	04:52
01-Jun	04:19	20:45	04:34	04:53
02-Jun	04:18	20:46	04:33	04:54
03-Jun	04:17	20:47	04:33	04:55
04-Jun	04:16	20:48	04:32	04:55
05-Jun	04:16	20:49	04:31	04:56
06-Jun	04:15	20:50	04:31	04:57
07-Jun	04:15	20:50	04:30	04:57
08-Jun	04:14	20:51	04:30	04:58
09-Jun	04:14	20:52	04:30	04:58
10-Jun	04:13	20:53	04:29	04:58
11-Jun	04:13	20:54	04:29	04:59
12-Jun	04:13	20:54	04:29	04:59
13-Jun	04:13	20:55	04:28	05:00
14-Jun	04:13	20:55	04:28	05:00
15-Jun	04:12	20:56	04:28	05:00
16-Jun	04:12	20:56	04:28	05:01
17-Jun	04:12	20:57	04:28	05:01
18-Jun	04:12	20:57	04:28	05:01
19-Jun	04:13	20:57	04:28	05:01
20-Jun	04:13	20:58	04:29	05:02
21-Jun	04:13	20:58	04:29	05:02
22-Jun	04:13	20:58	04:29	05:02
23-Jun	04:13	20:58	04:29	05:02
24-Jun	04:14	20:58	04:30	05:02
25-Jun	04:14	20:58	04:30	05:03
26-Jun	04:15	20:58	04:31	05:03
27-Jun	04:15	20:58	04:31	05:03
28-Jun	04:16	20:58	04:31	05:03
29-Jun	04:16	20:57	04:32	05:03
30-Jun	04:17	20:57	04:33	05:03

01-Jul	04:18	20:57	04:33	05:03
02-Jul	04:18	20:56	04:34	05:03
03-Jul	04:19	20:56	04:35	05:03
04-Jul	04:20	20:55	04:36	05:03
05-Jul	04:21	20:55	04:37	05:03
06-Jul	04:22	20:54	04:37	05:02
07-Jul	04:23	20:54	04:38	05:02
08-Jul	04:24	20:53	04:39	05:02
09-Jul	04:25	20:52	04:40	05:01
10-Jul	04:26	20:51	04:41	05:01
11-Jul	04:27	20:50	04:42	05:00
12-Jul	04:28	20:50	04:44	04:59
13-Jul	04:29	20:49	04:45	04:58
14-Jul	04:30	20:48	04:47	04:56
29-Jul	04:51	20:28	05:49	05:54
30-Jul	04:52	20:26	05:45	05:57
31-Jul	04:54	20:25	05:43	05:59
01-Aug	04:56	20:23	05:42	06:01
02-Aug	04:57	20:21	05:41	06:02
03-Aug	04:59	20:19	05:40	06:03
04-Aug	05:00	20:18	05:39	06:04
05-Aug	05:02	20:16	05:38	06:05
06-Aug	05:03	20:14	05:37	06:05
07-Aug	05:05	20:12	05:37	06:08
08-Aug	05:07	20:10	05:37	06:11
09-Aug	05:08	20:08	05:36	06:13
10-Aug	05:10	20:07	05:36	06:14
11-Aug	05:11	20:05	05:36	06:15
12-Aug	05:13	20:03	05:36	06:16
13-Aug	05:15	20:01	05:36	06:18
14-Aug	05:16	19:59	05:36	06:19
15-Aug	05:18	19:57	05:37	06:20
16-Aug	05:20	19:55	05:38	06:21
17-Aug	05:21	19:52	05:38	06:22
18-Aug	05:23	19:50	05:40	06:22
19-Aug	05:24	19:48	05:41	06:24
20-Aug	05:26	19:46	05:43	06:26
21-Aug	05:28	19:44	05:47	06:27
22-Aug	05:29	19:42	05:47	06:28
23-Aug	05:31	19:40	05:48	06:31
24-Aug	05:33	19:38	05:49	06:33
25-Aug	05:34	19:35	05:50	06:34
26-Aug	05:36	19:33	05:51	06:36
27-Aug	05:38	19:31	05:53	06:36
28-Aug	05:39	19:29	05:54	06:37
29-Aug	05:41	19:27	05:55	06:37
30-Aug	05:42	19:24	05:57	06:37
31-Aug	05:44	19:22	05:59	06:37
01-Sep	05:46	19:20	06:01	06:37
02-Sep	05:47	19:17	06:02	06:36
03-Sep	05:49	19:15	06:03	06:36
04-Sep	05:51	19:13	06:05	06:35
05-Sep	05:52	19:11	06:07	06:34
06-Sep	05:54	19:08	06:08	06:33
07-Sep	05:55	19:06	06:09	06:31
07-Sep	05:55	19:06	06:42	06:52
08-Sep	05:57	19:04	06:11	06:29
08-Sep	05:57	19:04	06:38	06:54
09-Sep	05:59	19:01	06:12	06:19

09-Sep	05:59	19:01	06:36	06:56
10-Sep	06:00	18:59	06:34	06:57
11-Sep	06:02	18:57	06:33	06:58
12-Sep	06:04	18:54	06:32	06:58
13-Sep	06:05	18:52	06:31	06:59
14-Sep	06:07	18:50	06:30	06:59
15-Sep	06:09	18:47	06:30	06:58
16-Sep	06:10	18:45	06:30	06:58
17-Sep	06:12	18:43	06:29	06:58
18-Sep	06:13	18:40	06:30	06:57
19-Sep	06:15	18:38	06:30	06:56
20-Sep	06:17	18:36	06:31	06:55
21-Sep	06:18	18:33	06:32	06:54
06-Oct	06:43	17:58	07:41	07:51
07-Oct	06:45	17:56	07:37	07:55
08-Oct	06:47	17:54	07:35	07:59
09-Oct	06:49	17:52	07:33	08:02
10-Oct	06:50	17:49	07:31	08:04
11-Oct	06:52	17:47	07:30	08:06
12-Oct	06:54	17:45	07:29	08:07
13-Oct	06:55	17:43	07:28	08:08
14-Oct	06:57	17:41	07:28	08:08
15-Oct	06:59	17:38	07:27	08:09
16-Oct	07:01	17:36	07:27	08:09
17-Oct	07:02	17:34	07:27	08:09
17-Oct	07:02	17:34	08:15	08:19
18-Oct	07:04	17:32	07:27	08:09
18-Oct	07:04	17:32	08:09	08:25
19-Oct	07:06	17:30	07:27	08:27
20-Oct	07:08	17:28	07:27	08:29
21-Oct	07:09	17:26	07:27	08:30
22-Oct	07:11	17:24	07:28	08:32
23-Oct	07:13	17:22	07:29	08:33
24-Oct	07:15	17:19	07:30	08:34
25-Oct	07:17	17:17	07:31	08:34
26-Oct	07:18	17:15	07:33	08:42
27-Oct	07:20	17:14	07:35	08:45
28-Oct	07:22	17:12	07:38	08:48
29-Oct	07:24	17:10	07:39	08:50
30-Oct	07:26	17:08	07:42	08:51
31-Oct	07:27	17:06	07:45	07:55
31-Oct	07:27	17:06	07:57	08:55
01-Nov	07:29	17:04	07:57	08:58
02-Nov	07:31	17:02	07:57	09:01
03-Nov	07:33	17:00	07:57	09:03
04-Nov	07:35	16:59	07:58	09:04
05-Nov	07:36	16:57	07:59	09:05
06-Nov	07:38	16:55	07:59	09:06
07-Nov	07:40	16:54	08:01	09:07
08-Nov	07:42	16:52	08:03	09:08
09-Nov	07:44	16:50	08:06	09:09
10-Nov	07:45	16:49	08:10	09:09
11-Nov	07:47	16:47	08:15	09:10
12-Nov	07:49	16:46	08:17	09:10
13-Nov	07:51	16:44	08:18	09:10
14-Nov	07:52	16:43	08:18	09:11
15-Nov	07:54	16:41	08:19	09:11
16-Nov	07:56	16:40	08:20	09:11
17-Nov	07:58	16:39	08:21	09:11

18-Nov	07:59	16:37	08:22	09:11
19-Nov	08:01	16:36	08:23	09:07
20-Nov	08:03	16:35	08:24	09:07
21-Nov	08:04	16:34	08:25	09:07
22-Nov	08:06	16:33	08:28	09:07
23-Nov	08:08	16:32	08:29	09:07
24-Nov	08:09	16:31	08:32	09:07
25-Nov	08:11	16:30	08:35	09:07
26-Nov	08:13	16:29	08:36	09:11
27-Nov	08:14	16:28	08:37	09:11
28-Nov	08:16	16:27	08:38	09:11
29-Nov	08:17	16:26	08:39	09:10
30-Nov	08:18	16:26	08:41	09:10
01-Dec	08:20	16:25	08:42	09:10
02-Dec	08:21	16:24	08:43	09:10
03-Dec	08:23	16:24	08:45	09:09
04-Dec	08:24	16:23	08:46	09:09
05-Dec	08:25	16:23	08:48	09:09
06-Dec	08:27	16:22	08:49	09:08
07-Dec	08:28	16:22	08:50	09:08
08-Dec	08:29	16:22	08:52	09:07
09-Dec	08:30	16:22	08:53	09:07
10-Dec	08:31	16:22	08:55	09:06
11-Dec	08:32	16:21	08:57	09:05
12-Dec	08:33	16:21	09:00	09:02
31-Dec	08:42	16:31	09:07	09:15

Turbine 12

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	09:04	09:56
02-Jan	08:42	16:33	09:04	09:56
03-Jan	08:42	16:34	09:04	09:56
04-Jan	08:41	16:35	09:04	09:56
05-Jan	08:41	16:36	09:03	09:55
06-Jan	08:41	16:38	09:04	09:55
07-Jan	08:40	16:39	09:04	09:40
07-Jan	08:40	16:39	09:39	09:55
08-Jan	08:40	16:40	09:04	09:40
08-Jan	08:40	16:40	09:41	09:54
09-Jan	08:39	16:42	09:05	09:40
09-Jan	08:39	16:42	09:43	09:52
10-Jan	08:39	16:43	09:04	09:41
11-Jan	08:38	16:44	09:02	09:41
12-Jan	08:38	16:46	09:03	09:41
13-Jan	08:37	16:47	09:03	09:41
14-Jan	08:36	16:49	09:04	09:41
15-Jan	08:35	16:50	09:04	09:41
16-Jan	08:34	16:52	09:05	09:41
17-Jan	08:33	16:54	09:05	09:40
18-Jan	08:33	16:55	09:06	09:40
19-Jan	08:32	16:57	09:07	09:39
20-Jan	08:30	16:59	09:08	09:38
21-Jan	08:29	17:00	09:09	09:37
22-Jan	08:28	17:02	09:10	09:34
23-Jan	08:27	17:04	09:11	09:32
24-Jan	08:26	17:06	09:13	09:30
25-Jan	08:24	17:07	09:15	09:28
26-Jan	08:23	17:09	09:19	09:24
25-Feb	07:29	18:05	07:42	07:55

26-Feb	07:27	18:07	07:36	07:56
27-Feb	07:25	18:08	07:34	07:57
28-Feb	07:23	18:10	07:32	07:58
29-Feb	07:21	18:12	07:31	07:59
01-Mar	07:18	18:14	07:30	07:59
02-Mar	07:16	18:16	07:26	07:59
03-Mar	07:14	18:17	07:23	07:59
04-Mar	07:12	18:19	07:21	07:59
05-Mar	07:10	18:21	07:19	07:58
06-Mar	07:07	18:23	07:17	07:58
07-Mar	07:05	18:25	07:15	07:57
08-Mar	07:03	18:26	07:13	07:56
09-Mar	07:00	18:28	07:11	07:54
10-Mar	06:58	18:30	07:09	07:52
11-Mar	06:56	18:32	07:08	07:50
12-Mar	06:54	18:33	07:06	07:47
13-Mar	06:51	18:35	07:06	07:44
14-Mar	06:49	18:37	07:04	07:42
15-Mar	06:47	18:39	06:59	07:40
16-Mar	06:44	18:40	06:56	07:39
17-Mar	06:42	18:42	06:54	07:37
18-Mar	06:40	18:44	06:52	07:36
19-Mar	06:37	18:46	06:50	07:34
20-Mar	06:35	18:47	06:49	07:32
21-Mar	06:33	18:49	06:48	07:30
22-Mar	06:31	18:51	06:48	07:28
23-Mar	06:28	18:53	06:47	07:26
24-Mar	06:26	18:54	06:47	07:22
25-Mar	06:24	18:56	06:47	07:17
26-Mar	06:21	18:58	06:47	07:16
27-Mar	06:19	18:59	06:47	07:15
28-Mar	06:17	19:01	06:47	07:14
29-Mar	06:14	19:03	06:48	07:12
30-Mar	06:12	19:05	06:49	07:10
31-Mar	06:10	19:06	06:51	07:07
01-Apr	06:07	19:08	06:54	07:04
05-Apr	05:58	19:15	06:09	06:16
06-Apr	05:56	19:17	06:04	06:21
07-Apr	05:54	19:18	06:01	06:23
08-Apr	05:51	19:20	05:59	06:25
09-Apr	05:49	19:22	05:56	06:26
10-Apr	05:47	19:23	05:54	06:27
11-Apr	05:45	19:25	05:52	06:27
12-Apr	05:42	19:27	05:50	06:28
13-Apr	05:40	19:29	05:49	06:28
14-Apr	05:38	19:30	05:47	06:29
15-Apr	05:36	19:32	05:46	06:29
16-Apr	05:34	19:34	05:45	06:29
17-Apr	05:31	19:35	05:45	06:29
18-Apr	05:29	19:37	05:44	06:28
19-Apr	05:27	19:39	05:44	06:28
20-Apr	05:25	19:41	05:43	06:28
21-Apr	05:23	19:42	05:36	05:42
21-Apr	05:23	19:42	05:43	06:27
22-Apr	05:21	19:44	05:34	06:27
23-Apr	05:19	19:46	05:34	06:26
24-Apr	05:17	19:47	05:33	06:25
25-Apr	05:15	19:49	05:31	06:24
26-Apr	05:13	19:51	05:31	06:23

27-Apr	05:11	19:53	05:27	06:22
28-Apr	05:09	19:54	05:25	06:21
29-Apr	05:07	19:56	05:23	05:25
29-Apr	05:07	19:56	05:24	06:19
30-Apr	05:05	19:58	05:22	06:18
01-May	05:03	19:59	05:22	06:17
02-May	05:01	20:01	05:22	06:15
03-May	04:59	20:03	05:22	06:13
04-May	04:57	20:04	05:22	06:10
05-May	04:55	20:06	05:22	05:53
05-May	04:55	20:06	05:54	06:07
06-May	04:54	20:08	05:23	05:51
07-May	04:52	20:09	05:23	05:50
08-May	04:50	20:11	05:24	05:48
09-May	04:48	20:12	05:25	05:46
10-May	04:47	20:14	05:26	05:44
11-May	04:45	20:16	05:28	05:42
12-May	04:43	20:17	05:31	05:39
31-Jul	04:54	20:25	05:39	05:50
01-Aug	04:56	20:23	05:37	05:53
02-Aug	04:57	20:21	05:36	05:55
03-Aug	04:59	20:19	05:34	05:57
04-Aug	05:00	20:18	05:33	05:58
05-Aug	05:02	20:16	05:32	06:00
06-Aug	05:03	20:14	05:32	06:01
06-Aug	05:03	20:14	06:05	06:14
07-Aug	05:05	20:12	05:31	06:18
08-Aug	05:07	20:10	05:31	06:20
09-Aug	05:08	20:08	05:30	06:22
10-Aug	05:10	20:07	05:30	06:24
11-Aug	05:11	20:05	05:30	06:25
12-Aug	05:13	20:03	05:30	06:26
13-Aug	05:15	20:01	05:32	06:27
14-Aug	05:16	19:59	05:32	06:28
15-Aug	05:18	19:57	05:34	06:29
16-Aug	05:20	19:55	05:37	06:30
17-Aug	05:21	19:52	05:39	06:30
18-Aug	05:23	19:50	05:39	06:31
19-Aug	05:24	19:48	05:39	06:31
20-Aug	05:26	19:46	05:40	06:32
21-Aug	05:28	19:44	05:40	05:45
21-Aug	05:28	19:44	05:47	06:32
22-Aug	05:29	19:42	05:47	06:32
23-Aug	05:31	19:40	05:47	06:32
24-Aug	05:33	19:38	05:47	06:31
25-Aug	05:34	19:35	05:47	06:31
26-Aug	05:36	19:33	05:48	06:31
27-Aug	05:38	19:31	05:48	06:30
28-Aug	05:39	19:29	05:49	06:29
29-Aug	05:41	19:27	05:49	06:29
30-Aug	05:42	19:24	05:50	06:28
31-Aug	05:44	19:22	05:51	06:27
01-Sep	05:46	19:20	05:53	06:25
02-Sep	05:47	19:17	05:55	06:24
03-Sep	05:49	19:15	05:56	06:22
04-Sep	05:51	19:13	05:58	06:20
05-Sep	05:52	19:11	06:00	06:17
06-Sep	05:54	19:08	06:05	06:12
10-Sep	06:00	18:59	06:47	06:57

11-Sep	06:02	18:57	06:43	07:00
12-Sep	06:04	18:54	06:41	07:02
13-Sep	06:05	18:52	06:39	07:03
14-Sep	06:07	18:50	06:38	07:04
15-Sep	06:09	18:47	06:37	07:05
16-Sep	06:10	18:45	06:36	07:05
17-Sep	06:12	18:43	06:35	07:05
18-Sep	06:13	18:40	06:35	07:10
19-Sep	06:15	18:38	06:34	07:13
20-Sep	06:17	18:36	06:34	07:15
21-Sep	06:18	18:33	06:34	07:16
22-Sep	06:20	18:31	06:34	07:17
23-Sep	06:22	18:29	06:35	07:18
24-Sep	06:23	18:26	06:36	07:19
25-Sep	06:25	18:24	06:37	07:20
26-Sep	06:27	18:22	06:38	07:21
27-Sep	06:28	18:19	06:40	07:22
28-Sep	06:30	18:17	06:43	07:23
29-Sep	06:32	18:15	06:46	07:24
30-Sep	06:33	18:12	06:46	07:27
01-Oct	06:35	18:10	06:47	07:29
02-Oct	06:37	18:08	06:48	07:31
03-Oct	06:38	18:05	06:49	07:32
04-Oct	06:40	18:03	06:50	07:33
05-Oct	06:42	18:01	06:52	07:34
06-Oct	06:43	17:58	06:53	07:34
07-Oct	06:45	17:56	06:55	07:35
08-Oct	06:47	17:54	06:56	07:35
09-Oct	06:49	17:52	06:58	07:34
10-Oct	06:50	17:49	07:00	07:34
11-Oct	06:52	17:47	07:04	07:33
12-Oct	06:54	17:45	07:05	07:33
13-Oct	06:55	17:43	07:05	07:32
14-Oct	06:57	17:41	07:06	07:31
15-Oct	06:59	17:38	07:08	07:29
16-Oct	07:01	17:36	07:10	07:28
17-Oct	07:02	17:34	07:19	07:25
16-Nov	07:56	16:40	08:50	08:58
17-Nov	07:58	16:39	08:47	09:01
18-Nov	07:59	16:37	08:46	09:04
19-Nov	08:01	16:36	08:45	09:06
20-Nov	08:03	16:35	08:44	09:10
21-Nov	08:04	16:34	08:44	09:12
22-Nov	08:06	16:33	08:43	09:14
23-Nov	08:08	16:32	08:43	09:15
24-Nov	08:09	16:31	08:43	09:17
25-Nov	08:11	16:30	08:43	09:18
26-Nov	08:13	16:29	08:43	09:19
27-Nov	08:14	16:28	08:43	09:20
28-Nov	08:16	16:27	08:43	09:20
29-Nov	08:17	16:26	08:43	09:21
30-Nov	08:18	16:26	08:43	09:22
01-Dec	08:20	16:25	08:44	09:22
02-Dec	08:21	16:24	08:47	09:23
03-Dec	08:23	16:24	08:48	09:24
03-Dec	08:23	16:24	09:26	09:36
04-Dec	08:24	16:23	08:48	09:24
04-Dec	08:24	16:23	09:25	09:38
05-Dec	08:25	16:23	08:49	09:25

05-Dec	08:25	16:23	09:24	09:40
06-Dec	08:27	16:22	08:49	09:41
07-Dec	08:28	16:22	08:50	09:42
08-Dec	08:29	16:22	08:52	09:43
09-Dec	08:30	16:22	08:53	09:44
10-Dec	08:31	16:22	08:53	09:45
11-Dec	08:32	16:21	08:54	09:46
12-Dec	08:33	16:21	08:56	09:47
13-Dec	08:34	16:21	08:57	09:48
14-Dec	08:35	16:21	08:58	09:49
15-Dec	08:36	16:22	08:59	09:49
16-Dec	08:37	16:22	08:59	09:50
17-Dec	08:37	16:22	09:00	09:51
18-Dec	08:38	16:22	09:00	09:51
19-Dec	08:39	16:23	09:01	09:52
20-Dec	08:39	16:23	09:01	09:52
21-Dec	08:40	16:24	09:02	09:53
22-Dec	08:40	16:24	09:02	09:53
23-Dec	08:41	16:25	09:03	09:54
24-Dec	08:41	16:25	09:03	09:54
25-Dec	08:41	16:26	09:04	09:54
26-Dec	08:42	16:27	09:04	09:55
27-Dec	08:42	16:28	09:05	09:55
28-Dec	08:42	16:29	09:05	09:55
29-Dec	08:42	16:29	09:05	09:56
30-Dec	08:42	16:30	09:05	09:56
31-Dec	08:42	16:31	09:04	09:56

Turbine 13

There are no shadows cast by this turbine at any receptor within the study area

Turbine 14

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
04-Feb	08:10	17:26	16:47	16:55
05-Feb	08:08	17:27	16:43	16:58
06-Feb	08:06	17:29	16:42	17:01
07-Feb	08:05	17:31	16:40	17:03
08-Feb	08:03	17:33	16:39	17:04
09-Feb	08:01	17:35	16:38	17:06
10-Feb	07:59	17:37	16:37	17:07
11-Feb	07:57	17:39	16:37	17:07
12-Feb	07:55	17:41	16:36	17:08
13-Feb	07:54	17:42	16:36	17:08
14-Feb	07:52	17:44	16:36	17:09
15-Feb	07:50	17:46	16:36	17:09
16-Feb	07:48	17:48	16:36	17:09
17-Feb	07:46	17:50	16:36	17:08
18-Feb	07:44	17:52	16:36	17:08
19-Feb	07:42	17:54	16:37	17:08
20-Feb	07:40	17:55	16:37	17:07
21-Feb	07:38	17:57	16:38	17:06
22-Feb	07:36	17:59	16:39	17:05
23-Feb	07:33	18:01	16:41	17:03
24-Feb	07:31	18:03	16:42	17:01
25-Feb	07:29	18:05	16:45	16:59
07-Mar	07:05	18:25	17:42	17:53
08-Mar	07:03	18:26	17:38	17:57

09-Mar	07:00	18:28	17:36	17:59
10-Mar	06:58	18:30	17:34	18:01
11-Mar	06:56	18:32	17:32	18:02
12-Mar	06:54	18:33	17:31	18:05
13-Mar	06:51	18:35	17:30	18:07
14-Mar	06:49	18:37	17:29	18:08
15-Mar	06:47	18:39	17:29	18:10
16-Mar	06:44	18:40	17:28	18:12
17-Mar	06:42	18:42	17:28	18:14
18-Mar	06:40	18:44	17:27	18:16
19-Mar	06:37	18:46	17:27	18:18
20-Mar	06:35	18:47	17:27	18:20
21-Mar	06:33	18:49	17:28	18:21
22-Mar	06:31	18:51	17:28	18:23
23-Mar	06:28	18:53	17:29	18:25
24-Mar	06:26	18:54	17:29	18:29
25-Mar	06:24	18:56	17:30	18:31
26-Mar	06:21	18:58	17:31	18:33
27-Mar	06:19	18:59	17:32	18:34
28-Mar	06:17	19:01	17:34	18:35
29-Mar	06:14	19:03	17:36	18:36
30-Mar	06:12	19:05	17:40	18:36
31-Mar	06:10	19:06	17:46	18:36
01-Apr	06:07	19:08	17:49	18:38
02-Apr	06:05	19:10	17:51	18:42
03-Apr	06:03	19:11	17:54	18:44
04-Apr	06:00	19:13	17:56	18:46
05-Apr	05:58	19:15	17:59	18:47
06-Apr	05:56	19:17	18:00	18:48
07-Apr	05:54	19:18	18:01	18:59
08-Apr	05:51	19:20	18:03	19:01
09-Apr	05:49	19:22	18:05	19:02
10-Apr	05:47	19:23	18:09	19:04
11-Apr	05:45	19:25	18:14	19:05
12-Apr	05:42	19:27	18:14	19:06
13-Apr	05:40	19:29	18:14	19:07
14-Apr	05:38	19:30	18:14	19:07
15-Apr	05:36	19:32	18:14	19:07
16-Apr	05:34	19:34	18:14	19:08
17-Apr	05:31	19:35	18:14	19:07
18-Apr	05:29	19:37	18:15	19:07
19-Apr	05:27	19:39	18:15	19:07
20-Apr	05:25	19:41	18:16	19:06
21-Apr	05:23	19:42	18:18	19:06
22-Apr	05:21	19:44	18:19	19:05
23-Apr	05:19	19:46	18:21	18:39
23-Apr	05:19	19:46	18:39	19:04
24-Apr	05:17	19:47	18:24	18:36
24-Apr	05:17	19:47	18:40	19:03
25-Apr	05:15	19:49	18:41	19:01
26-Apr	05:13	19:51	18:43	18:59
27-Apr	05:11	19:53	18:45	18:57
13-Aug	05:15	20:01	18:55	19:02
14-Aug	05:16	19:59	18:51	19:05
15-Aug	05:18	19:57	18:49	19:07
16-Aug	05:20	19:55	18:33	18:39
16-Aug	05:20	19:55	18:47	19:08
17-Aug	05:21	19:52	18:29	18:43
17-Aug	05:21	19:52	18:46	19:09

18-Aug	05:23	19:50	18:26	19:10
19-Aug	05:24	19:48	18:24	19:10
20-Aug	05:26	19:46	18:22	19:11
21-Aug	05:28	19:44	18:20	19:11
22-Aug	05:29	19:42	18:19	19:11
23-Aug	05:31	19:40	18:18	19:10
24-Aug	05:33	19:38	18:17	19:10
25-Aug	05:34	19:35	18:16	19:10
26-Aug	05:36	19:33	18:15	19:09
27-Aug	05:38	19:31	18:15	19:08
28-Aug	05:39	19:29	18:14	19:07
29-Aug	05:41	19:27	18:14	19:06
30-Aug	05:42	19:24	18:14	19:05
31-Aug	05:44	19:22	18:07	19:03
01-Sep	05:46	19:20	18:03	19:00
02-Sep	05:47	19:17	18:00	18:58
03-Sep	05:49	19:15	17:58	18:55
04-Sep	05:51	19:13	17:57	18:45
05-Sep	05:52	19:11	17:54	18:43
06-Sep	05:54	19:08	17:51	18:41
07-Sep	05:55	19:06	17:49	18:39
08-Sep	05:57	19:04	17:45	18:36
09-Sep	05:59	19:01	17:43	18:32
10-Sep	06:00	18:59	17:39	18:29
11-Sep	06:02	18:57	17:32	18:28
12-Sep	06:04	18:54	17:28	18:27
13-Sep	06:05	18:52	17:25	18:26
14-Sep	06:07	18:50	17:22	18:24
15-Sep	06:09	18:47	17:21	18:22
16-Sep	06:10	18:45	17:19	18:20
17-Sep	06:12	18:43	17:18	18:17
18-Sep	06:13	18:40	17:16	18:13
19-Sep	06:15	18:38	17:15	18:10
20-Sep	06:17	18:36	17:14	18:08
21-Sep	06:18	18:33	17:13	18:06
22-Sep	06:20	18:31	17:12	18:03
23-Sep	06:22	18:29	17:12	18:01
24-Sep	06:23	18:26	17:11	17:59
25-Sep	06:25	18:24	17:11	17:56
26-Sep	06:27	18:22	17:11	17:53
27-Sep	06:28	18:19	17:11	17:51
28-Sep	06:30	18:17	17:11	17:49
29-Sep	06:32	18:15	17:11	17:46
30-Sep	06:33	18:12	17:12	17:43
01-Oct	06:35	18:10	17:13	17:41
02-Oct	06:37	18:08	17:14	17:38
03-Oct	06:38	18:05	17:15	17:36
04-Oct	06:40	18:03	17:18	17:33
15-Oct	06:59	17:38	16:21	16:28
16-Oct	07:01	17:36	16:16	16:32
17-Oct	07:02	17:34	16:14	16:34
18-Oct	07:04	17:32	16:12	16:35
19-Oct	07:06	17:30	16:10	16:36
20-Oct	07:08	17:28	16:09	16:37
21-Oct	07:09	17:26	16:08	16:38
22-Oct	07:11	17:24	16:07	16:38
23-Oct	07:13	17:22	16:07	16:38
24-Oct	07:15	17:19	16:06	16:39
25-Oct	07:17	17:17	16:06	16:39

26-Oct	07:18	17:15	16:06	16:38
27-Oct	07:20	17:14	16:06	16:38
28-Oct	07:22	17:12	16:06	16:38
29-Oct	07:24	17:10	16:06	16:37
30-Oct	07:26	17:08	16:06	16:37
31-Oct	07:27	17:06	16:07	16:36
01-Nov	07:29	17:04	16:08	16:35
02-Nov	07:31	17:02	16:08	16:34
03-Nov	07:33	17:00	16:10	16:32
04-Nov	07:35	16:59	16:11	16:30
05-Nov	07:36	16:57	16:13	16:28
06-Nov	07:38	16:55	16:16	16:25

Turbine 15

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	14:45	15:16
02-Jan	08:42	16:33	14:46	15:16
03-Jan	08:42	16:34	08:59	09:06
03-Jan	08:42	16:34	14:47	15:16
04-Jan	08:41	16:35	08:58	09:08
04-Jan	08:41	16:35	14:48	15:20
05-Jan	08:41	16:36	08:57	09:09
05-Jan	08:41	16:36	14:49	15:21
06-Jan	08:41	16:38	08:57	09:11
06-Jan	08:41	16:38	14:50	15:21
07-Jan	08:40	16:39	08:56	09:12
07-Jan	08:40	16:39	14:51	15:20
08-Jan	08:40	16:40	08:56	09:13
08-Jan	08:40	16:40	14:52	15:20
09-Jan	08:39	16:42	08:55	09:14
09-Jan	08:39	16:42	14:53	15:20
10-Jan	08:39	16:43	08:55	09:15
10-Jan	08:39	16:43	14:55	15:20
11-Jan	08:38	16:44	08:54	09:16
11-Jan	08:38	16:44	14:56	15:19
12-Jan	08:38	16:46	08:54	09:17
12-Jan	08:38	16:46	14:58	15:18
13-Jan	08:37	16:47	08:53	09:18
13-Jan	08:37	16:47	14:59	15:17
14-Jan	08:36	16:49	08:53	09:19
14-Jan	08:36	16:49	15:01	15:16
15-Jan	08:35	16:50	08:53	09:20
15-Jan	08:35	16:50	15:04	15:14
16-Jan	08:34	16:52	08:53	09:21
17-Jan	08:33	16:54	08:53	09:21
18-Jan	08:33	16:55	08:53	09:22
19-Jan	08:32	16:57	08:53	09:22
20-Jan	08:30	16:59	08:53	09:23
21-Jan	08:29	17:00	08:53	09:23
22-Jan	08:28	17:02	08:53	09:24
23-Jan	08:27	17:04	08:53	09:24
24-Jan	08:26	17:06	08:53	09:24
25-Jan	08:24	17:07	08:54	09:24
26-Jan	08:23	17:09	08:54	09:24
27-Jan	08:22	17:11	08:55	09:24
28-Jan	08:20	17:13	08:55	09:24
29-Jan	08:19	17:15	08:56	09:23
30-Jan	08:17	17:16	08:57	09:23
31-Jan	08:16	17:18	08:57	09:22

01-Feb	08:14	17:20	08:59	09:21
02-Feb	08:13	17:22	09:00	09:20
03-Feb	08:11	17:24	09:02	09:17
04-Feb	08:10	17:26	09:04	09:15
06-Nov	07:38	16:55	08:38	08:41
07-Nov	07:40	16:54	08:33	08:46
08-Nov	07:42	16:52	08:31	08:48
09-Nov	07:44	16:50	08:30	08:50
10-Nov	07:45	16:49	08:29	08:52
11-Nov	07:47	16:47	08:28	08:53
12-Nov	07:49	16:46	08:27	08:54
13-Nov	07:51	16:44	08:27	08:55
14-Nov	07:52	16:43	08:27	08:56
15-Nov	07:54	16:41	08:26	08:56
16-Nov	07:56	16:40	08:26	08:57
17-Nov	07:58	16:39	08:27	08:57
18-Nov	07:59	16:37	08:27	08:57
19-Nov	08:01	16:36	08:27	08:58
20-Nov	08:03	16:35	08:27	08:58
21-Nov	08:04	16:34	08:28	08:58
22-Nov	08:06	16:33	08:28	08:58
23-Nov	08:08	16:32	08:29	08:58
24-Nov	08:09	16:31	08:29	08:58
25-Nov	08:11	16:30	08:30	08:58
26-Nov	08:13	16:29	08:31	08:58
26-Nov	08:13	16:29	14:44	14:51
27-Nov	08:14	16:28	08:32	08:58
27-Nov	08:14	16:28	14:41	14:54
28-Nov	08:16	16:27	08:33	08:58
28-Nov	08:16	16:27	14:39	14:57
29-Nov	08:17	16:26	08:34	08:58
29-Nov	08:17	16:26	14:38	14:58
30-Nov	08:18	16:26	08:35	08:58
30-Nov	08:18	16:26	14:38	15:00
01-Dec	08:20	16:25	08:36	08:58
01-Dec	08:20	16:25	14:37	15:01
02-Dec	08:21	16:24	08:37	08:58
02-Dec	08:21	16:24	14:36	15:02
03-Dec	08:23	16:24	08:38	08:57
03-Dec	08:23	16:24	14:36	15:04
04-Dec	08:24	16:23	08:40	08:57
04-Dec	08:24	16:23	14:35	15:05
05-Dec	08:25	16:23	08:41	08:57
05-Dec	08:25	16:23	14:35	15:06
06-Dec	08:27	16:22	08:42	08:56
06-Dec	08:27	16:22	14:35	15:06
07-Dec	08:28	16:22	08:44	08:56
07-Dec	08:28	16:22	14:35	15:07
08-Dec	08:29	16:22	08:46	08:55
08-Dec	08:29	16:22	14:35	15:08
09-Dec	08:30	16:22	08:48	08:53
09-Dec	08:30	16:22	14:35	15:05
10-Dec	08:31	16:22	14:35	15:06
11-Dec	08:32	16:21	14:35	15:06
12-Dec	08:33	16:21	14:35	15:07
13-Dec	08:34	16:21	14:36	15:08
14-Dec	08:35	16:21	14:36	15:08
15-Dec	08:36	16:22	14:36	15:09
16-Dec	08:37	16:22	14:37	15:09

17-Dec	08:37	16:22	14:37	15:10
18-Dec	08:38	16:22	14:37	15:11
19-Dec	08:39	16:23	14:38	15:11
20-Dec	08:39	16:23	14:38	15:12
21-Dec	08:40	16:24	14:39	15:12
22-Dec	08:40	16:24	14:39	15:13
23-Dec	08:41	16:25	14:40	15:13
24-Dec	08:41	16:25	14:40	15:14
25-Dec	08:41	16:26	14:41	15:14
26-Dec	08:42	16:27	14:42	15:14
27-Dec	08:42	16:28	14:42	15:15
28-Dec	08:42	16:29	14:43	15:15
29-Dec	08:42	16:29	14:44	15:15
30-Dec	08:42	16:30	14:44	15:16
31-Dec	08:42	16:31	14:45	15:16

Turbine 16

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
24-Mar	06:26	18:54	18:25	18:34
25-Mar	06:24	18:56	18:20	18:37
26-Mar	06:21	18:58	18:18	18:40
27-Mar	06:19	18:59	18:16	18:42
28-Mar	06:17	19:01	18:14	18:43
29-Mar	06:14	19:03	18:13	18:44
30-Mar	06:12	19:05	18:12	18:45
31-Mar	06:10	19:06	18:11	18:45
01-Apr	06:07	19:08	18:10	18:45
02-Apr	06:05	19:10	18:09	18:45
03-Apr	06:03	19:11	18:09	18:45
04-Apr	06:00	19:13	18:09	18:45
05-Apr	05:58	19:15	18:08	18:45
06-Apr	05:56	19:17	18:08	18:45
07-Apr	05:54	19:18	18:09	18:44
08-Apr	05:51	19:20	18:09	18:43
09-Apr	05:49	19:22	18:09	18:42
10-Apr	05:47	19:23	18:10	18:41
11-Apr	05:45	19:25	18:10	18:40
12-Apr	05:42	19:27	18:11	18:39
13-Apr	05:40	19:29	18:13	18:37
14-Apr	05:38	19:30	18:14	18:35
15-Apr	05:36	19:32	18:17	18:32
06-May	04:54	20:08	19:26	19:39
07-May	04:52	20:09	19:24	19:41
08-May	04:50	20:11	19:21	19:43
09-May	04:48	20:12	19:20	19:45
10-May	04:47	20:14	19:19	19:46
11-May	04:45	20:16	19:18	19:47
12-May	04:43	20:17	19:17	19:49
13-May	04:42	20:19	19:16	19:50
14-May	04:40	20:20	19:15	19:51
15-May	04:39	20:22	19:15	19:52
16-May	04:37	20:23	19:14	19:52
17-May	04:36	20:25	19:14	19:53
18-May	04:34	20:26	19:14	19:54
19-May	04:33	20:28	19:13	19:54
20-May	04:32	20:29	19:13	19:54
21-May	04:30	20:31	19:13	19:55
22-May	04:29	20:32	19:13	19:55
23-May	04:28	20:34	19:13	19:56

24-May	04:27	20:35	19:13	19:56
25-May	04:25	20:36	19:13	19:56
26-May	04:24	20:38	19:13	19:56
27-May	04:23	20:39	19:13	19:57
28-May	04:22	20:40	19:14	19:57
29-May	04:21	20:41	19:14	19:57
30-May	04:20	20:42	19:14	19:57
31-May	04:20	20:44	19:14	19:57
01-Jun	04:19	20:45	19:15	19:57
02-Jun	04:18	20:46	19:15	19:58
03-Jun	04:17	20:47	19:15	19:58
04-Jun	04:16	20:48	19:15	19:58
05-Jun	04:16	20:49	19:16	19:58
06-Jun	04:15	20:50	19:16	19:58
07-Jun	04:15	20:50	19:16	19:58
08-Jun	04:14	20:51	19:17	19:58
09-Jun	04:14	20:52	19:17	19:58
10-Jun	04:13	20:53	19:17	19:58
11-Jun	04:13	20:54	19:18	19:59
12-Jun	04:13	20:54	19:18	19:59
13-Jun	04:13	20:55	19:18	19:59
14-Jun	04:13	20:55	19:19	19:59
15-Jun	04:12	20:56	19:19	19:59
16-Jun	04:12	20:56	19:19	19:59
17-Jun	04:12	20:57	19:19	20:00
18-Jun	04:12	20:57	19:20	20:00
19-Jun	04:13	20:57	19:20	20:00
20-Jun	04:13	20:58	19:20	20:00
21-Jun	04:13	20:58	19:20	20:00
22-Jun	04:13	20:58	19:21	20:01
23-Jun	04:13	20:58	19:21	20:01
24-Jun	04:14	20:58	19:21	20:01
25-Jun	04:14	20:58	19:21	20:01
26-Jun	04:15	20:58	19:21	20:02
27-Jun	04:15	20:58	19:21	20:02
28-Jun	04:16	20:58	19:21	20:02
29-Jun	04:16	20:57	19:22	20:02
30-Jun	04:17	20:57	19:22	20:03
01-Jul	04:18	20:57	19:22	20:03
02-Jul	04:18	20:56	19:22	20:03
03-Jul	04:19	20:56	19:22	20:03
04-Jul	04:20	20:55	19:22	20:04
05-Jul	04:21	20:55	19:22	20:04
06-Jul	04:22	20:54	19:22	20:04
07-Jul	04:23	20:54	19:22	20:04
08-Jul	04:24	20:53	19:22	20:05
09-Jul	04:25	20:52	19:22	20:05
10-Jul	04:26	20:51	19:22	20:05
11-Jul	04:27	20:50	19:22	20:05
12-Jul	04:28	20:50	19:22	20:05
13-Jul	04:29	20:49	19:22	20:05
14-Jul	04:30	20:48	19:22	20:05
15-Jul	04:32	20:47	19:22	20:05
16-Jul	04:33	20:46	19:22	20:05
17-Jul	04:34	20:44	19:22	20:05
18-Jul	04:35	20:43	19:23	20:05
19-Jul	04:37	20:42	19:23	20:05
20-Jul	04:38	20:41	19:23	20:05
21-Jul	04:39	20:40	19:23	20:04

22-Jul	04:41	20:38	19:23	20:04
23-Jul	04:42	20:37	19:24	20:04
24-Jul	04:44	20:35	19:24	20:03
25-Jul	04:45	20:34	19:24	20:03
26-Jul	04:46	20:32	19:25	20:02
27-Jul	04:48	20:31	19:25	20:01
28-Jul	04:49	20:29	19:26	20:00
29-Jul	04:51	20:28	19:27	19:59
30-Jul	04:52	20:26	19:27	19:58
31-Jul	04:54	20:25	19:28	19:57
01-Aug	04:56	20:23	19:29	19:55
02-Aug	04:57	20:21	19:31	19:54
03-Aug	04:59	20:19	19:32	19:52
04-Aug	05:00	20:18	19:34	19:49
05-Aug	05:02	20:16	19:39	19:45
25-Aug	05:34	19:35	18:23	18:30
26-Aug	05:36	19:33	18:18	18:34
27-Aug	05:38	19:31	18:15	18:37
28-Aug	05:39	19:29	18:13	18:38
29-Aug	05:41	19:27	18:11	18:39
30-Aug	05:42	19:24	18:10	18:40
31-Aug	05:44	19:22	18:09	18:40
01-Sep	05:46	19:20	18:07	18:41
02-Sep	05:47	19:17	18:07	18:41
03-Sep	05:49	19:15	18:06	18:41
04-Sep	05:51	19:13	18:05	18:41
05-Sep	05:52	19:11	18:04	18:41
06-Sep	05:54	19:08	18:04	18:41
07-Sep	05:55	19:06	18:04	18:40
08-Sep	05:57	19:04	18:03	18:40
09-Sep	05:59	19:01	18:03	18:39
10-Sep	06:00	18:59	18:03	18:38
11-Sep	06:02	18:57	18:04	18:37
12-Sep	06:04	18:54	18:04	18:35
13-Sep	06:05	18:52	18:05	18:34
14-Sep	06:07	18:50	18:06	18:32
15-Sep	06:09	18:47	18:07	18:29
16-Sep	06:10	18:45	18:09	18:27
17-Sep	06:12	18:43	18:12	18:23

Turbine 17

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	08:58	09:31
02-Jan	08:42	16:33	08:58	09:32
03-Jan	08:42	16:34	08:59	09:32
04-Jan	08:41	16:35	08:59	09:33
05-Jan	08:41	16:36	08:59	09:33
06-Jan	08:41	16:38	09:00	09:34
07-Jan	08:40	16:39	09:00	09:34
08-Jan	08:40	16:40	09:01	09:34
09-Jan	08:39	16:42	09:01	09:35
10-Jan	08:39	16:43	09:02	09:35
11-Jan	08:38	16:44	09:02	09:35
12-Jan	08:38	16:46	09:03	09:36
13-Jan	08:37	16:47	09:03	09:36
14-Jan	08:36	16:49	09:04	09:36
15-Jan	08:35	16:50	09:04	09:39
16-Jan	08:34	16:52	09:05	09:40
17-Jan	08:33	16:54	09:05	09:40

18-Jan	08:33	16:55	09:06	09:40
19-Jan	08:32	16:57	09:07	09:39
20-Jan	08:30	16:59	09:08	09:39
21-Jan	08:29	17:00	09:09	09:39
22-Jan	08:28	17:02	09:10	09:38
23-Jan	08:27	17:04	09:11	09:37
24-Jan	08:26	17:06	09:12	09:37
25-Jan	08:24	17:07	09:14	09:35
26-Jan	08:23	17:09	09:16	09:34
27-Jan	08:22	17:11	09:18	09:31
24-Feb	07:31	18:03	07:45	08:00
25-Feb	07:29	18:05	07:41	08:03
26-Feb	07:27	18:07	07:39	08:06
27-Feb	07:25	18:08	07:37	08:07
28-Feb	07:23	18:10	07:34	08:09
29-Feb	07:21	18:12	07:32	08:10
01-Mar	07:18	18:14	07:31	08:10
02-Mar	07:16	18:16	07:29	08:11
03-Mar	07:14	18:17	07:28	08:12
04-Mar	07:12	18:19	07:27	08:12
05-Mar	07:10	18:21	07:23	08:12
06-Mar	07:07	18:23	07:20	08:12
07-Mar	07:05	18:25	07:18	08:12
08-Mar	07:03	18:26	07:16	08:12
09-Mar	07:00	18:28	07:15	08:12
10-Mar	06:58	18:30	07:14	08:12
11-Mar	06:56	18:32	07:13	08:11
12-Mar	06:54	18:33	07:12	08:10
13-Mar	06:51	18:35	07:11	08:10
14-Mar	06:49	18:37	07:11	08:09
15-Mar	06:47	18:39	07:11	08:08
16-Mar	06:44	18:40	07:11	08:06
17-Mar	06:42	18:42	07:11	08:05
18-Mar	06:40	18:44	07:11	08:03
19-Mar	06:37	18:46	07:12	08:01
20-Mar	06:35	18:47	07:13	07:59
21-Mar	06:33	18:49	07:14	07:57
22-Mar	06:31	18:51	07:16	07:33
22-Mar	06:31	18:51	07:32	07:54
23-Mar	06:28	18:53	07:19	07:30
23-Mar	06:28	18:53	07:36	07:50
24-Apr	05:17	19:47	19:17	19:33
25-Apr	05:15	19:49	19:14	19:36
26-Apr	05:13	19:51	19:12	19:38
27-Apr	05:11	19:53	19:10	19:39
28-Apr	05:09	19:54	19:08	19:41
29-Apr	05:07	19:56	19:07	19:42
30-Apr	05:05	19:58	19:06	19:44
01-May	05:03	19:59	19:05	19:45
02-May	05:01	20:01	19:04	19:47
03-May	04:59	20:03	19:03	19:48
04-May	04:57	20:04	19:02	19:49
05-May	04:55	20:06	19:02	19:49
06-May	04:54	20:08	19:01	19:50
07-May	04:52	20:09	19:01	19:51
08-May	04:50	20:11	19:01	19:51
09-May	04:48	20:12	19:00	19:52
10-May	04:47	20:14	19:00	19:52
11-May	04:45	20:16	19:00	19:52

12-May	04:43	20:17	19:00	19:52
13-May	04:42	20:19	19:00	19:53
14-May	04:40	20:20	19:00	19:53
15-May	04:39	20:22	19:00	19:53
16-May	04:37	20:23	05:07	05:19
16-May	04:37	20:23	19:00	19:53
17-May	04:36	20:25	05:04	05:22
17-May	04:36	20:25	19:01	19:53
18-May	04:34	20:26	05:02	05:24
18-May	04:34	20:26	19:01	19:53
19-May	04:33	20:28	05:01	05:25
19-May	04:33	20:28	19:01	19:53
20-May	04:32	20:29	05:00	05:26
20-May	04:32	20:29	19:01	19:53
21-May	04:30	20:31	04:58	05:27
21-May	04:30	20:31	19:02	19:53
22-May	04:29	20:32	04:57	05:28
22-May	04:29	20:32	19:02	19:53
23-May	04:28	20:34	04:56	05:29
23-May	04:28	20:34	19:03	19:53
24-May	04:27	20:35	04:55	05:30
24-May	04:27	20:35	19:03	19:53
25-May	04:25	20:36	04:55	05:31
25-May	04:25	20:36	19:04	19:53
26-May	04:24	20:38	04:54	05:31
26-May	04:24	20:38	19:04	19:53
27-May	04:23	20:39	04:53	05:32
27-May	04:23	20:39	19:05	19:53
28-May	04:22	20:40	04:53	05:32
28-May	04:22	20:40	19:05	19:52
29-May	04:21	20:41	04:53	05:33
29-May	04:21	20:41	19:06	19:52
30-May	04:20	20:42	04:52	05:33
30-May	04:20	20:42	19:07	19:52
31-May	04:20	20:44	04:52	05:34
31-May	04:20	20:44	19:07	19:52
01-Jun	04:19	20:45	04:51	05:34
01-Jun	04:19	20:45	19:08	19:52
02-Jun	04:18	20:46	04:50	05:35
02-Jun	04:18	20:46	19:09	19:52
03-Jun	04:17	20:47	04:41	04:46
03-Jun	04:17	20:47	04:49	05:35
03-Jun	04:17	20:47	19:09	19:51
04-Jun	04:16	20:48	04:39	04:48
04-Jun	04:16	20:48	04:49	05:35
04-Jun	04:16	20:48	19:10	19:51
05-Jun	04:16	20:49	04:37	05:36
05-Jun	04:16	20:49	19:10	19:51
06-Jun	04:15	20:50	04:37	05:36
06-Jun	04:15	20:50	19:11	19:51
07-Jun	04:15	20:50	04:36	05:36
07-Jun	04:15	20:50	19:11	19:51
08-Jun	04:14	20:51	04:36	05:37
08-Jun	04:14	20:51	19:12	19:51
09-Jun	04:14	20:52	04:35	05:37
09-Jun	04:14	20:52	19:12	19:51
10-Jun	04:13	20:53	04:35	05:37
10-Jun	04:13	20:53	19:13	19:51
11-Jun	04:13	20:54	04:35	05:37

11-Jun	04:13	20:54	19:13	19:51
12-Jun	04:13	20:54	04:34	05:38
12-Jun	04:13	20:54	19:13	19:51
13-Jun	04:13	20:55	04:34	05:38
13-Jun	04:13	20:55	19:14	19:51
14-Jun	04:13	20:55	04:34	05:38
14-Jun	04:13	20:55	19:14	19:51
15-Jun	04:12	20:56	04:34	05:38
15-Jun	04:12	20:56	19:15	19:51
16-Jun	04:12	20:56	04:34	05:39
16-Jun	04:12	20:56	19:15	19:51
17-Jun	04:12	20:57	04:34	05:39
17-Jun	04:12	20:57	19:15	19:51
18-Jun	04:12	20:57	04:34	05:39
18-Jun	04:12	20:57	19:16	19:51
19-Jun	04:13	20:57	04:34	05:39
19-Jun	04:13	20:57	19:16	19:51
20-Jun	04:13	20:58	04:34	05:40
20-Jun	04:13	20:58	19:16	19:51
21-Jun	04:13	20:58	04:35	05:40
21-Jun	04:13	20:58	19:16	19:52
22-Jun	04:13	20:58	04:35	05:40
22-Jun	04:13	20:58	19:16	19:52
23-Jun	04:13	20:58	04:35	05:40
23-Jun	04:13	20:58	19:17	19:52
24-Jun	04:14	20:58	04:35	05:40
24-Jun	04:14	20:58	19:17	19:53
25-Jun	04:14	20:58	04:36	05:41
25-Jun	04:14	20:58	19:17	19:53
26-Jun	04:15	20:58	04:36	05:41
26-Jun	04:15	20:58	19:17	19:53
27-Jun	04:15	20:58	04:37	05:41
27-Jun	04:15	20:58	19:17	19:54
28-Jun	04:16	20:58	04:37	05:41
28-Jun	04:16	20:58	19:17	19:54
29-Jun	04:16	20:57	04:38	05:41
29-Jun	04:16	20:57	19:17	19:54
30-Jun	04:17	20:57	04:38	05:41
30-Jun	04:17	20:57	19:17	19:55
01-Jul	04:18	20:57	04:39	05:42
01-Jul	04:18	20:57	19:17	19:55
02-Jul	04:18	20:56	04:40	05:42
02-Jul	04:18	20:56	19:17	19:56
03-Jul	04:19	20:56	04:40	05:42
03-Jul	04:19	20:56	19:17	19:56
04-Jul	04:20	20:55	04:41	05:42
04-Jul	04:20	20:55	19:16	19:57
05-Jul	04:21	20:55	04:42	05:42
05-Jul	04:21	20:55	19:16	19:57
06-Jul	04:22	20:54	04:43	05:42
06-Jul	04:22	20:54	19:16	19:58
07-Jul	04:23	20:54	04:45	04:55
07-Jul	04:23	20:54	04:55	05:42
07-Jul	04:23	20:54	19:16	19:58
08-Jul	04:24	20:53	04:47	04:54
08-Jul	04:24	20:53	04:56	05:42
08-Jul	04:24	20:53	19:16	19:59
09-Jul	04:25	20:52	04:57	05:42
09-Jul	04:25	20:52	19:15	19:59

10-Jul	04:26	20:51	04:58	05:42
10-Jul	04:26	20:51	19:15	20:00
11-Jul	04:27	20:50	04:59	05:42
11-Jul	04:27	20:50	19:15	20:00
12-Jul	04:28	20:50	05:00	05:42
12-Jul	04:28	20:50	19:14	20:00
13-Jul	04:29	20:49	05:01	05:41
13-Jul	04:29	20:49	19:14	20:01
14-Jul	04:30	20:48	05:01	05:41
14-Jul	04:30	20:48	19:14	20:01
15-Jul	04:32	20:47	05:02	05:41
15-Jul	04:32	20:47	19:13	20:02
16-Jul	04:33	20:46	05:03	05:41
16-Jul	04:33	20:46	19:13	20:02
17-Jul	04:34	20:44	05:03	05:40
17-Jul	04:34	20:44	19:13	20:02
18-Jul	04:35	20:43	05:04	05:40
18-Jul	04:35	20:43	19:12	20:02
19-Jul	04:37	20:42	05:05	05:39
19-Jul	04:37	20:42	19:12	20:03
20-Jul	04:38	20:41	05:06	05:38
20-Jul	04:38	20:41	19:12	20:03
21-Jul	04:39	20:40	05:07	05:38
21-Jul	04:39	20:40	19:11	20:03
22-Jul	04:41	20:38	05:09	05:37
22-Jul	04:41	20:38	19:11	20:03
23-Jul	04:42	20:37	05:10	05:36
23-Jul	04:42	20:37	19:11	20:03
24-Jul	04:44	20:35	05:11	05:34
24-Jul	04:44	20:35	19:11	20:03
25-Jul	04:45	20:34	05:13	05:33
25-Jul	04:45	20:34	19:11	20:03
26-Jul	04:46	20:32	05:15	05:31
26-Jul	04:46	20:32	19:10	20:03
27-Jul	04:48	20:31	05:19	05:27
27-Jul	04:48	20:31	19:10	20:03
28-Jul	04:49	20:29	19:10	20:03
29-Jul	04:51	20:28	19:10	20:03
30-Jul	04:52	20:26	19:10	20:02
31-Jul	04:54	20:25	19:10	20:02
01-Aug	04:56	20:23	19:10	20:02
02-Aug	04:57	20:21	19:10	20:01
03-Aug	04:59	20:19	19:11	20:00
04-Aug	05:00	20:18	19:11	20:00
05-Aug	05:02	20:16	19:11	19:59
06-Aug	05:03	20:14	19:11	19:58
07-Aug	05:05	20:12	19:12	19:57
08-Aug	05:07	20:10	19:12	19:56
09-Aug	05:08	20:08	19:13	19:54
10-Aug	05:10	20:07	19:13	19:53
11-Aug	05:11	20:05	19:14	19:51
12-Aug	05:13	20:03	19:15	19:49
13-Aug	05:15	20:01	19:16	19:47
14-Aug	05:16	19:59	19:17	19:46
15-Aug	05:18	19:57	19:19	19:43
16-Aug	05:20	19:55	19:21	19:41
17-Aug	05:21	19:52	19:25	19:36
19-Sep	06:15	18:38	07:06	07:17
19-Sep	06:15	18:38	07:23	07:37

20-Sep	06:17	18:36	07:03	07:20
20-Sep	06:17	18:36	07:19	07:40
21-Sep	06:18	18:33	07:00	07:42
22-Sep	06:20	18:31	06:58	07:44
23-Sep	06:22	18:29	06:57	07:46
24-Sep	06:23	18:26	06:55	07:47
25-Sep	06:25	18:24	06:54	07:48
26-Sep	06:27	18:22	06:54	07:49
27-Sep	06:28	18:19	06:53	07:50
28-Sep	06:30	18:17	06:53	07:50
29-Sep	06:32	18:15	06:52	07:50
30-Sep	06:33	18:12	06:52	07:51
01-Oct	06:35	18:10	06:52	07:51
02-Oct	06:37	18:08	06:53	07:51
03-Oct	06:38	18:05	06:53	07:50
04-Oct	06:40	18:03	06:54	07:50
05-Oct	06:42	18:01	06:55	07:50
06-Oct	06:43	17:58	06:57	07:49
07-Oct	06:45	17:56	06:59	07:49
08-Oct	06:47	17:54	07:03	07:48
09-Oct	06:49	17:52	07:03	07:47
10-Oct	06:50	17:49	07:04	07:46
11-Oct	06:52	17:47	07:05	07:45
12-Oct	06:54	17:45	07:06	07:44
13-Oct	06:55	17:43	07:07	07:43
14-Oct	06:57	17:41	07:09	07:41
15-Oct	06:59	17:38	07:11	07:39
16-Oct	07:01	17:36	07:13	07:37
17-Oct	07:02	17:34	07:15	07:34
18-Oct	07:04	17:32	07:19	07:29
14-Nov	07:52	16:43	08:53	09:00
15-Nov	07:54	16:41	08:49	09:04
16-Nov	07:56	16:40	08:48	09:07
17-Nov	07:58	16:39	08:46	09:09
18-Nov	07:59	16:37	08:45	09:10
19-Nov	08:01	16:36	08:44	09:12
20-Nov	08:03	16:35	08:44	09:13
21-Nov	08:04	16:34	08:43	09:14
22-Nov	08:06	16:33	08:43	09:15
23-Nov	08:08	16:32	08:43	09:16
24-Nov	08:09	16:31	08:43	09:16
25-Nov	08:11	16:30	08:43	09:17
26-Nov	08:13	16:29	08:43	09:18
27-Nov	08:14	16:28	08:43	09:15
28-Nov	08:16	16:27	08:43	09:15
29-Nov	08:17	16:26	08:43	09:16
30-Nov	08:18	16:26	08:43	09:16
01-Dec	08:20	16:25	08:44	09:17
02-Dec	08:21	16:24	08:44	09:17
03-Dec	08:23	16:24	08:44	09:18
04-Dec	08:24	16:23	08:45	09:18
05-Dec	08:25	16:23	08:45	09:19
06-Dec	08:27	16:22	08:46	09:19
07-Dec	08:28	16:22	08:46	09:20
08-Dec	08:29	16:22	08:46	09:20
09-Dec	08:30	16:22	08:47	09:20
10-Dec	08:31	16:22	08:47	09:21
11-Dec	08:32	16:21	08:48	09:21
12-Dec	08:33	16:21	08:49	09:22

13-Dec	08:34	16:21	08:49	09:22
14-Dec	08:35	16:21	08:50	09:23
14-Dec	08:35	16:21	10:06	10:13
15-Dec	08:36	16:22	08:50	09:23
15-Dec	08:36	16:22	10:05	10:15
16-Dec	08:37	16:22	08:51	09:24
16-Dec	08:37	16:22	10:04	10:16
17-Dec	08:37	16:22	08:51	09:24
17-Dec	08:37	16:22	10:04	10:17
18-Dec	08:38	16:22	08:52	09:24
18-Dec	08:38	16:22	10:04	10:18
19-Dec	08:39	16:23	08:52	09:25
19-Dec	08:39	16:23	10:04	10:19
20-Dec	08:39	16:23	08:53	09:25
20-Dec	08:39	16:23	10:05	10:19
21-Dec	08:40	16:24	08:53	09:26
21-Dec	08:40	16:24	10:05	10:20
22-Dec	08:40	16:24	08:54	09:26
22-Dec	08:40	16:24	10:06	10:20
23-Dec	08:41	16:25	08:54	09:27
23-Dec	08:41	16:25	10:06	10:21
24-Dec	08:41	16:25	08:55	09:27
24-Dec	08:41	16:25	10:07	10:21
25-Dec	08:41	16:26	08:55	09:28
25-Dec	08:41	16:26	10:08	10:21
26-Dec	08:42	16:27	08:56	09:28
26-Dec	08:42	16:27	10:09	10:21
27-Dec	08:42	16:28	08:56	09:29
27-Dec	08:42	16:28	10:11	10:21
28-Dec	08:42	16:29	08:57	09:30
28-Dec	08:42	16:29	10:13	10:20
29-Dec	08:42	16:29	08:57	09:30
30-Dec	08:42	16:30	08:57	09:31
31-Dec	08:42	16:31	08:58	09:31

Turbine 18

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
01-Jan	08:42	16:32	15:01	15:26
02-Jan	08:42	16:33	15:02	15:26
03-Jan	08:42	16:34	15:04	15:26
04-Jan	08:41	16:35	15:06	15:25
04-Jan	08:41	16:35	16:32	16:39
05-Jan	08:41	16:36	15:08	15:25
05-Jan	08:41	16:36	16:30	16:42
06-Jan	08:41	16:38	15:09	15:24
06-Jan	08:41	16:38	16:29	16:43
07-Jan	08:40	16:39	15:12	15:22
07-Jan	08:40	16:39	16:29	16:45
08-Jan	08:40	16:40	16:28	16:46
09-Jan	08:39	16:42	16:28	16:48
10-Jan	08:39	16:43	16:27	16:49
11-Jan	08:38	16:44	16:27	16:51
12-Jan	08:38	16:46	16:27	16:52
13-Jan	08:37	16:47	16:26	16:53
14-Jan	08:36	16:49	16:26	16:55
15-Jan	08:35	16:50	16:26	16:56
16-Jan	08:34	16:52	16:26	16:57
17-Jan	08:33	16:54	16:26	16:58
18-Jan	08:33	16:55	16:26	16:59

19-Jan	08:32	16:57	16:26	17:00
20-Jan	08:30	16:59	16:26	17:00
21-Jan	08:29	17:00	16:26	17:01
22-Jan	08:28	17:02	16:26	17:02
23-Jan	08:27	17:04	16:26	17:02
24-Jan	08:26	17:06	16:26	17:03
25-Jan	08:24	17:07	16:26	17:03
26-Jan	08:23	17:09	16:26	17:04
27-Jan	08:22	17:11	16:27	17:04
28-Jan	08:20	17:13	16:27	17:04
29-Jan	08:19	17:15	16:28	17:04
30-Jan	08:17	17:16	16:28	17:04
31-Jan	08:16	17:18	16:29	17:04
01-Feb	08:14	17:20	16:29	17:04
02-Feb	08:13	17:22	16:30	17:03
03-Feb	08:11	17:24	16:31	17:03
04-Feb	08:10	17:26	16:32	17:02
05-Feb	08:08	17:27	16:34	17:01
06-Feb	08:06	17:29	16:35	17:00
07-Feb	08:05	17:31	16:37	16:59
08-Feb	08:03	17:33	16:39	16:58
09-Feb	08:01	17:35	16:41	16:55
10-Feb	07:59	17:37	16:46	16:50
18-Mar	06:40	18:44	06:58	07:16
19-Mar	06:37	18:46	06:55	07:19
20-Mar	06:35	18:47	06:53	07:22
21-Mar	06:33	18:49	06:51	07:23
22-Mar	06:31	18:51	06:49	07:25
23-Mar	06:28	18:53	06:47	07:26
24-Mar	06:26	18:54	06:46	07:26
25-Mar	06:24	18:56	06:45	07:27
26-Mar	06:21	18:58	06:44	07:28
27-Mar	06:19	18:59	06:43	07:28
28-Mar	06:17	19:01	06:43	07:28
29-Mar	06:14	19:03	06:42	07:28
30-Mar	06:12	19:05	06:42	07:28
31-Mar	06:10	19:06	06:41	07:28
01-Apr	06:07	19:08	06:41	07:27
02-Apr	06:05	19:10	06:40	07:27
03-Apr	06:03	19:11	06:40	07:26
04-Apr	06:00	19:13	06:40	07:26
05-Apr	05:58	19:15	06:40	07:25
06-Apr	05:56	19:17	06:40	07:24
07-Apr	05:54	19:18	06:40	07:23
08-Apr	05:51	19:20	06:41	07:22
09-Apr	05:49	19:22	06:42	07:21
10-Apr	05:47	19:23	06:42	07:19
11-Apr	05:45	19:25	06:43	07:17
12-Apr	05:42	19:27	06:44	07:15
13-Apr	05:40	19:29	06:46	07:12
14-Apr	05:38	19:30	06:48	07:09
15-Apr	05:36	19:32	06:51	07:05
06-May	04:54	20:08	05:18	05:31
07-May	04:52	20:09	05:16	05:33
08-May	04:50	20:11	05:14	05:34
09-May	04:48	20:12	05:13	05:35
10-May	04:47	20:14	05:11	05:36
11-May	04:45	20:16	05:10	05:37
12-May	04:43	20:17	05:09	05:38

13-May	04:42	20:19	05:08	05:38
14-May	04:40	20:20	05:07	05:39
15-May	04:39	20:22	05:07	05:39
16-May	04:37	20:23	05:06	05:39
17-May	04:36	20:25	05:06	05:40
18-May	04:34	20:26	05:06	05:40
19-May	04:33	20:28	05:06	05:40
20-May	04:32	20:29	05:06	05:40
21-May	04:30	20:31	05:05	05:40
22-May	04:29	20:32	05:05	05:40
23-May	04:28	20:34	05:06	05:40
24-May	04:27	20:35	05:06	05:40
25-May	04:25	20:36	05:06	05:40
26-May	04:24	20:38	05:06	05:40
27-May	04:23	20:39	05:06	05:39
28-May	04:22	20:40	05:07	05:39
29-May	04:21	20:41	05:07	05:39
30-May	04:20	20:42	05:07	05:39
31-May	04:20	20:44	05:08	05:39
01-Jun	04:19	20:45	05:08	05:38
02-Jun	04:18	20:46	05:09	05:38
03-Jun	04:17	20:47	05:09	05:38
04-Jun	04:16	20:48	05:10	05:38
05-Jun	04:16	20:49	05:10	05:37
06-Jun	04:15	20:50	05:11	05:37
07-Jun	04:15	20:50	05:11	05:37
08-Jun	04:14	20:51	05:12	05:37
09-Jun	04:14	20:52	05:12	05:37
10-Jun	04:13	20:53	05:13	05:37
11-Jun	04:13	20:54	05:13	05:36
12-Jun	04:13	20:54	05:14	05:36
13-Jun	04:13	20:55	05:14	05:36
14-Jun	04:13	20:55	05:15	05:36
15-Jun	04:12	20:56	05:15	05:36
16-Jun	04:12	20:56	05:16	05:36
17-Jun	04:12	20:57	05:16	05:36
18-Jun	04:12	20:57	05:16	05:36
19-Jun	04:13	20:57	05:17	05:36
20-Jun	04:13	20:58	05:17	05:36
21-Jun	04:13	20:58	05:17	05:36
22-Jun	04:13	20:58	05:17	05:37
23-Jun	04:13	20:58	05:17	05:37
24-Jun	04:14	20:58	05:18	05:37
25-Jun	04:14	20:58	05:18	05:38
26-Jun	04:15	20:58	05:18	05:38
27-Jun	04:15	20:58	05:18	05:39
28-Jun	04:16	20:58	05:18	05:39
29-Jun	04:16	20:57	05:17	05:40
30-Jun	04:17	20:57	05:17	05:40
01-Jul	04:18	20:57	05:17	05:41
02-Jul	04:18	20:56	05:17	05:41
03-Jul	04:19	20:56	05:17	05:42
04-Jul	04:20	20:55	05:17	05:42
05-Jul	04:21	20:55	05:17	05:43
06-Jul	04:22	20:54	05:16	05:44
07-Jul	04:23	20:54	05:16	05:44
08-Jul	04:24	20:53	05:16	05:45
09-Jul	04:25	20:52	05:16	05:45
10-Jul	04:26	20:51	05:16	05:46

11-Jul	04:27	20:50	05:16	05:46
12-Jul	04:28	20:50	05:16	05:47
13-Jul	04:29	20:49	05:15	05:47
14-Jul	04:30	20:48	05:15	05:48
15-Jul	04:32	20:47	05:15	05:48
16-Jul	04:33	20:46	05:15	05:48
17-Jul	04:34	20:44	05:15	05:49
18-Jul	04:35	20:43	05:15	05:49
19-Jul	04:37	20:42	05:15	05:49
20-Jul	04:38	20:41	05:15	05:50
21-Jul	04:39	20:40	05:15	05:50
22-Jul	04:41	20:38	05:15	05:50
23-Jul	04:42	20:37	05:16	05:50
24-Jul	04:44	20:35	05:16	05:50
25-Jul	04:45	20:34	05:16	05:50
26-Jul	04:46	20:32	05:16	05:50
27-Jul	04:48	20:31	05:17	05:49
28-Jul	04:49	20:29	05:17	05:49
29-Jul	04:51	20:28	05:18	05:49
30-Jul	04:52	20:26	05:19	05:48
31-Jul	04:54	20:25	05:19	05:47
01-Aug	04:56	20:23	05:21	05:47
02-Aug	04:57	20:21	05:22	05:46
03-Aug	04:59	20:19	05:23	05:45
04-Aug	05:00	20:18	05:25	05:43
05-Aug	05:02	20:16	05:26	05:41
06-Aug	05:03	20:14	05:29	05:39
27-Aug	05:38	19:31	06:52	07:08
28-Aug	05:39	19:29	06:49	07:11
29-Aug	05:41	19:27	06:46	07:13
30-Aug	05:42	19:24	06:44	07:15
31-Aug	05:44	19:22	06:42	07:17
01-Sep	05:46	19:20	06:41	07:18
02-Sep	05:47	19:17	06:39	07:19
03-Sep	05:49	19:15	06:38	07:20
04-Sep	05:51	19:13	06:37	07:20
05-Sep	05:52	19:11	06:36	07:20
06-Sep	05:54	19:08	06:36	07:21
07-Sep	05:55	19:06	06:35	07:21
08-Sep	05:57	19:04	06:34	07:21
09-Sep	05:59	19:01	06:34	07:21
10-Sep	06:00	18:59	06:34	07:20
11-Sep	06:02	18:57	06:33	07:20
12-Sep	06:04	18:54	06:33	07:20
13-Sep	06:05	18:52	06:33	07:19
14-Sep	06:07	18:50	06:33	07:18
15-Sep	06:09	18:47	06:33	07:18
16-Sep	06:10	18:45	06:33	07:17
17-Sep	06:12	18:43	06:33	07:16
18-Sep	06:13	18:40	06:33	07:14
19-Sep	06:15	18:38	06:34	07:13
20-Sep	06:17	18:36	06:35	07:11
21-Sep	06:18	18:33	06:36	07:09
22-Sep	06:20	18:31	06:38	07:07
23-Sep	06:22	18:29	06:39	07:04
24-Sep	06:23	18:26	06:42	07:01
31-Oct	07:27	17:06	16:14	16:21
01-Nov	07:29	17:04	16:10	16:25
02-Nov	07:31	17:02	16:08	16:27

03-Nov	07:33	17:00	16:06	16:29
04-Nov	07:35	16:59	16:05	16:30
05-Nov	07:36	16:57	16:03	16:31
06-Nov	07:38	16:55	16:02	16:32
07-Nov	07:40	16:54	16:01	16:33
08-Nov	07:42	16:52	16:00	16:34
09-Nov	07:44	16:50	16:00	16:34
10-Nov	07:45	16:49	15:59	16:35
11-Nov	07:47	16:47	15:59	16:35
12-Nov	07:49	16:46	15:59	16:35
13-Nov	07:51	16:44	15:59	16:36
14-Nov	07:52	16:43	15:59	16:36
15-Nov	07:54	16:41	15:59	16:36
16-Nov	07:56	16:40	15:59	16:36
17-Nov	07:58	16:39	15:59	16:36
18-Nov	07:59	16:37	15:59	16:36
19-Nov	08:01	16:36	16:00	16:36
20-Nov	08:03	16:35	16:00	16:36
21-Nov	08:04	16:34	16:01	16:35
22-Nov	08:06	16:33	16:01	16:35
23-Nov	08:08	16:32	16:02	16:35
24-Nov	08:09	16:31	16:03	16:35
25-Nov	08:11	16:30	16:03	16:34
26-Nov	08:13	16:29	16:04	16:34
27-Nov	08:14	16:28	16:05	16:34
28-Nov	08:16	16:27	16:06	16:33
29-Nov	08:17	16:26	16:07	16:33
30-Nov	08:18	16:26	16:08	16:32
01-Dec	08:20	16:25	16:09	16:31
02-Dec	08:21	16:24	16:10	16:31
03-Dec	08:23	16:24	16:11	16:30
04-Dec	08:24	16:23	14:57	15:06
04-Dec	08:24	16:23	16:13	16:30
05-Dec	08:25	16:23	14:55	15:09
05-Dec	08:25	16:23	16:14	16:29
06-Dec	08:27	16:22	14:54	15:11
06-Dec	08:27	16:22	16:16	16:28
07-Dec	08:28	16:22	14:53	15:12
07-Dec	08:28	16:22	16:18	16:27
08-Dec	08:29	16:22	14:53	15:14
09-Dec	08:30	16:22	14:51	15:15
10-Dec	08:31	16:22	14:51	15:16
11-Dec	08:32	16:21	14:50	15:17
12-Dec	08:33	16:21	14:50	15:18
13-Dec	08:34	16:21	14:50	15:19
14-Dec	08:35	16:21	14:50	15:20
15-Dec	08:36	16:22	14:50	15:20
16-Dec	08:37	16:22	14:50	15:21
17-Dec	08:37	16:22	14:50	15:22
18-Dec	08:38	16:22	14:51	15:22
19-Dec	08:39	16:23	14:51	15:23
20-Dec	08:39	16:23	14:52	15:23
21-Dec	08:40	16:24	14:52	15:24
22-Dec	08:40	16:24	14:53	15:24
23-Dec	08:41	16:25	14:53	15:24
24-Dec	08:41	16:25	14:54	15:25
25-Dec	08:41	16:26	14:55	15:26
26-Dec	08:42	16:27	14:55	15:26
27-Dec	08:42	16:28	14:56	15:26

28-Dec	08:42	16:29	14:57	15:26
29-Dec	08:42	16:29	14:58	15:26
30-Dec	08:42	16:30	14:59	15:26
31-Dec	08:42	16:31	15:00	15:26

Turbine 19

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
12-Mar	06:54	18:33	07:18	07:23
13-Mar	06:51	18:35	07:13	07:27
14-Mar	06:49	18:37	07:10	07:29
15-Mar	06:47	18:39	07:08	07:31
16-Mar	06:44	18:40	07:06	07:32
17-Mar	06:42	18:42	07:03	07:32
18-Mar	06:40	18:44	07:01	07:33
19-Mar	06:37	18:46	07:00	07:33
20-Mar	06:35	18:47	06:59	07:33
21-Mar	06:33	18:49	06:58	07:33
22-Mar	06:31	18:51	06:58	07:32
23-Mar	06:28	18:53	06:57	07:32
24-Mar	06:26	18:54	06:51	07:31
24-Mar	06:26	18:54	18:32	18:44
25-Mar	06:24	18:56	06:48	07:30
25-Mar	06:24	18:56	18:28	18:48
26-Mar	06:21	18:58	06:46	07:29
26-Mar	06:21	18:58	18:25	18:50
27-Mar	06:19	18:59	06:44	07:28
27-Mar	06:19	18:59	18:23	18:54
28-Mar	06:17	19:01	06:42	07:27
28-Mar	06:17	19:01	18:22	18:56
29-Mar	06:14	19:03	06:40	07:26
29-Mar	06:14	19:03	18:20	18:58
30-Mar	06:12	19:05	06:39	07:25
30-Mar	06:12	19:05	18:19	18:59
31-Mar	06:10	19:06	06:37	07:23
31-Mar	06:10	19:06	18:18	19:01
01-Apr	06:07	19:08	06:36	07:21
01-Apr	06:07	19:08	18:17	19:01
02-Apr	06:05	19:10	06:36	07:17
02-Apr	06:05	19:10	18:16	19:02
03-Apr	06:03	19:11	06:31	07:16
03-Apr	06:03	19:11	18:16	19:02
04-Apr	06:00	19:13	06:27	07:16
04-Apr	06:00	19:13	18:15	19:02
05-Apr	05:58	19:15	06:25	07:15
05-Apr	05:58	19:15	18:15	19:02
06-Apr	05:56	19:17	06:23	07:15
06-Apr	05:56	19:17	18:15	19:02
07-Apr	05:54	19:18	06:21	07:14
07-Apr	05:54	19:18	18:15	19:01
08-Apr	05:51	19:20	06:19	07:13
08-Apr	05:51	19:20	18:15	19:01
09-Apr	05:49	19:22	06:18	07:12
09-Apr	05:49	19:22	18:15	19:00
10-Apr	05:47	19:23	06:17	07:11
10-Apr	05:47	19:23	18:15	18:59
11-Apr	05:45	19:25	06:16	07:10
11-Apr	05:45	19:25	18:15	18:58
12-Apr	05:42	19:27	06:15	07:09
12-Apr	05:42	19:27	18:16	18:56

13-Apr	05:40	19:29	06:15	07:07
13-Apr	05:40	19:29	18:17	18:54
14-Apr	05:38	19:30	06:14	07:06
14-Apr	05:38	19:30	18:18	18:51
15-Apr	05:36	19:32	06:14	07:04
15-Apr	05:36	19:32	18:19	18:49
16-Apr	05:34	19:34	06:14	07:02
16-Apr	05:34	19:34	18:20	18:47
17-Apr	05:31	19:35	06:14	06:58
17-Apr	05:31	19:35	18:22	18:45
18-Apr	05:29	19:37	06:14	06:45
18-Apr	05:29	19:37	06:46	06:53
18-Apr	05:29	19:37	18:24	18:42
19-Apr	05:27	19:39	06:15	06:44
19-Apr	05:27	19:39	18:28	18:37
20-Apr	05:25	19:41	06:16	06:43
21-Apr	05:23	19:42	06:16	06:42
22-Apr	05:21	19:44	06:17	06:40
23-Apr	05:19	19:46	06:19	06:38
24-Apr	05:17	19:47	06:21	06:35
25-Apr	05:15	19:49	06:27	06:29
17-Aug	05:21	19:52	06:30	06:38
18-Aug	05:23	19:50	06:26	06:41
19-Aug	05:24	19:48	06:24	06:44
20-Aug	05:26	19:46	06:22	06:45
21-Aug	05:28	19:44	06:20	06:47
22-Aug	05:29	19:42	06:19	06:48
22-Aug	05:29	19:42	18:30	18:43
23-Aug	05:31	19:40	06:18	06:48
23-Aug	05:31	19:40	18:26	18:46
24-Aug	05:33	19:38	06:17	06:58
24-Aug	05:33	19:38	18:24	18:48
25-Aug	05:34	19:35	06:17	07:02
25-Aug	05:34	19:35	18:22	18:50
26-Aug	05:36	19:33	06:16	07:04
26-Aug	05:36	19:33	18:20	18:51
27-Aug	05:38	19:31	06:16	07:06
27-Aug	05:38	19:31	18:19	18:53
28-Aug	05:39	19:29	06:15	07:07
28-Aug	05:39	19:29	18:17	18:55
29-Aug	05:41	19:27	06:15	07:08
29-Aug	05:41	19:27	18:16	18:56
30-Aug	05:42	19:24	06:15	07:09
30-Aug	05:42	19:24	18:15	18:57
31-Aug	05:44	19:22	06:15	07:10
31-Aug	05:44	19:22	18:14	18:58
01-Sep	05:46	19:20	06:16	07:10
01-Sep	05:46	19:20	18:13	18:58
02-Sep	05:47	19:17	06:16	07:11
02-Sep	05:47	19:17	18:12	18:59
03-Sep	05:49	19:15	06:17	07:11
03-Sep	05:49	19:15	18:12	18:59
04-Sep	05:51	19:13	06:18	07:11
04-Sep	05:51	19:13	18:11	18:58
05-Sep	05:52	19:11	06:19	07:11
05-Sep	05:52	19:11	18:11	18:58
06-Sep	05:54	19:08	06:21	07:11
06-Sep	05:54	19:08	18:10	18:58
07-Sep	05:55	19:06	06:22	07:11

07-Sep	05:55	19:06	18:10	18:57
08-Sep	05:57	19:04	06:26	07:10
08-Sep	05:57	19:04	18:10	18:56
09-Sep	05:59	19:01	06:29	07:11
09-Sep	05:59	19:01	18:10	18:55
10-Sep	06:00	18:59	06:30	07:14
10-Sep	06:00	18:59	18:11	18:53
11-Sep	06:02	18:57	06:30	07:15
11-Sep	06:02	18:57	18:11	18:52
12-Sep	06:04	18:54	06:30	07:16
12-Sep	06:04	18:54	18:11	18:49
13-Sep	06:05	18:52	06:31	07:17
13-Sep	06:05	18:52	18:12	18:47
14-Sep	06:07	18:50	06:32	07:18
14-Sep	06:07	18:50	18:13	18:44
15-Sep	06:09	18:47	06:34	07:18
15-Sep	06:09	18:47	18:15	18:39
16-Sep	06:10	18:45	06:35	07:18
16-Sep	06:10	18:45	18:17	18:37
17-Sep	06:12	18:43	06:37	07:19
17-Sep	06:12	18:43	18:20	18:33
18-Sep	06:13	18:40	06:39	07:19
19-Sep	06:15	18:38	06:43	07:19
20-Sep	06:17	18:36	06:44	07:19
21-Sep	06:18	18:33	06:44	07:19
22-Sep	06:20	18:31	06:44	07:18
23-Sep	06:22	18:29	06:45	07:18
24-Sep	06:23	18:26	06:45	07:17
25-Sep	06:25	18:24	06:46	07:16
26-Sep	06:27	18:22	06:48	07:15
27-Sep	06:28	18:19	06:50	07:13
28-Sep	06:30	18:17	06:51	07:11
29-Sep	06:32	18:15	06:53	07:09
30-Sep	06:33	18:12	06:56	07:05

Turbine 20

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
30-Apr	05:05	19:58	05:51	05:59
01-May	05:03	19:59	05:47	06:02
02-May	05:01	20:01	05:45	06:04
03-May	04:59	20:03	05:44	06:05
04-May	04:57	20:04	05:42	06:06
05-May	04:55	20:06	05:41	06:07
06-May	04:54	20:08	05:40	06:07
07-May	04:52	20:09	05:39	06:08
08-May	04:50	20:11	05:37	06:08
09-May	04:48	20:12	05:36	06:08
10-May	04:47	20:14	05:35	06:09
11-May	04:45	20:16	05:33	06:09
12-May	04:43	20:17	05:33	06:09
13-May	04:42	20:19	05:32	06:09
14-May	04:40	20:20	05:31	06:08
15-May	04:39	20:22	05:31	06:08
16-May	04:37	20:23	05:31	06:08
17-May	04:36	20:25	05:30	06:08
18-May	04:34	20:26	05:30	06:07
19-May	04:33	20:28	05:30	06:07
20-May	04:32	20:29	05:30	06:07
21-May	04:30	20:31	05:23	06:06

22-May	04:29	20:32	05:21	06:05
23-May	04:28	20:34	05:20	06:05
24-May	04:27	20:35	05:19	06:04
25-May	04:25	20:36	05:18	06:04
26-May	04:24	20:38	05:17	06:03
27-May	04:23	20:39	05:16	06:02
28-May	04:22	20:40	05:15	06:02
29-May	04:21	20:41	05:15	06:02
30-May	04:20	20:42	05:14	06:01
31-May	04:20	20:44	05:13	06:01
01-Jun	04:19	20:45	05:11	06:01
02-Jun	04:18	20:46	05:10	06:01
03-Jun	04:17	20:47	05:10	06:00
04-Jun	04:16	20:48	05:09	06:00
05-Jun	04:16	20:49	05:09	06:00
06-Jun	04:15	20:50	05:08	06:00
07-Jun	04:15	20:50	05:08	05:59
08-Jun	04:14	20:51	05:08	05:59
09-Jun	04:14	20:52	05:07	05:59
10-Jun	04:13	20:53	05:07	05:59
11-Jun	04:13	20:54	05:07	05:58
12-Jun	04:13	20:54	05:07	05:58
13-Jun	04:13	20:55	05:06	05:58
14-Jun	04:13	20:55	05:06	05:58
15-Jun	04:12	20:56	05:06	05:57
16-Jun	04:12	20:56	05:06	05:57
17-Jun	04:12	20:57	05:07	05:57
18-Jun	04:12	20:57	05:07	05:57
19-Jun	04:13	20:57	05:07	05:57
20-Jun	04:13	20:58	05:07	05:57
21-Jun	04:13	20:58	05:07	05:58
22-Jun	04:13	20:58	05:07	05:58
23-Jun	04:13	20:58	05:08	05:58
24-Jun	04:14	20:58	05:08	05:59
25-Jun	04:14	20:58	05:08	05:59
26-Jun	04:15	20:58	05:09	06:00
27-Jun	04:15	20:58	05:09	06:00
28-Jun	04:16	20:58	05:10	06:01
29-Jun	04:16	20:57	05:10	06:02
30-Jun	04:17	20:57	05:11	06:02
01-Jul	04:18	20:57	05:11	06:03
02-Jul	04:18	20:56	05:12	06:04
03-Jul	04:19	20:56	05:12	06:04
04-Jul	04:20	20:55	05:13	06:05
05-Jul	04:21	20:55	05:14	06:05
06-Jul	04:22	20:54	05:15	06:06
07-Jul	04:23	20:54	05:15	06:07
08-Jul	04:24	20:53	05:16	06:07
09-Jul	04:25	20:52	05:17	06:08
10-Jul	04:26	20:51	05:18	06:08
11-Jul	04:27	20:50	05:20	06:09
12-Jul	04:28	20:50	05:22	06:09
13-Jul	04:29	20:49	05:23	06:10
14-Jul	04:30	20:48	05:24	06:10
15-Jul	04:32	20:47	05:25	06:11
16-Jul	04:33	20:46	05:26	06:12
17-Jul	04:34	20:44	05:27	06:13
18-Jul	04:35	20:43	05:28	06:13
19-Jul	04:37	20:42	05:29	06:14

20-Jul	04:38	20:41	05:30	06:15
21-Jul	04:39	20:40	05:32	06:16
22-Jul	04:41	20:38	05:35	06:16
23-Jul	04:42	20:37	05:40	06:17
24-Jul	04:44	20:35	05:40	06:17
25-Jul	04:45	20:34	05:40	06:18
26-Jul	04:46	20:32	05:41	06:18
27-Jul	04:48	20:31	05:41	06:18
28-Jul	04:49	20:29	05:41	06:19
29-Jul	04:51	20:28	05:42	06:19
30-Jul	04:52	20:26	05:42	06:19
31-Jul	04:54	20:25	05:43	06:19
01-Aug	04:56	20:23	05:44	06:19
02-Aug	04:57	20:21	05:45	06:18
03-Aug	04:59	20:19	05:46	06:18
04-Aug	05:00	20:18	05:47	06:17
05-Aug	05:02	20:16	05:49	06:17
06-Aug	05:03	20:14	05:50	06:16
07-Aug	05:05	20:12	05:50	06:15
08-Aug	05:07	20:10	05:52	06:14
09-Aug	05:08	20:08	05:53	06:13
10-Aug	05:10	20:07	05:54	06:11
11-Aug	05:11	20:05	05:56	06:09
12-Aug	05:13	20:03	06:01	06:04

Turbine 21

Day-Month	SunriseHours:Minutes	SunsetHours:Minutes	BeginHours:Minutes	EndHours:Minutes
17-Apr	05:31	19:35	06:23	06:29
18-Apr	05:29	19:37	06:19	06:33
19-Apr	05:27	19:39	06:16	06:35
20-Apr	05:25	19:41	06:14	06:36
21-Apr	05:23	19:42	06:13	06:37
22-Apr	05:21	19:44	06:11	06:38
23-Apr	05:19	19:46	06:09	06:39
24-Apr	05:17	19:47	06:08	06:39
25-Apr	05:15	19:49	06:07	06:39
26-Apr	05:13	19:51	06:06	06:39
27-Apr	05:11	19:53	06:05	06:40
28-Apr	05:09	19:54	06:05	06:39
29-Apr	05:07	19:56	06:05	06:39
30-Apr	05:05	19:58	06:04	06:39
01-May	05:03	19:59	06:04	06:39
02-May	05:01	20:01	06:04	06:38
03-May	04:59	20:03	06:04	06:37
04-May	04:57	20:04	06:04	06:37
05-May	04:55	20:06	06:05	06:36
06-May	04:54	20:08	05:55	06:35
07-May	04:52	20:09	05:53	06:34
08-May	04:50	20:11	05:51	06:33
09-May	04:48	20:12	05:50	06:32
10-May	04:47	20:14	05:48	06:31
11-May	04:45	20:16	05:47	06:29
12-May	04:43	20:17	05:46	06:27
13-May	04:42	20:19	05:45	06:24
14-May	04:40	20:20	05:44	06:17
15-May	04:39	20:22	05:43	06:18
16-May	04:37	20:23	05:43	06:18
17-May	04:36	20:25	05:42	06:18
18-May	04:34	20:26	05:42	06:19

19-May	04:33	20:28	05:42	06:19
20-May	04:32	20:29	05:42	06:19
21-May	04:30	20:31	05:41	06:19
22-May	04:29	20:32	05:28	05:38
22-May	04:29	20:32	05:41	06:19
23-May	04:28	20:34	05:26	05:40
23-May	04:28	20:34	05:41	06:19
24-May	04:27	20:35	05:25	05:41
24-May	04:27	20:35	05:41	06:20
25-May	04:25	20:36	05:24	05:42
25-May	04:25	20:36	05:41	06:20
26-May	04:24	20:38	05:23	06:20
27-May	04:23	20:39	05:22	06:20
28-May	04:22	20:40	05:22	06:20
29-May	04:21	20:41	05:21	06:20
30-May	04:20	20:42	05:20	06:19
31-May	04:20	20:44	05:20	06:19
01-Jun	04:19	20:45	05:19	06:19
02-Jun	04:18	20:46	05:19	06:19
03-Jun	04:17	20:47	05:19	06:19
04-Jun	04:16	20:48	05:19	06:19
05-Jun	04:16	20:49	05:19	06:19
06-Jun	04:15	20:50	05:19	06:19
07-Jun	04:15	20:50	05:18	06:19
08-Jun	04:14	20:51	05:18	06:19
09-Jun	04:14	20:52	05:18	06:19
10-Jun	04:13	20:53	05:19	06:19
11-Jun	04:13	20:54	05:19	06:19
12-Jun	04:13	20:54	05:19	06:19
13-Jun	04:13	20:55	05:19	06:19
14-Jun	04:13	20:55	05:19	06:19
15-Jun	04:12	20:56	05:19	06:19
16-Jun	04:12	20:56	05:19	06:19
17-Jun	04:12	20:57	05:20	06:19
18-Jun	04:12	20:57	05:20	06:19
19-Jun	04:13	20:57	05:20	06:19
20-Jun	04:13	20:58	05:20	06:19
21-Jun	04:13	20:58	05:20	06:20
22-Jun	04:13	20:58	05:21	06:20
23-Jun	04:13	20:58	05:21	06:20
24-Jun	04:14	20:58	05:21	06:20
25-Jun	04:14	20:58	05:21	06:21
26-Jun	04:15	20:58	05:22	06:21
27-Jun	04:15	20:58	05:22	06:21
28-Jun	04:16	20:58	05:22	06:22
29-Jun	04:16	20:57	05:22	06:22
30-Jun	04:17	20:57	05:23	06:23
01-Jul	04:18	20:57	05:23	06:23
02-Jul	04:18	20:56	05:23	06:23
03-Jul	04:19	20:56	05:24	06:24
04-Jul	04:20	20:55	05:24	06:24
05-Jul	04:21	20:55	05:24	06:25
06-Jul	04:22	20:54	05:25	06:25
07-Jul	04:23	20:54	05:25	06:26
08-Jul	04:24	20:53	05:26	06:26
09-Jul	04:25	20:52	05:26	06:26
10-Jul	04:26	20:51	05:27	06:27
11-Jul	04:27	20:50	05:27	06:27
12-Jul	04:28	20:50	05:28	06:27

13-Jul	04:29	20:49	05:29	06:28
14-Jul	04:30	20:48	05:30	06:28
15-Jul	04:32	20:47	05:31	06:28
16-Jul	04:33	20:46	05:32	06:29
17-Jul	04:34	20:44	05:32	06:29
18-Jul	04:35	20:43	05:33	05:51
18-Jul	04:35	20:43	05:51	06:29
19-Jul	04:37	20:42	05:35	05:50
19-Jul	04:37	20:42	05:51	06:29
20-Jul	04:38	20:41	05:36	05:48
20-Jul	04:38	20:41	05:51	06:29
21-Jul	04:39	20:40	05:39	05:46
21-Jul	04:39	20:40	05:51	06:29
22-Jul	04:41	20:38	05:51	06:29
23-Jul	04:42	20:37	05:52	06:29
24-Jul	04:44	20:35	05:52	06:29
25-Jul	04:45	20:34	05:52	06:29
26-Jul	04:46	20:32	05:53	06:28
27-Jul	04:48	20:31	05:53	06:28
28-Jul	04:49	20:29	05:54	06:28
29-Jul	04:51	20:28	05:54	06:27
29-Jul	04:51	20:28	06:26	06:32
30-Jul	04:52	20:26	05:55	06:36
31-Jul	04:54	20:25	05:56	06:38
01-Aug	04:56	20:23	05:57	06:40
02-Aug	04:57	20:21	05:59	06:42
03-Aug	04:59	20:19	06:00	06:43
04-Aug	05:00	20:18	06:01	06:43
05-Aug	05:02	20:16	06:03	06:44
06-Aug	05:03	20:14	06:06	06:45
07-Aug	05:05	20:12	06:14	06:45
08-Aug	05:07	20:10	06:13	06:46
09-Aug	05:08	20:08	06:13	06:46
10-Aug	05:10	20:07	06:12	06:47
11-Aug	05:11	20:05	06:12	06:47
12-Aug	05:13	20:03	06:12	06:47
13-Aug	05:15	20:01	06:12	06:47
14-Aug	05:16	19:59	06:12	06:47
15-Aug	05:18	19:57	06:12	06:46
16-Aug	05:20	19:55	06:13	06:46
17-Aug	05:21	19:52	06:13	06:45
18-Aug	05:23	19:50	06:14	06:45
19-Aug	05:24	19:48	06:15	06:44
20-Aug	05:26	19:46	06:16	06:43
21-Aug	05:28	19:44	06:18	06:41
22-Aug	05:29	19:42	06:19	06:40
23-Aug	05:31	19:40	06:20	06:38
24-Aug	05:33	19:38	06:22	06:35

Turbine 22

There are no shadows cast by this turbine at any receptor within the study area

Turbine 23

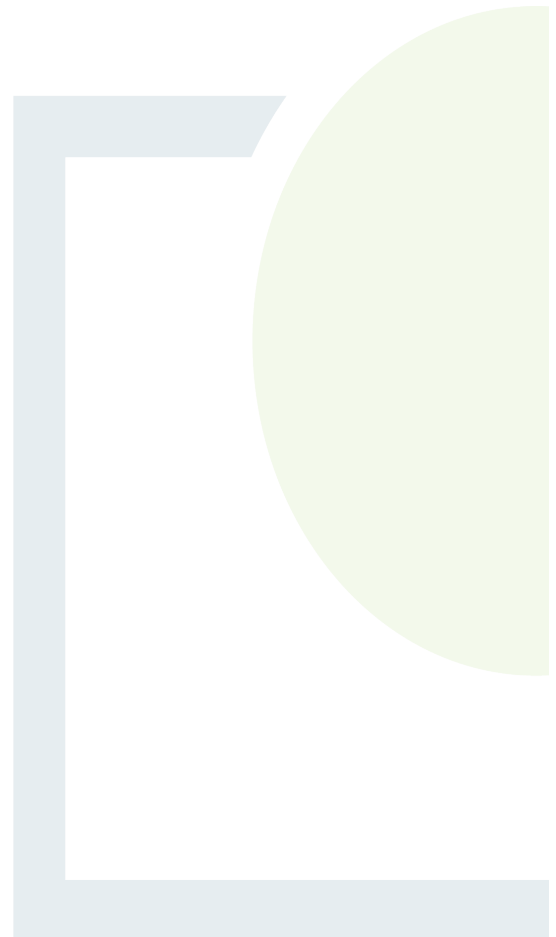
There are no shadows cast by this turbine at any receptor within the study area



CONSULTANTS IN
ENGINEERING,
ENVIRONMENTAL SCIENCE &
PLANNING

APPENDIX 12.3

Moneygorm Shadow
Flicker Report





11 SHADOW FLICKER

11.1 INTRODUCTION

11.1.1 The Wind Energy Planning Guidelines (DoEHLG, 2006) describe shadow flicker as follows: "The effect known as shadow flicker occurs where the blades of a wind turbine cast a shadow over a window in a nearby house and the rotation of the blades causes the shadow to flick on and off." It may occur from time to time at wind farm developments which are in the proximity of houses.

11.1.2 The main concern about shadow flicker is the impact it may have on dwellings where a window faces directly on to the windfarm. This flicker effect may cause a nuisance for the occupant in this case. The effect only lasts for a short period of time and under certain conditions.

11.1.3 The extent of shadow flicker effects depends on:

- The time of the day and the day of the year;
- Duration of flicker event;
- Weather conditions;
- Height of turbine and rotor diameter size;
- Orientation of wind turbine (this is related to wind direction);
- Distance of the turbine to the receptor (as shadow flicker diminishes with distance);
- Type and frequency of use of the affected area in the property;
- Size of window and types of curtains or blinds fitted;
- Presence of mitigating factors such as screening effects of topography and/or vegetation between the turbine and receptor (i.e. dwelling house, office).



11.1.4 Shadow flicker effects that cause nuisance tend occur when the sun is low in the sky. This limits the time periods that the effects can be observed to certain times of year and certain limited times of the day. Generally in the first few hours after sun rise and before sun set.

11.1.5 During the short periods of time at which it is possible for shadow flicker to occur quite specific weather conditions must also be present if the effect is to be noticeable by an observer. The sun must be shining and the wind must be blowing at a speed sufficient for the turbine to be operating (over approximately 4m/s).

11.1.6 The combination of these weather conditions with the periods of time when shadow flicker is possible at a location would rarely occur.

Wind Energy Guidelines

11.1.7 The Wind Energy Planning Guidelines recommend that shadow flicker at offices and houses within 500m of a wind turbine should not exceed 30 hours per year or 30 minutes per day.

11.1.8 The Wind Energy Planning Guidelines also state that "at distances greater than 10 rotor diameters from a turbine, the potential for shadow flicker is very low. Where shadow flicker could be a problem, developers should provide calculations to quantify the effect and where appropriate take measures to prevent or ameliorate the potential effect, such as by turning off a particular turbine at certain times."

11.2 EXISTING ENVIRONMENT

11.2.1 There are no wind farm developments in the immediate area and so there is currently no potential shadow flicker effects present in the existing environment.

- 11.2.2 Existing dwellings and other buildings (sheds, garages, etc) at locations that have been identified in proximity to the Moneygorm turbine location have been assessed to establish whether they are at risk from shadow flicker occurrence.
- 11.2.3 Receptors further away are not included in this assessment as the Moneygorm development will not add perceptible shadow flicker effects at these receptors due to their location and distance from the turbine.
- 11.2.4 Receptor locations were established by desktop examination of Ordnance Survey Ireland map data and satellite photography. In low risk areas locations that are representative of house locations are sufficient to assess whether particular receptor will be at risk, precise locations are not required.

11.3 SHADOW FLICKER MODELLING

- 11.3.1 The Shadow Flicker modelling has been carried out using the computer simulation package WindPRO 2.7.486 from EMD International A/S.
- 11.3.2 In order to calculate the 'theoretical' values for flicker effects at the receptors identified as potentially at risk the software model takes the following into account:
- Trajectory of the sun (with a minimum sun angle of 3° above the horizon);
 - Turbine location and dimensions;
 - Receptor locations;
 - Terrain elevation and level differences between turbines and receptors;
 - The model specifies that turbine blades need to be covered by a minimum of 20% of the sun to cause flicker.
- 11.3.3 The turbine location has been chosen to be consistent with the final layout as detailed in the planning application drawings. The location of the turbine for the shadow flicker model is also illustrated in following model outputs.
- 11.3.4 The Moneygorm wind turbine types modelled have a hub height of up to 76m and a rotor diameter of up to 56m. These dimensions are consistent with the turbine specification that have been submitted with the planning application and as detailed in the model results below.
- 11.3.5 As the wind energy planning guidelines state at distances of greater than 10 rotor diameters shadow flicker potential becomes negligible. A rotor diameter of 56 metres will have very little potential to cause shadow flicker a distance greater than approximately 560.
- 11.3.6 All dwellings within approximately 2,000m (T01 to H08 distance of 2,137m) of the turbine were included in the assessment. This distance is much greater than the zone of influence, as defined by the Wind Energy Planning Guidelines.
- 11.3.7 Digital terrain data from OSi was incorporated into the model to provide an accurate representation of the surrounding topography. The purpose of this exercise is to identify the 'theoretical' extent and the maximum degree of shadow flicker influence of turbines in terms of the local terrain. This is a theoretical exercise because it is based on topography only and does not allow for intermittent screening provided by, for example, hedgerows, forests or buildings and does not involve the actual height of crests. Thus the shadow flicker assessment, assuming no screening, represents a worse than 'worse-case-scenario' with respect to potential impact within the zone of influence, as defined by the Wind Energy Planning Guidelines, and in terms of the local terrain.

11.3.8 The shadow flicker model results are shown in **Table 11.3** and the detailed results are reproduced in full below.

11.3.9 All of the receptors considered have been assumed to be "Greenhouses". This means that all aspects of each house can experience the flicker effects. This is a very conservative assumption. Often houses will have windows that are oriented so that the flicker occurrence and duration of the flicker event are vastly reduced when compared to the theoretical possibility.

11.3.10 The initial computer model produces worst case scenario estimates in terms of the weather conditions. The following assumptions are made in order to produce this purely theoretical estimate:

- That the sun always shines brightly enough to cast shadows between sunrise and sunset, there is no allowance for rain or overcast conditions;
- the wind speed is always high enough to allow the blades to rotate; and
- the wind turbine always faces the sun and follows the trajectory rather than pointing into the oncoming wind, therefore this maximises the area shadowed by the rotor.

11.3.11 The temperate, changeable weather conditions prevalent in Ireland are not aligned with the initial assumptions made by the model. Thus purely theoretical predictions for the occurrence of shadow flicker will vastly over estimate the number and duration of flicker events. Additional data is required in order to produce a more realistic estimate of the likely shadow flicker occurrences.

11.3.12 In order to take sunshine availability into consideration data specifying daily average sunshine hours has been acquired from the Kilkenny Meteorological Station from Met Eireann. This data has been used in the software model and is shown in **Table 11.1**.

Table 11.1 Daily Average Sunshine Hours

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.68	2.20	3.08	4.72	5.31	4.94	4.67	4.36	3.78	2.74	2.15	1.32

11.3.13 The assumption that the wind turbine will always face directly into the sun is obviously not valid, the wind direction in Ireland can vary, although the prevailing wind is south westerly. The hours of the year (8760) have been divided into twelve directional sectors and this determines the period of time that the wind turbine will be orientated in a particular direction. This data is shown in **Table 11.2** below. There were 372 hours per year where the analysis indicates no wind direction.

Table 11.2 Wind Direction by Sector (hours)

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Total
354	290	332	331	441	908	867	1275	1023	1139	816	612	8388

11.3.14 The estimated annual shadow flicker duration has been calculated based the methodology described above. A summary of the annual durations is presented in **Table 11.3** below. The detailed results and a graphical presentation of the results are included in full below.

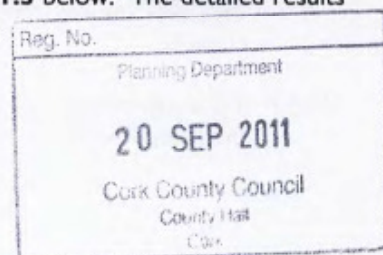


Table I.3 Worst Case Annual Shadow Flicker Occurrence

Receptor	Description	Shadow Flicker Duration for Vestas V52 (hours/year)	Shadow Flicker Duration for Enercon E48 (hours/year)
H01	Dwelling	0:00	0:00
H02	Dwelling	0:00	0:00
H03	Dwelling	0:00	0:00
H04	Dwelling	0:00	0:00
H05	Dwelling	0:00	0:00
H06	Dwelling	0:00	0:00
H07	Dwelling	0:00	0:00
H08	Dwelling	0:00	0:00
H09	Dwelling	0:00	0:00
H10	Dwelling	0:00	0:00
H11	Dwelling	0:00	0:00
H12	Dwelling	0:00	0:00
H13	Dwelling	0:00	0:00
H14	Dwelling	0:20	0:18
H15	Dwelling	0:31	0:28
H16	Dwelling	0:31	0:29
H17	Dwelling	3:47	3:10
H18	Dwelling	0:00	0:00
H19	Dwelling	0:42	0:38
H20	Dwelling	1:15	1:05
H21	Dwelling	0:59	0:52
H22	Dwelling	0:43	0:40
H23	Dwelling	1:23	1:15
H24	Dwelling	0:00	0:00

11.4 MITIGATION MEASURES

- 11.4.1 Considered design of the wind farm and an effort to maximise separation distances from houses where possible to mitigate by avoidance potential impacts is the most effective mitigation method available.
- 11.4.2 As can be seen in the predicted shadow flicker occurrence figures the annual expected duration of flicker events does not exceed the 30 hour limit at any location for the worst case scenario.
- 11.4.3 As can be seen in the predicted shadow flicker occurrence figures the annual expected duration of flicker events is much less than the 30 hour limit at any location for the expected values scenario.
- 11.4.4 While it is relatively straightforward to predict where shadow flicker cannot occur, it is virtually impossible to anticipate exactly when and where it may cause nuisance on a particular day.
- 11.4.5 As a result it is proposed to address complaints regarding shadow flicker impacts by means of the mitigation protocol detailed below.
- 11.4.6 The developer would contact the complainant as soon as possible but no later than 10 working days after the complaint was received to establish when shadow flicker effects were perceived as a nuisance.
- 11.4.7 If the information provided is inconclusive or uncertain, the affected party would be asked to log the date, time and duration of further shadow flicker events occurring on at least 5 different days.

11.4.8 The provided log will be compared with the predicted occurrence of shadow flicker effects. In the event that no agreement is reached, a visit by a representative of the developer would be carried out to verify the occurrence of shadow flicker at the residence.

11.4.9 If occurrence of shadow flicker nuisance could be validated after these steps mitigation options shall be discussed with the affected party. These would initially consider:

- installation of appropriate window blinds in the affected rooms of the residence;
- planting of screening vegetation;
- other site specific measures which might be agreeable to the affected party and may lead to the desired mitigation.

11.4.10 If agreement can be reached according to 11.4.9 then the developer would arrange (and cover the cost) of the required modifications in cooperation with the affected party as soon as practically possible.

11.4.11 If it is not possible to mitigate the problem locally it would be possible to use the wind turbine control system to cease operation of the wind turbine over times of the shadow flicker nuisance. This action would be taken when the particular weather conditions relating to the nuisance events occur, a particular wind speed, direction and direct sunlight present. This method of mitigation has been technically proven at wind farms in areas outside Ireland that experience longer periods of direct sunlight.

11.5 CONCLUSIONS

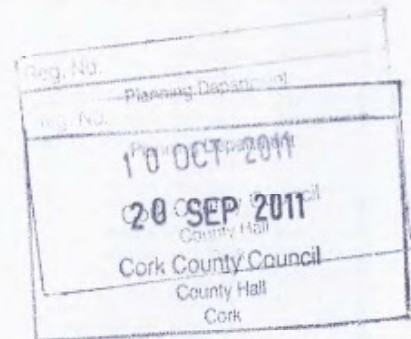
11.5.1 The assessment shows that shadow flicker occurrence will not exceed the limits as detailed in the wind energy planning guidelines at any locations.

11.5.2 If nuisance does occur there are a number of local mitigation measures that can be taken and a proven technical solution through direct control of the wind turbines for avoidance of the impact.

11.5.3 For these reasons the impact of shadow flicker after mitigation from the proposed development is considered to be insignificant.

REFERENCES

- DEHLG (2006). *Wind Energy Planning Guidelines*. Department of Environment, Heritage and Local Government.
- Met Eireann Climate Data, www.met.ie



Project:

Moneygorm Wind Farm

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18/08/2011 09:44:71

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Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Main Result

Calculation: MYGM Shadow Flicker V52

Assumptions for shadow calculations

Maximum distance for influence
Calculate only when more than 20 % of sun is covered by the blade
Please look in WTG table

Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388
Idle start wind speed: Cut in wind speed from power curve

A ZVI (Zones of Visual Influence) calculation is performed before flicker calculation so non visible WTG do not contribute to calculated flicker values. A WTG will be visible if it is visible from any part of the receiver window. The ZVI calculation is based on the following assumptions:

Height contours used: Height Contours: Contour Data.wpo (1)
Obstacles used in calculation
Eye height: 1.5 m
Grid resolution: 10 m



Scale 1:50,000

New WTG

Shadow receptor

WTGs

IG	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM
T01	170,523	92,808	223.2	T01	Yes	VESTAS	V52-850	850	52.0	74.0	917	26.0

Shadow receptor-Input

No.	Name	IG	East	North	Z	Width [m]	Height [m]	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
H02	H02	170,712	91,134	178.4	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H03	H03	170,626	91,163	187.3	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H04	H04	170,436	91,335	205.7	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H05	H05	169,578	90,993	170.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H06	H06	169,544	91,040	170.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H07	H07	169,017	91,364	190.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H08	H08	168,943	91,369	190.3	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H09	H09	169,065	91,525	199.3	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H10	H10	169,559	92,984	278.1	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H11	H11	169,498	92,978	278.2	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H12	H12	169,228	93,050	278.5	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H13	H13	169,124	93,084	277.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H14	H14	169,903	93,002	267.6	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H15	H15	169,970	93,032	265.6	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H16	H16	169,985	93,060	266.9	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H17	H17	170,243	93,071	248.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H18	H18	170,663	93,987	267.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H19	H19	171,193	93,061	237.7	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H20	H20	171,207	92,555	231.3	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H21	H21	171,286	92,482	232.5	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H22	H22	171,343	92,463	235.3	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H23	H23	171,311	92,346	229.1	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	
H24	H24	171,156	92,085	210.0	1.0	1.0	1.0	-180.0	90.0	"Green house mode"	

Project: **Moneygorm Wind Farm**

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18/08/2011 09:43/2.7.486

SHADOW - Main Result

Calculation: MYGM Shadow Flicker V52

Calculation Results

Shadow receptor

No.	Name	Shadow, worst case		Max shadow hours per day [h/day]	Shadow, expected values
		Shadow hours per year [h/year]	Shadow days per year [days/year]		Shadow hours per year [h/year]
H01	H01	0:00	0	0:00	0:00
H02	H02	0:00	0	0:00	0:00
H03	H03	0:00	0	0:00	0:00
H04	H04	0:00	0	0:00	0:00
H05	H05	0:00	0	0:00	0:00
H06	H06	0:00	0	0:00	0:00
H07	H07	0:00	0	0:00	0:00
H08	H08	0:00	0	0:00	0:00
H09	H09	0:00	0	0:00	0:00
H10	H10	0:00	0	0:00	0:00
H11	H11	0:00	0	0:00	0:00
H12	H12	0:00	0	0:00	0:00
H13	H13	0:00	0	0:00	0:00
H14	H14	2:16	18	0:12	0:20
H15	H15	3:39	22	0:16	0:31
H16	H16	3:36	22	0:16	0:31
H17	H17	28:37	68	0:34	3:47
H18	H18	0:00	0	0:00	0:00
H19	H19	4:43	23	0:18	0:42
H20	H20	6:35	29	0:18	1:15
H21	H21	5:10	28	0:16	0:59
H22	H22	3:48	24	0:15	0:43
H23	H23	7:30	45	0:15	1:23
H24	H24	0:00	0	0:00	0:00

Total amount of flickering on the shadow receptors caused by each WTG

No.	Name	Worst case [h/year]	Expected [h/year]
T01	T01	60:05	9:11

Reg. No.
Planning Department
20 SEP 2011
Cork County Council
County Hall
Cork

Project:

Moneygorm Wind Farm

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18/08/2011 09:45:11

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Calculated:

18/08/2011 09:43:27.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H01 - H01

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 808 887 1,275 1,023 1,139 816 812 8,368

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:11 20:07	08:06 20:58	08:21 21:44	08:17 21:58	08:54 21:26	08:44 20:23	07:34 19:14	07:28 17:07	08:19 16:27
2	08:49 16:33	08:14 17:22	07:20 18:14	07:09 20:08	08:04 21:00	08:20 21:45	08:18 21:58	08:56 21:24	08:46 20:21	07:35 19:11	07:30 17:05	08:20 16:26
3	08:43 16:35	08:13 17:24	07:18 18:16	07:07 20:10	08:02 21:01	08:19 21:46	08:19 21:57	08:57 21:23	08:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:42 16:36	08:11 17:26	07:15 18:18	07:04 20:12	08:00 21:03	08:18 21:47	08:20 21:57	08:59 21:21	08:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	08:58 21:05	08:17 21:48	08:20 21:56	08:00 21:19	08:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	08:57 21:06	08:17 21:49	08:21 21:56	08:02 21:17	08:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:41 16:39	08:08 17:32	07:09 18:23	06:57 20:17	08:55 21:08	08:16 21:50	08:22 21:55	08:04 21:15	08:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	06:55 20:19	08:53 21:10	08:16 21:51	08:23 21:55	08:05 21:14	08:56 20:07	07:45 18:58	07:40 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	06:53 20:20	08:51 21:11	08:15 21:52	08:24 21:54	08:07 21:12	08:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:29	06:51 20:22	08:50 21:13	08:15 21:53	08:25 21:53	08:08 21:10	08:59 20:03	07:49 18:53	07:44 16:52	08:31 16:23
11	08:39 16:45	07:59 17:39	07:00 18:30	06:48 20:24	08:48 21:14	08:14 21:53	08:26 21:52	08:10 21:08	07:01 20:00	07:51 18:51	07:46 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:57 18:32	06:46 20:26	08:46 21:16	08:14 21:54	08:27 21:52	08:12 21:06	07:02 19:58	07:52 18:49	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	08:44 21:18	08:14 21:55	08:28 21:51	08:13 21:04	07:04 19:56	07:54 18:48	07:49 16:47	08:34 16:22
14	08:37 16:48	07:53 17:45	06:53 18:36	06:42 20:29	08:43 21:19	08:13 21:55	08:30 21:50	08:15 21:02	07:06 19:53	07:59 18:44	07:51 16:45	08:35 16:22
15	08:36 16:51	07:51 17:47	06:51 18:37	06:39 20:31	08:39 21:21	08:13 21:56	08:31 21:49	08:17 21:00	07:07 19:51	07:58 18:42	07:53 16:44	08:36 16:22
16	08:36 16:53	07:49 17:46	06:48 18:39	06:37 20:32	08:37 21:22	08:13 21:57	08:32 21:48	08:18 20:58	07:09 19:49	07:59 18:40	07:55 16:43	08:37 16:22
17	08:35 16:54	07:47 17:50	06:46 18:41	06:35 20:34	08:38 21:24	08:13 21:57	08:33 21:47	08:20 20:56	07:10 19:46	08:01 18:38	07:56 16:41	08:37 16:23
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	08:33 21:25	08:13 21:57	08:34 21:46	08:21 20:54	07:12 19:44	08:03 18:35	07:58 16:40	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	08:35 21:27	08:13 21:58	08:36 21:44	08:23 20:52	07:14 19:42	08:04 18:33	08:00 16:39	08:39 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:29 20:39	08:34 21:28	08:13 21:58	08:37 21:43	08:25 20:50	07:15 19:39	08:06 18:31	08:02 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	08:33 21:30	08:13 21:58	08:38 21:42	08:26 20:48	07:17 19:37	08:08 18:29	08:03 16:36	08:40 16:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	08:31 21:31	08:14 21:59	08:40 21:41	08:28 20:45	07:19 19:35	08:10 18:27	08:05 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	08:30 21:33	08:14 21:59	08:41 21:39	08:30 20:43	07:20 19:32	08:12 18:25	08:07 16:34	08:41 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	08:29 21:34	08:14 21:59	08:42 21:38	08:31 20:41	07:22 19:30	08:13 18:23	08:08 16:33	08:41 16:25
25	08:26 17:08	07:31 18:05	06:27 18:55	06:18 20:48	08:28 21:35	08:14 21:59	08:44 21:37	08:33 20:39	07:24 19:28	08:15 18:21	08:10 16:32	08:42 16:26
26	08:24 17:10	07:29 18:07	06:25 18:56	06:16 20:49	08:27 21:37	08:15 21:59	08:45 21:35	08:35 20:37	07:25 19:25	08:17 18:19	08:11 16:31	08:42 16:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	08:25 21:38	08:15 21:59	08:47 21:34	08:38 20:35	07:27 19:23	08:19 18:17	08:13 16:30	08:42 16:28
28	08:22 17:13	07:24 18:11	06:20 19:00	06:12 20:53	08:24 21:39	08:16 21:59	08:48 21:32	08:38 20:32	07:29 19:21	08:21 18:15	08:15 16:29	08:43 16:28
29	08:20 17:15	07:18 18:02	06:18 19:02	06:10 20:55	08:23 21:40	08:16 21:58	08:50 21:31	08:39 20:30	07:30 19:18	08:22 18:13	08:16 16:28	08:43 16:29
30	08:19 17:17	07:16 18:03	06:18 19:03	06:10 20:56	08:22 21:42	08:17 21:58	08:51 21:28	08:41 20:28	07:32 19:16	08:24 18:11	08:18 16:27	08:43 16:30
31	08:17 17:19	07:13 18:05	06:15 19:05	06:07 20:57	08:21 21:43	08:18 21:59	08:53 21:26	08:43 20:26	07:26 19:09	08:26 18:09	08:20 16:31	08:43 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project: **Moneygorm Wind Farm**

Printed Page
18/08/2011 09:45 / 2

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H02 - H02

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.68	2.20	3.08	4.72	5.31	4.94	4.67	4.36	3.78	2.74	2.15	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
354	290	332	331	441	908	867	1,275	1,023	1,139	816	612	8,388

Idle in wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:11 20:07	06:06 20:58	05:21 21:44	05:17 21:58	05:54 21:26	06:44 20:23	07:34 19:14	07:29 17:07	08:19 16:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:08 20:06	06:04 21:00	05:20 21:45	05:18 21:58	05:56 21:24	06:46 20:21	07:35 19:11	07:30 17:05	08:20 16:26
3	08:43 16:35	08:13 17:24	07:18 18:16	07:07 20:10	06:02 21:01	05:19 21:46	05:19 21:57	05:57 21:23	06:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:42 16:36	08:11 17:26	07:15 18:18	07:04 20:12	06:00 21:03	05:18 21:47	05:20 21:57	05:59 21:21	06:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	05:17 21:48	05:20 21:56	06:00 21:19	06:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	05:17 21:49	05:21 21:56	06:02 21:17	06:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:41 16:39	08:06 17:32	07:09 18:23	06:57 20:17	05:55 21:08	05:16 21:50	05:22 21:55	06:04 21:15	06:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	06:55 20:19	05:53 21:10	05:16 21:51	05:23 21:55	06:05 21:14	06:56 20:07	07:45 18:58	07:40 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	06:53 20:20	05:51 21:11	05:15 21:52	05:25 21:54	06:07 21:12	06:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:29	06:51 20:22	05:50 21:13	05:15 21:53	05:25 21:53	06:08 21:10	06:59 20:03	07:49 18:53	07:44 16:52	08:31 16:23
11	08:39 16:45	07:59 17:39	07:00 18:30	06:48 20:24	05:48 21:14	05:14 21:53	05:26 21:52	06:10 21:08	07:01 20:00	07:51 18:51	07:46 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:57 18:32	06:46 20:26	05:46 21:16	05:14 21:54	05:27 21:52	06:12 21:06	07:02 19:58	07:52 18:49	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	05:45 21:18	05:14 21:55	05:28 21:51	06:13 21:04	07:04 19:56	07:54 18:46	07:49 16:47	08:34 16:22
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15	08:36 16:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	05:13 21:56	05:31 21:49	06:17 21:00	07:07 19:51	07:58 18:42	07:53 16:44	08:36 16:22
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17	08:35 16:54	07:47 17:50	06:46 18:41	06:35 20:34	05:38 21:24	05:13 21:57	05:33 21:47	06:20 20:56	07:10 19:46	08:01 18:38	07:58 16:41	08:37 16:23
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	05:37 21:25	05:13 21:57	05:34 21:46	06:21 20:54	07:12 19:44	08:03 18:36	07:58 16:40	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	05:35 21:27	05:13 21:58	05:36 21:44	06:23 20:52	07:14 19:42	08:05 18:33	08:00 16:39	08:39 16:22
20	08:32 16:59	07:41 17:56	06:39 18:46	06:29 20:39	05:34 21:28	05:13 21:58	05:37 21:43	06:25 20:50	07:15 19:39	08:06 18:31	08:02 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	05:13 21:58	05:38 21:42	06:26 20:48	07:17 19:37	08:08 18:29	08:03 16:36	08:40 16:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	05:31 21:31	05:14 21:59	05:40 21:41	06:28 20:45	07:19 19:35	08:10 18:27	08:05 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	05:30 21:33	05:14 21:59	05:41 21:39	06:30 20:43	07:20 19:32	08:12 18:25	08:07 16:34	08:41 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	05:14 21:59	05:42 21:38	06:31 20:41	07:22 19:30	08:13 18:23	08:08 16:33	08:41 16:25
25	08:26 17:08	07:31 18:06	06:27 18:55	06:18 20:48	05:28 21:35	05:14 21:59	05:44 21:37	06:33 20:39	07:24 19:29	08:15 18:21	08:10 16:32	08:42 16:26
26	08:24 17:10	07:29 18:07	06:25 18:56	06:16 20:49	05:27 21:37	05:15 21:59	05:45 21:35	06:35 20:37	07:25 19:25	08:17 18:19	08:11 16:31	08:42 16:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	05:25 21:38	05:15 21:59	05:47 21:34	06:36 20:35	07:27 19:23	08:19 18:17	08:13 16:30	08:42 16:28
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29	08:20 17:15	07:18 18:02	06:18 19:02	06:10 20:55	05:23 21:40	05:16 21:58	05:50 21:31	06:39 20:30	07:30 19:18	08:22 18:13	08:16 16:28	08:43 16:29
30	08:19 17:17	07:16 18:03	06:16 19:03	06:08 20:56	05:22 21:42	05:17 21:58	05:51 21:29	06:41 20:28	07:32 19:16	08:24 18:11	08:18 16:27	08:43 16:30
31	08:17 17:19	07:14 18:05	06:14 19:05	06:06 21:43	05:21 21:43	05:16 21:58	05:53 21:28	06:43 20:26	07:36 18:09	08:26 17:09	08:21 16:31	08:43 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:

Moneygorm Wind Farm

Printed/Date

18/08/2011 09:45:13

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H03 - H03

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:18	05:54	06:44	07:34	07:28	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:26	20:23	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	05:20	05:18	05:56	06:46	07:35	07:30	08:20
	16:33	17:22	18:14	20:08	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:42	08:11	07:15	07:04	06:00	05:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:58	05:17	05:20	06:00	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:56	21:19	20:14	19:04	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	05:17	05:21	06:02	06:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
7	08:42	08:06	07:09	06:57	05:55	05:16	05:22	06:04	06:54	07:44	07:39	08:27
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8	08:41	08:04	07:07	06:55	05:53	05:16	05:23	06:05	06:56	07:45	07:40	08:28
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13	08:38	07:55	06:55	06:44	05:45	05:14	05:28	06:13	07:04	07:54	07:49	08:34
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14	08:37	07:53	06:53	06:42	05:43	05:13	05:30	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:29	21:19	21:55	21:50	21:02	19:53	18:44	16:46	16:22
15	08:36	07:51	06:51	06:39	05:41	05:13	05:31	06:17	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:53	17:48	18:39	20:32	21:22	21:57	21:48	20:58	19:49	18:40	16:43	16:22
17	08:35	07:47	06:46	06:35	05:38	05:13	05:33	06:20	07:10	08:01	07:56	08:37
	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:56	19:46	18:38	16:41	16:23
18	08:34	07:45	06:44	06:33	05:37	05:13	05:34	06:21	07:12	08:03	07:58	08:38
	16:56	17:52	18:43	20:36	21:25	21:57	21:46	20:54	19:44	18:36	16:40	16:23
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	16:57	17:54	18:44	20:38	21:27	21:58	21:44	20:52	19:42	18:33	16:39	16:23
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	17:01	17:58	18:48	20:41	21:30	21:58	21:42	20:48	19:37	18:29	16:36	16:24
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	17:04	18:01	18:51	20:44	21:33	21:59	21:39	20:43	19:32	18:25	16:34	16:25
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	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:25
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	17:15	18:13	19:02	20:55	21:40	21:58	21:31	20:30	19:18	18:13	16:28	16:29
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	17:19	18:17	19:06	20:58	21:43	21:58	21:26	20:25	19:13	18:09	16:26	16:31
Potential sun hours	258	277	367	416	466	500	503	454	361	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Moneygorm Wind Farm

Printed Page
18/08/2011 09:45 / 4

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H04 - H04

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
816 612 8.388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:11 20:07	06:06 20:58	05:21 21:44	05:18 21:58	05:54 21:26	06:44 20:23	07:34 19:14	07:28 17:07	08:19 16:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:09 20:08	06:04 21:00	05:20 21:45	05:18 21:58	05:56 21:24	06:46 20:21	07:35 19:11	07:30 17:05	08:20 16:26
3	08:43 16:35	08:13 17:24	07:18 18:16	07:07 20:10	06:02 21:01	05:19 21:46	05:19 21:57	05:57 21:23	06:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:43 16:36	08:11 17:26	07:16 18:18	07:04 20:12	06:00 21:03	05:18 21:47	05:20 21:57	05:59 21:21	06:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	05:17 21:48	05:20 21:56	06:01 21:19	06:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	05:17 21:49	05:21 21:56	06:02 21:17	06:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:42 16:39	08:06 17:32	07:09 18:23	06:57 20:17	05:55 21:08	05:16 21:50	05:22 21:55	06:04 21:15	06:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23
8	08:41 16:41	08:04 17:34	07:07 18:25	06:56 20:19	05:53 21:10	05:16 21:51	05:23 21:55	06:05 21:14	06:56 20:07	07:45 18:58	07:40 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	06:53 20:20	05:51 21:11	05:15 21:52	05:24 21:54	06:07 21:12	06:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:29	06:51 20:22	05:50 21:13	05:15 21:53	05:25 21:53	06:08 21:10	06:59 20:03	07:49 18:53	07:44 16:52	08:31 16:23
11	08:39 16:45	07:59 17:39	07:00 18:30	06:48 20:24	05:48 21:14	05:14 21:53	05:26 21:52	06:10 21:08	07:01 20:01	07:51 18:51	07:46 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:57 18:32	06:46 20:26	05:46 21:16	05:14 21:54	05:27 21:52	06:12 21:06	07:02 19:58	07:52 18:49	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	05:45 21:18	05:14 21:55	05:28 21:51	06:13 21:04	07:04 19:58	07:54 18:46	07:49 16:47	08:34 16:22
14	08:37 16:49	07:53 17:45	06:53 18:36	06:42 20:29	05:43 21:19	05:13 21:55	05:30 21:50	06:15 21:02	07:05 19:54	07:56 18:44	07:51 16:45	08:35 16:22
15	08:37 16:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	05:13 21:56	05:31 21:49	06:17 21:00	07:07 19:51	07:58 18:42	07:53 16:44	08:36 16:22
16	08:36 16:53	07:49 17:48	06:48 18:39	06:37 20:32	05:40 21:22	05:13 21:57	05:32 21:48	06:18 20:58	07:09 19:49	07:59 18:40	07:55 16:43	08:37 16:22
17	08:35 16:54	07:47 17:50	06:46 18:41	06:35 20:34	05:38 21:24	05:13 21:57	05:33 21:47	06:20 20:56	07:11 19:46	08:01 18:38	07:56 16:41	08:37 16:23
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	05:37 21:25	05:13 21:57	05:34 21:46	06:21 20:54	07:12 19:44	08:03 18:36	07:58 16:40	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	05:35 21:27	05:13 21:58	05:36 21:44	06:23 20:52	07:14 19:42	08:05 18:33	08:00 16:39	08:39 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:29 20:39	05:34 21:28	05:13 21:58	05:37 21:43	06:25 20:50	07:15 19:39	08:06 18:31	08:02 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	05:13 21:58	05:38 21:42	06:26 20:48	07:17 19:37	08:08 18:29	08:03 16:36	08:40 16:24
22	08:29 17:03	07:37 18:00	06:34 18:49	06:24 20:43	05:31 21:31	05:14 21:59	05:40 21:41	06:28 20:46	07:19 19:35	08:10 18:27	08:05 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	05:30 21:33	05:14 21:59	05:41 21:39	06:30 20:43	07:20 19:32	08:12 18:25	08:07 16:34	08:42 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	05:14 21:59	05:42 21:38	06:31 20:41	07:22 19:30	08:13 18:23	08:08 16:33	08:42 16:25
25	08:26 17:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	05:14 21:59	05:44 21:37	06:33 20:39	07:24 19:26	08:14 17:21	08:10 16:32	08:42 16:26
26	08:24 17:10	07:29 18:07	06:25 18:56	06:16 20:49	05:27 21:37	05:15 21:59	05:45 21:35	06:35 20:37	07:25 19:25	08:17 17:19	08:11 16:31	08:42 16:27
27	08:23 17:11	07:28 18:09	06:23 18:58	06:14 20:51	05:26 21:38	05:16 21:59	05:47 21:34	06:36 20:35	07:27 19:23	08:19 17:17	08:13 16:30	08:42 16:28
28	08:22 17:13	07:24 18:11	06:20 19:00	06:12 20:53	05:24 21:39	05:16 21:59	05:48 21:32	06:38 20:32	07:29 19:21	08:21 17:15	08:15 16:29	08:43 16:28
29	08:20 17:15	07:18 20:02	06:18 20:55	06:10 21:40	05:23 21:59	05:16 21:59	05:50 21:31	06:39 20:30	07:30 19:18	08:22 17:13	08:16 16:29	08:43 16:29
30	08:19 17:17	07:16 20:03	06:08 20:56	06:02 21:42	05:22 21:58	05:17 21:58	05:51 21:29	06:41 20:28	07:32 19:16	08:24 17:11	08:18 16:27	08:43 16:30
31	08:17 17:19	07:13 20:05	06:04 20:51	06:01 21:43	05:21 21:58	05:17 21:58	05:53 21:28	06:43 20:26	07:26 17:09	08:26 17:09	08:43 16:31	08:43 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

No. _____
Planning Department
20 SEP 2011
Cork County Council
County Hall
Cork

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project:
Moneygorm Wind Farm

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 18/08/2011 09:45 / 5

Licensed user:
Wind Prospect Limited
 7, Berkeley Square, Clifton
 GB-B58 1HG Bristol
 +44 0117 910 5980

Calculated:
 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H05 - H05

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
 Minimum sun height over horizon for influence 3 °
 Day step for calculation 1 days
 Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388
 Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:18	05:54	06:44	07:34	07:28	08:19
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	16:38	17:30	18:21	20:15	21:06	21:49	21:58	21:17	20:12	19:02	16:58	16:24
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10	08:40	08:01	07:02	06:51	05:50	05:15	05:25	06:09	06:59	07:49	07:44	08:31
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13	08:38	07:55	06:55	06:44	05:45	05:14	05:28	06:13	07:04	07:54	07:49	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:46	16:47	16:22
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16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
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21	08:31	07:39	06:37	06:26	05:33	05:13	05:38	06:26	07:17	08:08	08:03	08:40
	17:01	17:58	18:48	20:41	21:30	21:59	21:42	20:49	19:37	18:29	16:36	16:24
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	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:26
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	17:15	18:13	19:02	20:55	21:41	21:59	21:31	20:30	19:18	18:13	16:28	16:29
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Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Moneygorm Wind Farm

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18/08/2011 09:45 / 6

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H06 - H06

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

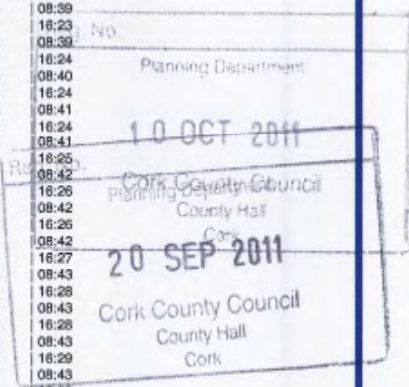
Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 200 332 331 441 908 867 1,275 1,023 1,130 816 612 8,398
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:18	05:54	06:44	07:34	07:28	08:19
	16:32	17:21	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
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	16:37	17:28	18:20	20:14	21:05	21:48	21:56	21:19	20:14	19:05	17:00	16:24
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	16:41	17:34	18:25	20:19	21:10	21:51	21:55	21:14	20:08	18:58	16:55	16:23
9	08:41	08:02	07:04	06:53	05:51	05:15	05:24	06:07	06:57	07:47	07:42	08:30
	16:42	17:35	18:27	20:20	21:11	21:52	21:54	21:12	20:05	18:55	16:53	16:23
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	16:44	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:39	07:59	07:00	06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
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13	08:39	07:55	06:55	06:44	05:45	05:14	05:28	06:13	07:04	07:54	07:49	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:46	16:47	16:22
14	08:37	07:53	06:53	06:42	05:43	05:14	05:30	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:29	21:19	21:55	21:50	21:02	19:54	18:44	16:46	16:22
15	08:37	07:51	06:51	06:39	05:41	05:13	05:31	06:17	07:07	07:58	07:53	08:36
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16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:53	17:49	18:39	20:32	21:22	21:57	21:48	20:58	19:49	18:40	16:43	16:22
17	08:35	07:47	06:46	06:35	05:38	05:13	05:33	06:20	07:11	08:01	07:56	08:37
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18	08:34	07:45	06:44	06:33	05:37	05:13	05:34	06:21	07:12	08:03	07:58	08:38
	16:56	17:52	18:43	20:36	21:25	21:57	21:46	20:54	19:44	18:36	16:40	16:23
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	16:59	17:56	18:46	20:39	21:28	21:58	21:43	20:50	19:39	18:31	16:37	16:24
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	17:04	18:01	18:51	20:44	21:33	21:59	21:39	20:43	19:32	18:25	16:34	16:25
24	08:27	07:33	06:30	06:20	05:29	05:14	05:43	06:31	07:22	08:13	08:08	08:42
	17:06	18:03	18:53	20:46	21:34	21:59	21:58	20:41	19:30	18:23	16:33	16:26
25	08:26	07:31	06:27	06:18	05:28	05:14	05:44	06:33	07:24	08:15	08:10	08:42
	17:08	18:05	18:55	20:48	21:35	21:59	21:37	20:39	19:28	18:21	16:32	16:26
26	08:25	07:29	06:25	06:16	05:27	05:15	05:45	06:35	07:25	08:17	08:11	08:42
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27	08:23	07:26	06:23	06:14	05:25	05:15	05:47	06:36	07:27	08:19	08:13	08:43
	17:11	18:09	18:58	20:51	21:38	21:59	21:34	20:35	19:23	18:17	16:30	16:28
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	17:13	18:11	19:00	20:53	21:39	21:59	21:32	20:32	19:21	18:15	17:15	16:29
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	17:15		20:02	20:55	21:41	21:59	21:31	20:30	19:18	18:13	17:13	16:28
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	17:17		20:03	20:56	21:42	21:58	21:29	20:28	19:16	18:11	17:11	16:27
31	08:17		07:14		05:21		05:55	06:40		07:30	08:20	08:40
	17:19		20:05		21:43		21:28	20:26		17:09	16:31	16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	286	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)



Project:
Moneygorm Wind Farm

Printed Page:
18/08/2011 09:45, 7

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-B8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H07 - H07

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 6,365
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:18	05:54	06:44	07:34	07:28	08:19
	16:32	17:21	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	05:20	05:18	05:56	06:46	07:35	07:30	08:21
	16:34	17:22	18:14	20:09	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	05:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:59	05:18	05:21	06:01	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:56	21:19	20:14	19:05	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	05:17	05:21	06:02	06:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
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	16:41	17:34	18:25	20:19	21:10	21:51	21:55	21:14	20:08	18:58	16:55	16:23
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	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
12	08:39	07:57	06:58	06:46	05:46	05:14	05:27	06:12	07:02	07:52	07:48	08:33
	16:46	17:41	18:32	20:26	21:16	21:54	21:52	21:06	19:58	18:49	16:49	16:22
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	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:47	16:47	16:22
14	08:37	07:53	06:53	06:42	05:43	05:14	05:30	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:28	21:19	21:56	21:50	21:02	19:54	18:44	16:46	16:22
15	08:37	07:51	06:51	06:40	05:41	05:13	05:31	06:17	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
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	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:56	19:47	18:38	16:41	16:23
18	08:34	07:45	06:44	06:33	05:37	05:13	05:34	06:22	07:12	08:03	07:58	08:38
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19	08:33	07:43	06:41	06:31	05:36	05:13	05:36	06:23	07:14	08:05	08:00	08:39
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	17:01	17:58	18:48	20:41	21:30	21:58	21:42	20:48	19:37	18:29	16:36	16:24
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	17:03	18:00	18:50	20:43	21:31	21:59	21:41	20:46	19:35	18:27	16:35	16:24
23	08:29	07:35	06:32	06:22	05:30	05:14	05:41	06:30	07:20	08:12	08:07	08:41
	17:04	18:02	18:51	20:44	21:33	21:59	21:39	20:43	19:32	18:25	16:34	16:25
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	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:26
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	17:10	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:25	18:19	16:31	16:27
27	08:23	07:27	06:23	06:14	05:25	05:15	05:47	06:36	07:27	08:19	08:13	08:43
	17:11	18:09	18:58	20:51	21:38	21:59	21:34	20:35	19:23	18:17	16:30	16:28
28	08:22	07:24	06:20	06:12	05:24	05:16	05:48	06:38	07:29	08:21	08:15	08:43
	17:13	18:11	19:00	20:53	21:39	21:59	21:32	20:33	19:21	18:15	16:29	16:28
29	08:20	07:18	06:10	06:03	05:16	05:16	05:50	06:40	07:30	08:22	08:16	08:43
	17:15	18:13	19:02	20:55	21:41	21:59	21:31	20:30	19:18	18:13	16:28	16:29
30	08:19	07:16	06:08	06:02	05:17	05:17	05:51	06:41	07:32	08:24	08:18	08:43
	17:17	18:15	19:04	20:56	21:42	21:58	21:29	20:28	19:16	18:11	16:27	16:30
31	08:17	07:14	06:06	06:00	05:18	05:18	05:53	06:43	07:34	08:26	08:20	08:43
	17:19	18:17	19:06	20:58	21:43	21:58	21:26	20:26	19:14	18:09	16:26	16:31
Potential sun hours	258	277	367	416	486	500	503	454	361	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45 / 8

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H08 - H08

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,199 816 612 8,988
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 18:32	08:16 17:24	07:22 18:12	07:11 20:07	06:06 20:58	05:21 21:44	05:18 21:58	05:54 21:26	06:44 20:24	07:34 19:14	07:28 17:07	08:19 16:27
2	08:43 18:34	08:14 17:22	07:20 18:14	07:09 20:09	06:04 21:00	05:20 21:45	05:18 21:58	05:56 21:24	06:46 20:21	07:35 19:11	07:30 17:05	08:21 16:26
3	08:43 18:35	08:13 17:24	07:18 18:16	07:07 20:10	06:02 21:01	05:19 21:46	05:19 21:57	05:57 21:23	06:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:43 18:36	08:11 17:26	07:16 18:18	07:04 20:12	06:00 21:03	05:18 21:47	05:20 21:57	05:59 21:21	06:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 18:37	08:09 17:28	07:13 18:20	07:02 20:14	05:59 21:05	05:18 21:48	05:21 21:57	06:01 21:19	06:51 20:14	07:40 19:05	07:35 17:00	08:25 16:24
6	08:42 18:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	05:17 21:49	05:21 21:56	06:02 21:17	06:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
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12	08:39 18:46	07:57 17:41	06:58 18:32	06:46 20:26	05:46 21:16	05:14 21:54	05:27 21:52	06:12 21:06	07:02 19:58	07:52 18:49	07:48 16:49	08:33 16:22
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16	08:36 18:53	07:49 17:49	06:48 18:39	06:37 20:33	05:40 21:22	05:13 21:57	05:32 21:48	06:18 20:58	07:09 19:49	07:59 18:40	07:55 16:43	08:37 16:22
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19	08:33 18:57	07:43 17:54	06:41 18:44	06:31 20:38	05:36 21:27	05:13 21:58	05:36 21:45	06:23 20:52	07:14 19:42	08:05 18:33	08:00 16:39	08:39 16:23
20	08:32 18:59	07:41 17:56	06:39 18:46	06:29 20:39	05:34 21:28	05:13 21:58	05:37 21:43	06:25 20:50	07:16 19:40	08:06 18:31	08:02 16:37	08:40 16:24
21	08:31 19:01	07:39 17:58	06:37 18:48	06:27 20:41	05:33 21:30	05:13 21:58	05:38 21:42	06:26 20:48	07:17 19:37	08:08 18:29	08:03 16:36	08:40 16:24
22	08:30 19:03	07:37 18:00	06:34 18:50	06:24 20:43	05:31 21:31	05:14 21:59	05:40 21:41	06:28 20:46	07:19 19:35	08:10 18:27	08:05 16:35	08:41 16:24
23	08:28 19:04	07:35 18:03	06:32 18:52	06:22 20:44	05:30 21:33	05:14 21:59	05:41 21:43	06:30 20:43	07:20 19:32	08:12 18:25	08:07 16:34	08:41 16:25
24	08:27 19:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	05:14 21:59	05:43 21:38	06:31 20:41	07:22 19:30	08:13 18:23	08:08 16:33	08:42 16:26
25	08:26 19:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	05:14 21:59	05:44 21:37	06:33 20:39	07:24 19:28	07:15 18:21	08:10 16:32	08:42 16:26
26	08:25 19:10	07:29 18:07	06:25 18:56	06:16 20:50	05:27 21:37	05:15 21:59	05:45 21:35	06:35 20:37	07:25 19:25	07:17 18:19	08:12 16:31	08:42 16:27
27	08:23 19:11	07:27 18:09	06:23 18:58	06:14 20:51	05:25 21:38	05:15 21:59	05:47 21:34	06:36 20:35	07:27 19:23	07:19 18:17	08:13 16:30	08:43 16:28
28	08:22 19:13	07:24 18:11	06:21 19:00	06:12 20:53	05:24 21:39	05:16 21:59	05:48 21:32	06:38 20:33	07:29 19:21	07:21 18:15	08:15 16:29	08:43 16:28
29	08:20 19:15	07:18 18:02	06:18 19:00	06:10 20:55	05:23 21:41	05:16 21:59	05:50 21:31	06:40 20:30	07:30 19:18	07:22 18:13	08:16 16:28	08:43 16:29
30	08:19 19:17	07:16 18:03	06:08 19:03	06:08 20:56	05:22 21:42	05:17 21:58	05:51 21:29	06:41 20:28	07:32 19:16	07:24 18:11	08:18 16:27	08:43 16:30
31	08:17 19:19	07:14 18:05	06:07 19:05	06:07 21:43	05:21 21:43	05:16 21:58	05:53 21:28	06:43 20:26	07:33 19:09	07:25 18:08	08:19 16:31	08:43 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45:09

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-B8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H09 - H09

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 616 612 8,368
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:18	05:54	06:44	07:34	07:28	08:19
	16:32	17:21	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	05:20	05:18	05:56	06:46	07:35	07:30	08:21
	16:34	17:22	18:14	20:09	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	05:16	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:59	05:16	05:21	06:01	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:57	21:19	20:14	19:05	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	05:17	05:21	06:02	06:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
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	16:42	17:35	18:27	20:21	21:11	21:52	21:54	21:12	20:05	18:55	16:53	16:23
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	16:44	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:40	07:59	07:00	06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
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	16:49	17:46	18:36	20:29	21:19	21:56	21:50	21:02	19:54	18:44	16:46	16:22
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	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
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	16:56	17:52	18:43	20:36	21:26	21:57	21:46	20:54	19:44	18:36	16:40	16:23
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	16:59	17:56	18:46	20:39	21:28	21:59	21:43	20:50	19:40	18:31	16:37	16:24
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	17:04	18:02	18:51	20:44	21:33	21:59	21:39	20:43	19:32	18:25	16:34	16:25
24	08:27	07:33	06:30	06:20	05:29	05:14	05:43	06:31	07:22	08:13	08:08	08:42
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	17:10	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:25	18:19	16:31	16:27
27	08:23	07:27	06:23	06:14	05:25	05:15	05:47	06:36	07:27	08:19	08:13	08:43
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30	08:19		07:16	06:08	05:22	05:17	05:51	06:41	07:32	08:24	08:18	08:43
	17:17		20:03	20:56	21:42	21:58	21:29	20:28	19:16	18:11	16:27	16:30
31	08:17		07:14		05:21		05:53	06:43		07:26		08:43
	17:19		20:05		21:43		21:28	20:26		17:09		16:31
Potential sun hours	258	277	367	416	466	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45 / 10

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H10 - H10

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,199 816 612 8,388
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:20	05:17	05:54	06:44	07:34	07:28	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	05:20	05:18	05:56	06:46	07:35	07:30	08:21
	16:33	17:22	18:14	20:08	21:00	21:46	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	05:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:58	05:17	05:20	06:00	06:51	07:40	07:35	08:25
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	16:43	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:40	07:59	07:00	06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
12	08:39	07:57	06:58	06:46	05:46	05:14	05:27	06:12	07:02	07:52	07:48	08:33
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	16:49	17:46	18:36	20:29	21:19	21:56	21:50	21:02	19:54	18:44	16:46	16:22
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	17:15		20:02	20:56	21:41	21:59	21:31	20:30	19:18	17:13	16:28	16:29
30	08:19		07:16	06:08	05:22	05:17	05:51	06:41	07:32	07:24	08:18	08:43
	17:17		20:03	20:56	21:42	21:58	21:29	20:28	19:16	17:11	16:27	16:30
31	06:17		07:14		05:21		05:53	06:43		07:26		08:43
	17:19		20:05		21:45		21:28	20:26		17:09		16:31
Potential sun hours	258	277	367	416	486	500	503	454	361	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

RECEIVED
Planning Department
20 SEP 2011
Cork County Council
County Hall
Cork

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project:
Moneygorm Wind Farm

Printed/Page
18/08/2011 09:45 r1

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H11 - H11

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	06:20	05:17	05:54	06:44	07:34	07:26	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	06:20	05:16	05:56	06:46	07:35	07:30	08:21
	16:33	17:22	18:14	20:08	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	06:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	06:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:58	06:17	05:20	06:01	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:57	21:19	20:14	19:05	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	06:17	05:21	06:02	06:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:56	16:24
7	08:42	08:06	07:09	06:57	05:55	06:16	05:22	06:04	06:54	07:44	07:39	08:27
	16:39	17:32	18:23	20:17	21:08	21:50	21:55	21:16	20:10	19:00	16:57	16:23
8	08:41	08:04	07:07	06:55	05:53	06:16	05:23	06:05	06:56	07:46	07:41	08:28
	16:41	17:34	18:25	20:19	21:10	21:51	21:55	21:14	20:08	18:58	16:55	16:23
9	08:41	08:02	07:04	06:53	05:51	06:15	05:24	06:07	06:57	07:47	07:42	08:30
	16:42	17:35	18:27	20:21	21:11	21:52	21:54	21:12	20:05	18:55	16:53	16:23
10	08:40	08:01	07:02	06:51	05:50	06:15	05:25	06:08	06:59	07:49	07:44	08:31
	16:43	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:40	07:59	07:00	06:48	05:48	06:14	05:26	06:10	07:01	07:51	07:46	08:32
	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
12	08:39	07:57	06:58	06:46	05:46	06:14	05:27	06:12	07:02	07:52	07:48	08:33
	16:46	17:41	18:32	20:26	21:16	21:54	21:52	21:06	19:58	18:49	16:48	16:22
13	08:38	07:55	06:55	06:44	05:45	06:14	05:28	06:13	07:04	07:54	07:49	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:46	16:47	16:22
14	08:37	07:53	06:53	06:42	05:43	06:13	05:29	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:29	21:19	21:56	21:50	21:02	19:54	18:44	16:45	16:22
15	08:37	07:51	06:51	06:39	05:41	06:13	05:31	06:17	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	05:40	06:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:53	17:49	18:39	20:33	21:22	21:57	21:48	20:56	19:49	18:40	16:43	16:22
17	08:35	07:47	06:46	06:35	05:38	06:13	05:33	06:20	07:11	08:01	07:57	08:37
	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:56	19:47	18:38	16:41	16:23
18	08:34	07:45	06:44	06:33	05:37	06:13	05:34	06:21	07:12	08:03	07:58	08:38
	16:56	17:52	18:43	20:36	21:25	21:58	21:46	20:54	19:44	18:35	16:40	16:23
19	08:33	07:43	06:41	06:31	05:35	06:13	05:36	06:23	07:14	08:05	08:00	08:39
	16:57	17:54	18:44	20:38	21:27	21:59	21:45	20:52	19:42	18:33	16:39	16:23
20	08:32	07:41	06:39	06:29	05:34	06:13	05:37	06:25	07:15	08:06	08:02	08:40
	16:59	17:56	18:46	20:39	21:28	21:58	21:43	20:50	19:39	18:31	16:37	16:23
21	08:31	07:39	06:37	06:26	05:33	06:13	05:38	06:26	07:17	08:08	08:03	08:40
	17:01	17:58	18:48	20:41	21:30	21:58	21:42	20:48	19:37	18:29	16:36	16:24
22	08:30	07:37	06:34	06:24	05:31	06:14	06:40	06:28	07:19	08:10	08:05	08:41
	17:02	18:00	18:50	20:43	21:31	21:59	21:41	20:46	19:35	18:27	16:35	16:24
23	08:28	07:35	06:32	06:22	05:30	06:14	06:41	06:30	07:20	08:12	08:07	08:41
	17:04	18:01	18:51	20:44	21:33	21:59	21:40	20:43	19:32	18:25	16:34	16:25
24	08:27	07:33	06:30	06:20	05:29	06:14	06:42	06:31	07:22	08:13	08:08	08:42
	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:25
25	08:26	07:31	06:27	06:18	05:28	06:14	06:44	06:33	07:24	08:15	08:10	08:42
	17:08	18:05	18:55	20:48	21:35	21:59	21:37	20:39	19:28	18:21	16:32	16:26
26	08:25	07:29	06:25	06:16	05:27	06:15	06:45	06:35	07:25	08:17	08:12	08:42
	17:10	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:25	18:19	16:31	16:27
27	08:23	07:27	06:23	06:14	05:25	06:15	06:47	06:36	07:27	08:19	08:13	08:43
	17:11	18:09	18:58	20:51	21:38	21:59	21:34	20:35	19:23	18:17	16:30	16:28
28	08:22	07:24	06:20	06:12	05:24	06:16	06:48	06:38	07:29	08:21	08:15	08:43
	17:13	18:11	19:00	20:53	21:39	21:59	21:32	20:33	19:21	18:15	16:29	16:28
29	08:20		07:18	06:10	05:23	06:16	06:50	06:39	07:30	08:22	08:16	08:43
	17:15		20:02	20:55	21:41	21:59	21:31	20:30	19:18	18:13	16:28	16:29
30	08:19		07:16	06:08	05:22	06:17	06:51	06:41	07:32	08:24	08:18	08:43
	17:17		20:03	20:56	21:42	21:58	21:29	20:28	19:16	18:11	16:27	16:30
31	08:17		07:14		05:21		06:53	06:43		07:26		08:43
	17:19		20:05		21:43		21:28	20:26		17:09		16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	286	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Minutes with flicker	Last time (hh:mm) with flicker
			(WTG causing flicker last time)

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45 / 12

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H12 - H12

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,900

Idle start wind speed: Cut In wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	08:06	05:21	05:17	05:54	08:44	07:34	07:28	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	08:04	05:20	05:18	05:56	08:46	07:35	07:30	08:21
	16:33	17:22	18:14	20:09	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	08:02	05:19	05:19	05:57	08:48	07:37	07:32	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	08:00	05:18	05:20	05:59	08:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	08:58	05:17	05:20	06:01	08:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:57	21:19	20:14	19:05	17:00	16:24
6	08:42	08:08	07:11	07:00	08:57	05:17	05:21	06:02	08:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
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	16:39	17:32	18:23	20:17	21:08	21:50	21:55	21:16	20:10	19:00	16:57	16:23
8	08:41	08:04	07:07	06:55	08:53	05:16	05:23	06:05	08:56	07:46	07:41	08:29
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10	08:40	08:01	07:02	06:51	08:50	05:15	05:25	06:08	08:59	07:49	07:44	08:31
	16:43	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:40	07:59	07:00	06:48	08:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
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	16:46	17:41	18:32	20:26	21:16	21:54	21:52	21:06	19:58	18:49	16:48	16:22
13	08:38	07:55	06:55	06:44	08:45	05:14	05:28	06:13	07:04	07:54	07:49	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:58	18:46	16:47	16:22
14	08:37	07:53	06:53	06:42	08:43	05:13	05:30	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:29	21:19	21:56	21:50	21:02	19:54	18:44	16:46	16:22
15	08:37	07:51	06:51	06:39	08:41	05:13	05:31	06:17	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	08:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:53	17:49	18:39	20:33	21:22	21:57	21:48	20:58	19:49	18:40	16:43	16:22
17	08:35	07:47	06:46	06:35	08:38	05:13	05:33	06:20	07:11	08:01	07:57	08:37
	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:58	19:47	18:38	16:41	16:23
18	08:34	07:45	06:44	06:33	08:37	05:13	05:34	06:21	07:12	08:03	07:58	08:38
	16:56	17:52	18:43	20:36	21:25	21:58	21:46	20:54	19:44	18:36	16:40	16:23
19	08:33	07:43	06:41	06:31	08:35	05:13	05:36	06:23	07:14	08:05	08:00	08:39
	16:57	17:54	18:44	20:38	21:27	21:58	21:45	20:52	19:42	18:33	16:39	16:23
20	08:32	07:41	06:39	06:29	08:34	05:13	05:37	06:25	07:15	08:06	08:02	08:40
	16:59	17:56	18:46	20:39	21:28	21:58	21:43	20:50	19:39	18:31	16:37	16:23
21	08:31	07:39	06:37	06:26	08:33	05:13	05:38	06:26	07:17	08:08	08:03	08:40
	17:01	17:58	18:48	20:41	21:30	21:59	21:42	20:48	19:37	18:29	16:36	16:24
22	08:30	07:37	06:34	06:24	08:31	05:14	05:40	06:28	07:19	08:10	08:05	08:41
	17:03	18:00	18:50	20:43	21:31	21:59	21:41	20:46	19:35	18:27	16:36	16:24
23	08:28	07:35	06:32	06:22	08:30	05:14	05:41	06:30	07:20	08:12	08:07	08:41
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24	08:27	07:33	06:30	06:20	08:29	05:14	05:42	06:31	07:22	08:13	08:08	08:42
	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:25
25	08:26	07:31	06:27	06:18	08:28	05:14	05:44	06:33	07:24	07:15	08:10	08:42
	17:08	18:05	18:55	20:48	21:35	21:59	21:37	20:39	19:28	17:21	16:32	16:26
26	08:25	07:29	06:25	06:16	08:27	05:15	05:45	06:35	07:25	07:17	08:12	08:42
	17:10	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:25	17:19	16:31	16:27
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29	08:20		07:18	06:10	08:23	05:16	05:50	06:39	07:30	07:22	08:16	08:43
	17:15		20:02	20:55	21:41	21:59	21:31	20:30	19:18	17:13	16:28	16:29
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31	08:17		07:14		08:21		08:53	06:43		07:26		08:43
	17:19		20:05		21:43		21:26	20:26		17:09		16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Req. No.
Planning Department
10 OCT 2011
Cork County Council
County Hall
Cork

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker (WTG causing flicker first time)
Sun set (hh:mm) Minutes with flicker Last time (hh:mm) with flicker (WTG causing flicker last time)

Project:

Moneygorn Wind Farm

Printed/Date

18/08/2011 09:45 / 13

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H13 - H13

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.68	2.20	3.08	4.72	5.31	4.94	4.67	4.36	3.78	2.74	2.15	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
354	290	332	331	441	908	867	1,275	1,023	1,139	816	612	8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:21	05:17	05:54	06:44	07:34	07:28	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:26	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	06:04	05:20	05:18	05:56	06:46	07:35	07:30	08:21
	16:33	17:22	18:14	20:09	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:32	08:22
	16:35	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	05:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:59	05:17	05:20	06:01	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:57	21:19	20:14	19:05	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	05:17	05:21	06:02	06:53	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
7	08:42	08:06	07:09	06:57	05:55	05:16	05:22	06:04	06:54	07:44	07:39	08:27
	16:39	17:32	18:23	20:17	21:08	21:50	21:55	21:16	20:10	19:00	16:57	16:23
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	16:41	17:34	18:25	20:19	21:10	21:51	21:55	21:14	20:08	18:58	16:55	16:23
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	16:42	17:35	18:27	20:21	21:11	21:52	21:54	21:12	20:05	18:55	16:53	16:23
10	08:40	08:01	07:02	06:51	05:50	05:15	05:25	06:08	06:59	07:49	07:44	08:31
	16:43	17:37	18:29	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:52	16:23
11	08:40	07:59	07:00	06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
12	08:39	07:57	06:58	06:46	05:46	05:14	05:27	06:12	07:02	07:52	07:48	08:33
	16:46	17:41	18:32	20:26	21:16	21:54	21:52	21:06	19:58	18:49	16:48	16:22
13	08:38	07:55	06:55	06:44	05:45	05:14	05:28	06:13	07:04	07:54	07:50	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:46	16:47	16:22
14	08:37	07:53	06:53	06:42	05:43	05:13	05:30	06:15	07:06	07:56	07:51	08:35
	16:49	17:45	18:36	20:29	21:19	21:56	21:50	21:02	19:54	18:44	16:45	16:22
15	08:37	07:51	06:51	06:39	05:41	05:13	05:31	06:17	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:56	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:53	17:49	18:39	20:33	21:22	21:57	21:48	20:58	19:49	18:40	16:43	16:22
17	08:35	07:47	06:46	06:35	05:36	05:13	05:33	06:20	07:11	08:01	07:57	08:38
	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:56	19:47	18:38	16:41	16:23
18	08:34	07:45	06:44	06:33	05:37	05:13	05:34	06:21	07:12	08:03	07:59	08:38
	16:56	17:52	18:43	20:36	21:26	21:58	21:46	20:54	19:44	18:35	16:40	16:23
19	08:33	07:43	06:41	06:31	05:35	05:13	05:36	06:23	07:14	08:05	08:00	08:39
	16:57	17:54	18:44	20:38	21:27	21:58	21:45	20:52	19:42	18:33	16:39	16:23
20	08:32	07:41	06:39	06:29	05:34	05:13	05:37	06:25	07:15	08:06	08:02	08:40
	16:59	17:56	18:46	20:39	21:28	21:59	21:43	20:50	19:40	18:31	16:37	16:23
21	08:31	07:39	06:37	06:26	05:33	05:13	05:38	06:26	07:17	08:08	08:03	08:40
	17:01	17:58	18:48	20:41	21:30	21:59	21:42	20:48	19:37	18:29	16:36	16:24
22	08:30	07:37	06:34	06:24	05:31	05:14	05:40	06:28	07:19	08:10	08:05	08:41
	17:03	18:00	18:50	20:43	21:31	21:59	21:41	20:46	19:35	18:27	16:35	16:24
23	08:28	07:35	06:32	06:22	05:30	05:14	05:41	06:30	07:20	08:12	08:07	08:41
	17:04	18:01	18:51	20:45	21:33	21:59	21:40	20:43	19:32	18:25	16:34	16:25
24	08:27	07:33	06:30	06:20	05:29	05:14	05:42	06:31	07:22	08:13	08:08	08:42
	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:25
25	08:26	07:31	06:27	06:18	05:28	05:14	05:44	06:33	07:24	08:15	08:10	08:42
	17:08	18:05	18:55	20:48	21:35	21:59	21:37	20:39	19:28	18:21	16:32	16:26
26	08:25	07:29	06:25	06:16	05:27	05:15	05:45	06:35	07:25	08:17	08:12	08:42
	17:10	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:26	18:19	16:31	16:27
27	08:23	07:27	06:23	06:14	05:25	05:15	05:47	06:36	07:27	08:19	08:13	08:43
	17:11	18:09	18:58	20:51	21:38	21:59	21:34	20:35	19:23	18:17	16:30	16:28
28	08:22	07:24	06:20	06:12	05:24	05:16	05:48	06:38	07:29	08:21	08:15	08:43
	17:13	18:11	19:00	20:53	21:39	21:59	21:32	20:33	19:21	18:15	16:29	16:28
29	08:20		07:18	06:10	05:23	05:16	05:50	06:39	07:30	08:22	08:16	08:43
	17:15		20:02	20:55	21:41	21:59	21:31	20:30	19:18	18:13	16:28	16:29
30	08:19		07:16	06:08	05:22	05:17	05:51	06:41	07:32	08:24	08:18	08:43
	17:17		20:03	20:56	21:42	21:58	21:29	20:28	19:16	18:11	16:27	16:30
31	08:17		07:14		05:21		05:53	06:43		07:26		08:43
	17:19		20:05		21:43		21:28	20:26		17:09		16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45 / 14

Licensee user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H14 - H14

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 408 467 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:46 (T01) 20:07	07:11 20:58	06:06 21:44	05:20 21:58	05:17 21:26	05:54 20:24	07:34 19:14	07:28 17:07	08:19 16:27
2	08:43 15:33	08:14 17:22	07:20 18:14	07:44 (T01) 20:08	07:09 21:00	06:04 21:45	05:20 21:58	05:18 21:24	05:56 20:21	07:36 19:11	07:30 17:05	08:21 16:28
3	08:43 16:34	08:13 17:24	07:18 18:16	07:41 (T01) 20:07	07:07 21:01	06:02 21:46	05:19 21:57	05:19 21:23	05:57 20:18	07:37 19:06	07:31 17:04	08:22 16:25
4	08:43 16:36	08:11 17:26	07:16 18:18	07:40 (T01) 20:12	07:04 21:03	06:00 21:47	05:18 21:57	05:20 21:21	05:59 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:44 (T01) 20:14	07:02 21:05	05:58 21:48	05:17 21:57	05:20 21:19	05:51 20:14	07:40 19:05	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:48 (T01) 20:15	07:00 21:06	05:57 21:48	05:21 21:56	05:22 21:17	05:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:42 16:39	08:06 17:32	07:09 18:23	07:48 (T01) 20:17	06:57 21:08	05:55 21:50	05:22 21:55	05:24 21:18	05:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	07:48 (T01) 20:19	06:55 21:10	05:53 21:51	05:23 21:55	05:25 21:14	05:56 20:08	07:46 18:58	07:41 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	07:48 (T01) 20:20	06:53 21:11	05:51 21:52	05:24 21:54	05:27 21:12	05:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:28	07:48 (T01) 20:22	06:51 21:13	05:50 21:53	05:25 21:53	05:29 21:10	05:59 20:03	07:49 18:53	07:44 16:52	08:31 16:23
11	08:40 16:45	07:59 17:39	07:00 18:30	07:48 (T01) 20:24	06:49 21:15	05:49 21:54	05:26 21:53	05:31 21:08	06:01 20:01	07:51 18:51	07:48 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:58 18:32	07:48 (T01) 20:26	06:48 21:16	05:48 21:54	05:27 21:52	05:34 21:06	06:02 19:58	07:52 18:48	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	07:48 (T01) 20:27	06:46 21:18	05:46 21:55	05:28 21:51	05:36 21:04	06:04 19:56	07:54 18:46	07:49 16:47	08:34 16:22
14	08:37 16:48	07:53 17:46	06:53 18:36	07:48 (T01) 20:29	06:44 21:19	05:44 21:56	05:29 21:50	05:38 21:02	06:06 19:54	07:56 18:44	07:51 16:45	08:35 16:22
15	08:37 16:51	07:51 17:47	06:51 18:37	07:48 (T01) 20:31	06:43 21:21	05:43 21:56	05:30 21:49	05:40 21:00	06:08 19:51	07:57 18:42	07:53 16:44	08:36 16:22
16	08:36 16:52	07:49 17:48	06:48 18:38	07:48 (T01) 20:32	06:41 21:22	05:40 21:57	05:32 21:48	05:41 20:56	06:16 19:48	07:58 18:40	07:55 16:43	08:37 16:22
17	08:35 16:54	07:47 17:50	06:46 18:41	07:48 (T01) 20:34	06:39 21:24	05:38 21:57	05:34 21:47	05:43 20:58	06:20 19:47	07:59 18:38	07:56 16:41	08:38 16:23
18	08:34 16:55	07:45 17:52	06:44 18:43	07:48 (T01) 20:35	06:37 21:25	05:37 21:58	05:35 21:40	05:44 20:54	06:21 19:44	07:59 18:36	07:57 16:40	08:39 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	07:48 (T01) 20:36	06:35 21:27	05:35 21:58	05:36 21:45	05:45 20:52	06:22 19:42	07:59 18:33	07:58 16:39	08:40 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	07:48 (T01) 20:38	06:33 21:28	05:34 21:58	05:37 21:43	05:46 20:50	06:23 19:39	07:59 18:31	07:59 16:38	08:41 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	07:48 (T01) 20:39	06:31 21:30	05:33 21:58	05:38 21:42	05:47 20:48	06:24 19:37	07:59 18:29	07:59 16:37	08:42 16:24
22	08:30 17:02	07:37 18:00	06:34 18:50	07:48 (T01) 20:41	06:29 21:31	05:32 21:59	05:40 21:41	05:49 20:46	06:25 19:35	07:59 18:27	07:59 16:36	08:43 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	07:48 (T01) 20:42	06:27 21:33	05:31 21:59	05:41 21:40	05:50 20:43	06:26 19:32	07:59 18:25	07:59 16:35	08:44 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	07:48 (T01) 20:43	06:25 21:34	05:30 21:59	05:42 21:38	05:49 20:41	06:27 19:30	07:59 18:23	07:59 16:34	08:45 16:25
25	08:26 17:08	07:31 18:05	06:28 18:55	07:48 (T01) 20:44	06:23 21:35	05:29 21:59	05:43 21:37	05:50 20:38	06:28 19:28	07:59 18:21	07:59 16:33	08:46 16:26
26	08:25 17:10	07:29 18:07	06:25 18:56	07:48 (T01) 20:45	06:21 21:37	05:28 21:59	05:45 21:35	05:52 20:37	06:29 19:25	07:59 18:19	07:59 16:32	08:47 16:27
27	08:23 17:11	07:27 18:09	06:23 18:58	07:48 (T01) 20:46	06:19 21:38	05:27 21:59	05:47 21:34	05:54 20:36	06:30 19:23	07:59 18:17	07:59 16:31	08:48 16:28
28	08:22 17:13	07:24 18:11	06:20 19:00	07:48 (T01) 20:47	06:17 21:39	05:26 21:59	05:49 21:32	05:56 20:33	06:31 19:21	07:59 18:15	07:59 16:30	08:49 16:29
29	08:20 17:15	07:18 18:15	06:18 19:02	07:48 (T01) 20:48	06:15 21:41	05:25 21:59	05:51 21:31	05:58 20:30	06:32 19:18	07:59 18:13	07:59 16:29	08:50 16:30
30	08:19 17:17	07:15 18:13	06:16 19:03	07:48 (T01) 20:49	06:13 21:42	05:24 21:58	05:52 21:29	05:61 20:28	06:33 19:16	07:59 18:11	07:59 16:28	08:51 16:31
31	08:17 17:19	07:13 18:11	06:13 19:05	07:48 (T01) 20:50	06:11 21:43	05:23 21:58	05:53 21:28	05:61 20:26	06:34 19:09	07:59 18:09	07:59 16:27	08:52 16:32
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case		20	48							68		
Sun reduction		0.22	0.26							0.25		
Oper. time red.		0.96	0.96							0.96		
Wind dir. red.		0.02	0.02							0.02		
Total reduction		0.13	0.15							0.15		
Total, real		3	7							10		

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45:15

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H15 - H15

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 906 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 18:32	08:16 17:20	07:22 18:12	07:11 20:07	06:08 20:58	05:20 21:44	05:17 21:58	05:54 21:26	06:44 20:24	07:34 19:14	07:28 17:07	08:19 16:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:09 20:08	06:04 21:00	05:20 21:45	05:18 21:58	05:56 21:24	06:46 20:21	07:35 19:11	07:30 17:05	08:21 16:26
3	08:43 16:34	08:13 17:24	07:18 18:16	07:07 20:10	06:02 21:01	05:19 21:46	05:19 21:57	05:57 21:23	06:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:43 16:36	08:11 17:26	07:16 18:18	07:04 20:12	06:00 21:03	05:18 21:47	05:20 21:57	05:59 21:21	06:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	05:17 21:48	05:20 21:57	06:00 21:19	06:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	05:17 21:49	05:21 21:56	06:02 21:17	06:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:42 16:39	08:06 17:32	07:09 18:23	06:57 20:17	05:55 21:08	05:16 21:50	05:22 21:55	06:04 21:16	06:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	06:55 20:19	05:53 21:10	05:16 21:51	05:23 21:55	06:05 21:14	06:56 20:08	07:46 18:58	07:41 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	06:53 20:20	05:51 21:11	05:15 21:52	05:24 21:54	06:07 21:12	06:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:29	06:51 20:22	05:50 21:13	05:15 21:53	05:25 21:53	06:08 21:10	06:59 20:03	07:49 18:53	07:44 16:52	08:31 16:23
11	08:40 16:45	07:59 17:39	07:00 18:30	06:48 20:24	05:48 21:15	05:14 21:54	05:26 21:53	06:10 21:08	07:01 20:01	07:51 18:51	07:46 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:58 18:32	06:46 20:26	05:46 21:16	05:14 21:54	05:27 21:52	06:12 21:06	07:02 19:58	07:52 18:49	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	05:45 21:18	05:14 21:55	05:28 21:51	06:13 21:04	07:04 19:56	07:54 18:48	07:49 16:47	08:34 16:22
14	08:37 16:49	07:53 17:46	06:53 18:36	06:42 20:29	05:43 21:19	05:13 21:56	05:29 21:50	06:15 21:02	07:06 19:54	07:56 18:44	07:51 16:46	08:35 16:22
15	08:37 16:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	05:13 21:56	05:31 21:49	06:17 21:00	07:07 19:51	07:58 18:42	07:53 16:44	08:36 16:22
16	08:36 16:52	07:49 17:48	06:48 18:39	06:37 20:32	05:40 21:22	05:13 21:57	05:32 21:48	06:18 20:58	07:09 19:48	07:59 18:40	08:28 16:43	08:37 16:22
17	08:35 16:54	07:47 17:50	06:46 18:41	06:35 20:34	05:38 21:24	05:13 21:57	05:33 21:47	06:20 20:56	07:11 19:47	08:01 18:38	08:27 16:43	08:37 16:23
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	05:37 21:25	05:13 21:58	05:34 21:46	06:21 20:54	07:12 19:44	08:03 18:36	08:29 16:44	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	05:35 21:27	05:13 21:58	05:36 21:45	06:23 20:52	07:14 19:42	08:05 18:33	08:31 16:45	08:39 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:29 20:39	05:34 21:28	05:13 21:58	05:37 21:43	06:25 20:50	07:15 19:39	08:06 18:31	08:33 16:45	08:40 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	05:13 21:58	05:38 21:42	06:26 20:48	07:17 19:37	08:08 18:29	08:35 16:46	08:40 16:24
22	08:30 17:02	07:37 18:00	06:34 18:50	06:24 20:43	05:31 21:31	05:13 21:59	05:40 21:41	06:28 20:46	07:19 19:35	08:10 18:27	08:36 16:47	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	05:30 21:33	05:14 21:59	05:41 21:40	06:30 20:43	08:12 19:32	08:12 18:25	08:38 16:48	08:41 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	05:14 21:59	05:42 21:38	06:31 20:41	07:22 19:30	08:13 18:23	08:40 16:49	08:42 16:25
25	08:26 17:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	05:14 21:59	05:44 21:37	06:33 20:39	07:24 19:28	08:15 18:15	08:41 16:50	08:43 16:26
26	08:25 17:10	07:29 18:07	06:25 18:56	06:16 20:50	05:26 21:37	05:15 21:59	05:45 21:35	06:35 20:37	07:25 19:25	08:16 18:19	08:42 16:51	08:44 16:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	05:25 21:38	05:15 21:59	05:47 21:34	06:36 20:35	07:27 19:23	08:17 18:17	08:43 16:52	08:45 16:27
28	08:22 17:13	07:24 18:11	06:20 19:00	06:12 20:53	05:24 21:39	05:16 21:59	05:48 21:32	06:38 20:33	07:29 19:21	08:18 18:15	08:44 16:53	08:46 16:28
29	08:20 17:15	07:22 18:15	06:18 20:02	06:10 20:55	05:23 21:41	05:16 21:59	05:50 21:31	06:39 20:30	07:30 19:18	08:22 18:13	08:45 16:54	08:48 16:29
30	08:19 17:17	07:16 18:16	06:16 20:03	06:08 20:56	05:22 21:42	05:17 21:58	05:51 21:29	06:41 20:28	07:32 19:16	08:24 18:11	08:46 16:55	08:49 16:30
31	08:17 17:19	07:15 18:15	06:15 20:05	06:07 21:43	05:21 21:43	05:16 21:28	05:53 20:26	06:43 20:26	07:28 18:09	08:26 17:09	08:47 16:56	08:50 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	286	243
Total, worst case			109							110		
Sun reduction			0.22							0.26		
Oper. time red.			0.96							0.96		
Wind dir. red.			0.63							0.63		
Total reduction			0.13							0.15		
Total, real			15							17		

Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) Sun set (hh:mm) Minutes with flicker First time (hh:mm) with flicker Last time (hh:mm) with flicker (WTG causing flicker first time) (WTG causing flicker last time)

Project:

Moneygorm Wind Farm

Printed Page

18/08/2011 09:45:17

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H17 - H17

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December		
1	08:43 16:32	08:16 17:20	09:10 (TO1) 20:07	07:22 20:07	07:11 20:58	06:06 21:44	05:20 21:58	05:17 21:58	05:54 21:26	06:44 20:24	07:34 19:14	07:28 17:07	08:19 16:27	08:52 (TO1) 19 00:11 (TO1)
2	08:43 16:34	08:14 17:22	09:12 (TO1) 20:07	07:20 20:08	07:08 20:04	06:04 20:20	05:18 21:58	05:18 21:58	05:56 21:24	06:46 20:21	07:36 19:11	07:30 17:05	08:21 16:26	08:54 (TO1) 17 00:11 (TO1)
3	08:43 16:34	08:13 17:24	09:11 (TO1) 20:07	07:18 20:08	07:07 20:04	06:03 20:16	05:19 21:57	05:19 21:57	05:57 21:23	06:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25	08:55 (TO1) 14 00:08 (TO1)
4	08:43 16:36	08:11 17:26	09:10 (TO1) 20:07	07:16 20:12	07:06 20:12	06:00 21:03	05:20 21:47	05:20 21:57	05:59 21:21	06:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25	08:58 (TO1) 11 00:08 (TO1)
5	08:42 16:37	08:09 17:28	09:14 (TO1) 20:07	07:13 20:14	07:02 20:14	06:05 21:05	05:17 21:48	05:20 21:57	06:00 21:19	06:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24	09:00 (TO1) 7 00:07 (TO1)
6	08:42 16:38	08:08 17:30	09:15 (TO1) 20:07	07:11 20:15	07:00 20:15	06:07 21:06	05:17 21:49	05:21 21:56	06:02 21:17	06:53 20:12	07:42 19:02	07:37 16:58	08:26 16:24	09:00 (TO1) 08:43 (TO1)
7	08:42 16:39	08:06 17:32	09:16 (TO1) 20:07	07:09 20:17	07:00 20:17	06:08 21:08	05:16 21:50	05:22 21:58	06:04 21:16	06:54 20:10	07:44 19:00	07:39 16:57	08:27 16:23	09:10 (TO1) 08:43 (TO1)
8	08:41 16:41	08:14 17:33	09:17 (TO1) 20:07	07:07 20:19	07:00 20:19	06:09 21:10	05:15 21:51	05:23 21:55	06:05 21:14	06:56 20:08	07:46 19:00	07:40 16:55	08:29 16:23	09:11 (TO1) 08:43 (TO1)
9	08:41 16:42	08:12 (TO1) 17:35	09:18 (TO1) 20:07	07:07 20:20	07:00 20:20	06:10 21:11	05:15 21:52	05:24 21:54	06:07 21:12	06:57 20:05	07:47 19:00	07:42 16:53	08:30 16:23	09:12 (TO1) 08:43 (TO1)
10	08:40 16:43	08:11 (TO1) 17:37	09:19 (TO1) 20:07	07:07 20:22	07:00 20:22	06:11 21:13	05:15 21:53	05:25 21:53	06:08 21:10	06:58 20:03	07:48 19:00	07:44 16:52	08:31 16:23	09:13 (TO1) 08:43 (TO1)
11	08:40 16:45	08:10 (TO1) 17:39	09:20 (TO1) 20:07	07:07 20:24	07:00 20:24	06:12 21:15	05:14 21:54	05:26 21:53	06:10 21:08	06:59 20:01	07:49 19:00	07:46 16:50	08:32 16:22	09:14 (TO1) 08:43 (TO1)
12	08:39 16:46	08:11 (TO1) 17:41	09:21 (TO1) 20:07	07:07 20:26	07:00 20:26	06:13 21:16	05:14 21:54	05:27 21:52	06:12 21:06	07:02 19:00	07:50 19:00	07:48 16:48	08:33 16:22	09:15 (TO1) 08:43 (TO1)
13	08:38 16:48	08:10 (TO1) 17:43	09:22 (TO1) 20:07	07:07 20:28	07:00 20:28	06:14 21:18	05:13 21:55	05:28 21:51	06:13 21:04	07:04 19:00	07:54 19:00	07:49 16:47	08:34 16:22	09:16 (TO1) 08:43 (TO1)
14	08:37 16:49	08:10 (TO1) 17:45	09:23 (TO1) 20:07	07:07 20:30	07:00 20:30	06:15 21:22	05:13 21:56	05:29 21:50	06:15 21:02	07:06 19:00	07:56 19:00	07:51 16:45	08:35 16:22	09:17 (TO1) 08:43 (TO1)
15	08:37 16:51	08:11 (TO1) 17:47	09:24 (TO1) 20:07	07:07 20:32	07:00 20:32	06:16 21:24	05:13 21:57	05:30 21:48	06:17 21:00	07:07 19:00	07:58 19:00	07:53 16:44	08:36 16:22	09:18 (TO1) 08:43 (TO1)
16	08:36 16:52	08:12 (TO1) 17:48	09:25 (TO1) 20:07	07:07 20:34	07:00 20:34	06:17 21:26	05:13 21:58	05:31 21:46	06:18 20:58	07:08 19:00	07:59 19:00	07:55 16:43	08:37 16:22	09:19 (TO1) 08:43 (TO1)
17	08:36 16:54	08:13 (TO1) 17:50	09:26 (TO1) 20:07	07:07 20:36	07:00 20:36	06:18 21:28	05:13 21:59	05:32 21:44	06:19 20:50	07:09 19:00	07:59 19:00	07:56 16:43	08:38 16:22	09:20 (TO1) 08:43 (TO1)
18	08:34 16:56	08:14 (TO1) 17:52	09:27 (TO1) 20:07	07:07 20:38	07:00 20:38	06:19 21:30	05:13 21:59	05:33 21:46	06:20 20:54	07:10 19:00	07:59 19:00	07:55 16:43	08:39 16:22	09:21 (TO1) 08:43 (TO1)
19	08:33 16:57	08:15 (TO1) 17:54	09:28 (TO1) 20:07	07:07 20:40	07:00 20:40	06:20 21:32	05:13 21:59	05:34 21:45	06:21 20:52	07:11 19:00	07:59 19:00	07:54 16:43	08:40 16:22	09:22 (TO1) 08:43 (TO1)
20	08:32 16:58	08:16 (TO1) 17:56	09:29 (TO1) 20:07	07:07 20:42	07:00 20:42	06:21 21:34	05:13 21:59	05:35 21:43	06:22 20:50	07:12 19:00	07:59 19:00	07:53 16:43	08:41 16:22	09:23 (TO1) 08:43 (TO1)
21	08:31 17:01	08:17 (TO1) 17:58	09:30 (TO1) 20:07	07:07 20:44	07:00 20:44	06:22 21:36	05:13 21:59	05:36 21:42	06:23 20:48	07:13 19:00	07:59 19:00	07:52 16:43	08:42 16:22	09:24 (TO1) 08:43 (TO1)
22	08:30 17:02	08:18 (TO1) 18:00	09:31 (TO1) 20:07	07:07 20:46	07:00 20:46	06:23 21:38	05:13 21:59	05:37 21:41	06:24 20:46	07:14 19:00	07:59 19:00	07:51 16:43	08:43 16:22	09:25 (TO1) 08:43 (TO1)
23	08:28 17:04	08:19 (TO1) 18:01	09:32 (TO1) 20:07	07:07 20:48	07:00 20:48	06:24 21:40	05:13 21:59	05:38 21:39	06:25 20:43	07:15 19:00	07:59 19:00	07:50 16:43	08:44 16:22	09:26 (TO1) 08:43 (TO1)
24	08:27 17:06	08:20 (TO1) 18:03	09:33 (TO1) 20:07	07:07 20:50	07:00 20:50	06:25 21:42	05:13 21:59	05:39 21:38	06:26 20:41	07:16 19:00	07:59 19:00	07:49 16:43	08:45 16:22	09:27 (TO1) 08:43 (TO1)
25	08:26 17:08	08:21 (TO1) 18:05	09:34 (TO1) 20:07	07:07 20:52	07:00 20:52	06:26 21:44	05:13 21:59	05:40 21:37	06:27 20:39	07:17 19:00	07:59 19:00	07:47 16:43	08:46 16:22	09:28 (TO1) 08:43 (TO1)
26	08:25 17:09	08:22 (TO1) 18:07	09:35 (TO1) 20:07	07:07 20:54	07:00 20:54	06:27 21:46	05:13 21:59	05:41 21:36	06:28 20:37	07:18 19:00	07:59 19:00	07:45 16:43	08:47 16:22	09:29 (TO1) 08:43 (TO1)
27	08:23 17:11	08:23 (TO1) 18:09	09:36 (TO1) 20:07	07:07 20:56	07:00 20:56	06:28 21:48	05:13 21:59	05:42 21:35	06:29 20:36	07:19 19:00	07:59 19:00	07:43 16:43	08:48 16:22	09:30 (TO1) 08:43 (TO1)
28	08:22 17:13	08:24 (TO1) 18:11	09:37 (TO1) 20:07	07:07 20:58	07:00 20:58	06:29 21:50	05:13 21:59	05:43 21:32	06:30 20:32	07:20 19:00	07:59 19:00	07:41 16:43	08:49 16:22	09:31 (TO1) 08:43 (TO1)
29	08:20 17:15	08:25 (TO1) 18:13	09:38 (TO1) 20:07	07:07 21:00	07:00 21:00	06:30 21:52	05:13 21:59	05:44 21:30	06:31 20:30	07:21 19:00	07:59 19:00	07:39 16:43	08:50 16:22	09:32 (TO1) 08:43 (TO1)
30	08:19 17:17	08:26 (TO1) 18:15	09:39 (TO1) 20:07	07:07 21:02	07:00 21:02	06:31 21:54	05:13 21:59	05:45 21:29	06:32 20:28	07:22 19:00	07:59 19:00	07:37 16:43	08:51 16:22	09:33 (TO1) 08:43 (TO1)
31	08:17 17:19	08:27 (TO1) 18:17	09:40 (TO1) 20:07	07:07 21:04	07:00 21:04	06:32 21:56	05:13 21:59	05:46 21:28	06:33 20:26	07:23 19:00	07:59 19:00	07:35 16:43	08:52 16:22	09:34 (TO1) 08:43 (TO1)
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243	88	
Total, worst case	856	200									793		68	
Sun reduction	0.20	0.22									0.24		0.17	
Oper. time red.	0.96	0.96									0.96		0.96	
Wind dir. red.	0.62	0.62									0.62		0.62	
Total reduction	0.12	0.13									0.15		0.10	
Total, real	79	27									115		7	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Moneygorm Wind Farm

Printed Page
18/08/2011 09:45 / 18
Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980
Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H18 - H18

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
954 200 332 331 441 008 867 1,275 1,023 1,130 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43	08:16	07:22	07:11	06:06	05:20	05:17	05:54	06:44	07:34	07:28	08:19
	16:32	17:20	18:12	20:07	20:58	21:44	21:58	21:28	20:24	19:14	17:07	16:27
2	08:43	08:14	07:20	07:09	05:04	05:20	05:18	05:56	06:46	07:35	07:30	08:21
	16:33	17:22	18:14	20:08	21:00	21:45	21:58	21:24	20:21	19:11	17:05	16:26
3	08:43	08:13	07:18	07:07	06:02	05:19	05:19	05:57	06:48	07:37	07:31	08:22
	16:34	17:24	18:16	20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:04	16:25
4	08:43	08:11	07:16	07:04	06:00	05:18	05:20	05:59	06:49	07:39	07:33	08:23
	16:36	17:26	18:18	20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02	16:25
5	08:42	08:09	07:13	07:02	05:58	05:17	05:20	06:00	06:51	07:40	07:35	08:25
	16:37	17:28	18:20	20:14	21:05	21:48	21:57	21:19	20:14	19:04	17:00	16:24
6	08:42	08:08	07:11	07:00	05:57	05:17	05:21	06:02	06:52	07:42	07:37	08:26
	16:38	17:30	18:21	20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58	16:24
7	08:42	08:06	07:09	06:57	05:55	05:16	05:22	06:04	06:54	07:44	07:39	08:27
	16:39	17:32	18:23	20:17	21:08	21:50	21:55	21:16	20:10	19:00	16:56	16:23
8	08:41	08:04	07:07	06:55	05:53	05:16	05:23	06:05	06:56	07:45	07:40	08:28
	16:41	17:33	18:25	20:19	21:10	21:51	21:55	21:14	20:07	18:58	16:55	16:23
9	08:41	08:02	07:04	06:53	05:51	05:15	05:24	06:07	06:57	07:47	07:42	08:30
	16:42	17:35	18:27	20:20	21:11	21:52	21:54	21:12	20:05	18:55	16:53	16:23
10	08:40	08:01	07:02	06:51	05:49	05:15	05:25	06:08	06:59	07:49	07:44	08:31
	16:43	17:37	18:28	20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:51	16:22
11	08:40	07:59	07:00	06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:46	08:32
	16:45	17:39	18:30	20:24	21:15	21:54	21:53	21:08	20:01	18:51	16:50	16:22
12	08:39	07:57	06:57	06:46	05:46	05:14	05:27	06:12	07:02	07:52	07:48	08:33
	16:46	17:41	18:32	20:26	21:16	21:54	21:52	21:06	19:58	18:49	16:48	16:22
13	08:38	07:55	06:55	06:44	05:44	05:14	05:28	06:13	07:04	07:54	07:49	08:34
	16:48	17:43	18:34	20:27	21:18	21:55	21:51	21:04	19:56	18:46	16:47	16:22
14	08:37	07:53	06:53	06:42	05:43	05:13	05:29	06:15	07:06	07:56	07:51	08:35
	16:49	17:46	18:36	20:30	21:19	21:56	21:50	21:02	19:54	18:44	16:46	16:22
15	08:37	07:51	06:51	06:39	05:41	05:13	05:31	06:16	07:07	07:58	07:53	08:36
	16:51	17:47	18:37	20:31	21:21	21:58	21:49	21:00	19:51	18:42	16:44	16:22
16	08:36	07:49	06:48	06:37	05:40	05:13	05:32	06:18	07:09	07:59	07:55	08:37
	16:52	17:48	18:39	20:32	21:22	21:57	21:48	20:58	19:49	18:40	16:42	16:22
17	08:35	07:47	06:46	06:35	05:38	05:13	05:33	06:20	07:10	08:01	07:56	08:37
	16:54	17:50	18:41	20:34	21:24	21:57	21:47	20:56	19:46	18:38	16:41	16:22
18	08:34	07:45	06:44	06:33	05:37	05:13	05:34	06:21	07:12	08:03	07:58	08:38
	16:56	17:52	18:43	20:36	21:25	21:58	21:46	20:54	19:44	18:35	16:40	16:23
19	08:33	07:43	06:41	06:31	05:35	05:13	05:36	06:23	07:14	08:05	08:00	08:39
	16:57	17:54	18:44	20:38	21:27	21:58	21:45	20:52	19:42	18:33	16:38	16:23
20	08:32	07:41	06:39	06:28	05:34	05:13	05:37	06:25	07:15	08:06	08:02	08:40
	16:59	17:56	18:46	20:39	21:28	21:58	21:43	20:50	19:39	18:31	16:37	16:23
21	08:31	07:39	06:37	06:26	05:33	05:13	05:38	06:26	07:17	08:08	08:03	08:40
	17:01	17:58	18:48	20:41	21:30	21:58	21:42	20:48	19:37	18:29	16:36	16:24
22	08:30	07:37	06:34	06:24	05:31	05:13	05:40	06:28	07:19	08:10	08:05	08:41
	17:02	18:00	18:49	20:43	21:31	21:59	21:41	20:46	19:35	18:27	16:35	16:24
23	08:28	07:35	06:32	06:22	05:30	05:14	05:41	06:30	07:20	08:12	08:07	08:41
	17:04	18:01	18:51	20:44	21:33	21:59	21:40	20:43	19:32	18:25	16:34	16:25
24	08:27	07:33	06:30	06:20	05:29	05:14	05:42	06:31	07:22	08:13	08:08	08:42
	17:06	18:03	18:53	20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33	16:25
25	08:26	07:31	06:27	06:18	05:28	05:14	05:44	06:33	07:24	07:15	08:10	08:42
	17:08	18:05	18:55	20:48	21:35	21:59	21:37	20:39	19:28	17:21	16:32	16:26
26	08:25	07:29	06:25	06:16	05:26	05:15	05:45	06:34	07:25	07:17	08:12	08:42
	17:09	18:07	18:56	20:50	21:37	21:59	21:35	20:37	19:25	17:19	16:31	16:27
27	08:23	07:26	06:23	06:14	05:25	05:15	05:47	06:36	07:27	07:19	08:13	08:43
	17:11	18:09	18:58	20:51	21:38	21:59	21:34	20:35	19:23	17:17	16:30	16:27
28	08:22	07:24	06:20	06:12	05:24	05:16	05:48	06:38	07:29	07:21	08:15	08:43
	17:13	18:11	19:00	20:53	21:39	21:59	21:32	20:32	19:21	17:15	16:29	16:28
29	08:20	07:18	06:10	05:23	05:16	05:50	06:39	07:30	07:22	08:16	08:43	
	17:15	20:02	20:55	21:41	21:59	21:31	20:30	19:18	17:13	16:28	16:29	
30	08:19	07:16	06:08	05:22	05:17	05:51	06:41	07:32	07:24	08:18	08:43	
	17:17	20:03	20:56	21:42	21:58	21:29	20:28	19:16	17:11	16:27	16:30	
31	06:17	07:19	07:19	05:21	05:21	05:50	06:40	07:26	07:26	08:16	08:40	
	17:19	20:05	21:45	21:45	21:45	21:26	20:26	19:14	17:09	16:24	16:31	
Potential sun hours	258	277	387	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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10 OCT 2011
Cork County Council
County Hall
Cork

20 SEP 2011
Cork County Council
County Hall

Project:

Moneygorm Wind Farm

Printed/Page

18/08/2011 09:45:19

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H19 - H19

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

January	February	March	April	May	June	July	August	September	October	November	December
1 08:43 08:18		07:22		07:11	05:05	05:20	05:17	05:54	06:44	07:34	07:28 08:19
15:32 17:20		18:12	13 17:34 (T01)	20:07	20:58	21:44	21:58	21:26	20:23	19:14	17:07 16:27
2 08:43 08:14		07:20		07:09	05:04	05:20	05:18	05:55	06:45	07:35	07:30 08:21
15:33 17:22		18:14	10 17:32 (T01)	20:08	21:00	21:45	21:58	21:24	20:21	19:11	17:05 16:26
3 08:43 08:13		07:18		07:06	05:02	05:19	05:19	05:57	06:48	07:37	07:31 08:22
15:34 17:24		18:16		20:10	21:01	21:46	21:57	21:23	20:19	19:09	17:03 16:25
4 08:43 08:11		07:15		07:04	05:00	05:18	05:20	05:59	06:49	07:39	07:33 08:23
15:36 17:26		18:18		20:12	21:03	21:47	21:57	21:21	20:17	19:07	17:02 16:25
5 08:42 08:09		07:13		07:02	05:08	05:17	05:20	06:00	06:51	07:40	07:35 08:25
15:37 17:28		18:20		20:14	21:05	21:48	21:56	21:19	20:14	19:04	17:00 16:24
6 08:42 08:08		07:11		07:00	05:07	05:17	05:21	06:02	06:52	07:42	07:37 08:26
15:38 17:30		18:21		20:15	21:06	21:49	21:56	21:17	20:12	19:02	16:58 16:24
7 08:42 08:06		07:09		06:57	05:05	05:16	05:22	06:04	06:54	07:44	07:39 08:27
15:39 17:32		18:23		20:17	21:08	21:50	21:55	21:15	20:10	19:00	16:56 16:23
8 08:41 08:04		07:07		06:55	05:03	05:16	05:23	06:05	06:56	07:45	07:40 08:28
15:41 17:33		18:25		20:19	21:10	21:51	21:55	21:14	20:07	18:58	16:55 16:23
9 08:41 08:02		07:04		06:53	05:01	05:15	05:24	06:07	06:57	07:47	07:42 08:30
15:42 17:35		18:27		20:20	21:11	21:52	21:54	21:12	20:05	18:55	16:53 16:23
10 08:40 08:01		07:02		06:51	05:49	05:15	05:25	06:08	06:59	07:49	07:44 08:31
15:43 17:37		18:28		20:22	21:13	21:53	21:53	21:10	20:03	18:53	16:51 16:22
11 08:39 07:59		07:00		06:48	05:48	05:14	05:26	06:10	07:01	07:51	07:45 08:32
15:45 17:39		18:30		20:24	21:14	21:54	21:52	21:08	20:00	18:51	6 18:04 (T01) 16:50 16:22
12 08:39 07:57		06:57		06:46	05:46	05:14	05:27	06:12	07:02	07:52	11 18:07 (T01) 16:48 08:33
15:46 17:41		18:32		20:26	21:16	21:54	21:52	21:06	19:58	18:49	17:54 (T01) 16:48 08:34
13 08:38 07:55		06:55		06:44	05:44	05:14	05:28	06:13	07:04	07:54	11 18:08 (T01) 16:47 16:22
15:48 17:43		18:34		20:27	21:18	21:56	21:51	21:04	19:56	18:46	14 18:08 (T01) 16:47 16:22
14 08:37 07:53		06:53		06:42	05:43	05:13	05:29	06:15	07:06	07:56	17:53 (T01) 16:45 16:22
15:49 17:45		18:35		20:29	21:19	21:55	21:50	21:02	19:53	18:44	16 18:09 (T01) 16:45 16:22
16 08:37 07:51		06:51		06:39	05:41	05:13	05:31	06:18	07:07	07:58	17:52 (T01) 16:44 16:22
15:51 17:47		18:37		20:31	21:21	21:56	21:49	21:00	19:51	18:42	16 18:08 (T01) 16:44 16:22
16 08:36 07:49		06:48		06:37	05:40	05:13	05:32	06:18	07:09	07:59	17:51 (T01) 16:42 16:22
15:52 17:48		18:39		20:32	21:22	21:57	21:48	20:58	19:49	18:40	18 18:08 (T01) 16:42 16:22
17 08:35 07:47		06:45		06:35	05:38	05:13	05:33	06:20	07:10	08:01	17:51 (T01) 16:41 16:22
15:54 17:50		18:41		20:34	21:24	21:57	21:47	20:56	19:46	18:38	17 18:08 (T01) 16:41 16:22
18 08:34 07:45		06:44		06:33	05:37	05:13	05:34	06:21	07:12	08:03	17:52 (T01) 16:40 08:38
15:56 17:52		18:43		20:36	21:25	21:57	21:46	20:54	19:44	18:35	15 18:07 (T01) 16:40 16:23
19 08:33 07:43		06:41		06:31	05:35	05:13	05:36	06:23	07:14	08:05	17:52 (T01) 16:40 08:39
15:57 17:54		18:44		20:38	21:27	21:58	21:44	20:52	19:42	18:33	13 18:05 (T01) 16:38 16:23
20 08:32 07:41		17:25 (T01) 06:39		06:28	05:34	05:13	05:37	06:25	07:15	08:06	17:53 (T01) 16:38 08:39
15:59 17:56	3 17:28 (T01) 16:46			20:39	21:28	21:58	21:43	20:50	19:39	18:31	10 18:03 (T01) 16:37 16:23
21 08:31 07:39		17:23 (T01) 06:37		06:25	05:33	05:13	05:38	06:26	07:17	08:08	17:54 (T01) 16:37 08:40
17:01 17:58	7 17:30 (T01) 16:48			20:41	21:30	21:58	21:42	20:48	19:37	18:29	6 18:00 (T01) 16:36 16:24
22 08:30 07:37		17:21 (T01) 06:34		06:24	05:31	05:13	05:40	06:28	07:19	08:10	17:57 (T01) 16:35 08:41
17:02 18:00	11 17:32 (T01) 16:49			20:43	21:31	21:59	21:41	20:46	19:35	18:27	2 17:58 (T01) 16:35 16:24
23 08:28 07:35		17:21 (T01) 06:32		06:22	05:30	05:14	05:41	06:30	07:20	08:12	17:58 (T01) 16:34 08:41
17:04 18:01	13 17:34 (T01) 16:51			20:44	21:33	21:59	21:39	20:43	19:32	18:25	16:34 16:25
24 08:27 07:33		17:20 (T01) 06:30		06:20	05:29	05:14	05:42	06:31	07:22	08:13	16:34 08:42
17:06 18:03	17 17:37 (T01) 16:53			20:46	21:34	21:59	21:38	20:41	19:30	18:23	16:33 16:25
25 08:26 07:31		17:20 (T01) 06:27		06:18	05:28	05:14	05:44	06:33	07:24	08:15	16:32 16:25
17:08 18:05	17 17:39 (T01) 16:55			20:48	21:35	21:59	21:37	20:39	19:28	18:21	16:32 16:26
26 08:25 07:29		17:18 (T01) 06:25		06:16	05:26	05:15	05:45	06:34	07:25	08:17	16:31 16:27
17:09 18:07	17 17:38 (T01) 16:58			20:49	21:37	21:59	21:35	20:37	19:25	18:19	16:31 16:27
27 08:23 07:26		17:20 (T01) 06:23		06:14	05:25	05:15	05:47	06:36	07:27	08:19	16:31 16:28
17:11 18:09	18 17:38 (T01) 16:58			20:51	21:38	21:59	21:34	20:35	19:23	18:17	16:30 16:27
28 08:22 07:24		17:20 (T01) 06:20		06:12	05:24	05:16	05:48	06:38	07:29	08:21	16:30 16:28
17:13 18:11	15 17:35 (T01) 16:00			20:53	21:39	21:59	21:32	20:32	19:21	18:15	16:29 16:28
29 08:20 17:15		07:18		06:10	05:23	05:16	05:50	06:39	07:30	08:22	16:28 16:29
30 08:19 17:17		07:16		20:55	21:41	21:59	21:31	20:30	19:18	18:13	16:28 16:29
17:19 17:19		20:03		06:08	05:22	05:17	05:51	06:41	07:32	08:24	16:28 16:29
31 08:17 17:19		07:13		20:56	21:42	21:58	21:29	20:28	19:16	18:11	16:27 16:30
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266 243
Total, worst case		116	23							144	
Sun reduction		0.22	0.26							0.26	
Oper. time red.		0.06	0.06							0.06	
Wind dir. red.		0.64	0.64							0.64	
Total reduction		0.14	0.16							0.15	
Total, real		16	4							23	

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Moneygorm Wind Farm

Printed Page
18/08/2011 09:45 / 20

Licensee user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H20 - H20

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.68	2.20	3.08	4.72	5.31	4.94	4.67	4.36	3.78	2.74	2.15	1.32

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
354	290	332	331	441	808	867	1,275	1,023	1,139	816	612	8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 15:32	08:16 17:20	07:22 18:12	07:11 20:07	06:08 20:58	20:15 (T01) 21:44	05:20 21:58	05:54 21:25	20:27 (T01) 20:23	06:44 19:14	07:28 17:07	08:19 15:27
2	08:43 15:33	08:14 17:22	07:20 18:14	07:09 20:08	06:04 21:00	20:14 (T01) 21:45	05:20 21:58	05:58 21:24	20:25 (T01) 20:21	06:45 19:11	07:36 17:05	08:20 15:25
3	08:43 15:34	08:13 17:24	07:18 18:16	07:06 20:10	06:02 21:01	20:13 (T01) 21:46	05:19 21:57	05:57 21:23	20:26 (T01) 20:19	06:48 19:08	07:37 17:04	08:22 15:25
4	08:43 15:36	08:11 17:26	07:15 18:18	07:04 20:12	06:00 21:03	20:12 (T01) 21:47	05:20 21:57	05:59 21:21	20:23 (T01) 20:17	06:49 19:07	07:38 17:02	08:23 15:25
5	08:42 15:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	20:12 (T01) 21:48	05:17 21:56	05:20 21:19	20:23 (T01) 20:14	06:51 19:04	07:40 17:00	08:25 15:24
6	08:42 15:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	20:13 (T01) 21:49	05:21 21:56	05:21 21:17	20:22 (T01) 20:12	06:52 19:02	07:42 16:58	08:26 15:24
7	08:42 15:39	08:06 17:32	07:08 18:23	06:57 20:17	05:55 21:08	20:13 (T01) 21:50	05:22 21:55	06:04 21:15	20:22 (T01) 20:10	06:54 19:00	07:44 16:58	08:27 15:23
8	08:41 15:41	08:04 17:33	07:07 18:25	06:55 20:19	05:53 21:10	20:13 (T01) 21:51	05:23 21:55	06:05 21:14	20:22 (T01) 20:07	06:56 18:58	07:45 16:55	08:28 15:23
9	08:41 15:42	08:02 17:35	07:04 18:27	06:53 20:20	05:51 21:11	20:14 (T01) 21:52	05:24 21:54	06:07 21:12	20:22 (T01) 20:05	06:57 18:55	07:47 16:53	08:30 15:23
10	08:40 15:43	08:01 17:37	07:02 18:28	06:51 20:22	05:49 21:13	20:15 (T01) 21:53	05:25 21:53	06:08 21:10	20:22 (T01) 20:03	06:59 18:53	07:49 16:52	08:31 15:22
11	08:39 15:45	07:59 17:39	07:00 18:30	06:48 20:24	05:48 21:14	20:16 (T01) 21:53	05:26 21:52	06:10 21:08	20:23 (T01) 20:00	07:01 18:51	07:51 16:50	08:32 15:21
12	08:39 15:46	07:57 17:41	06:57 18:32	06:46 20:26	05:46 21:16	20:18 (T01) 21:54	05:27 21:52	06:12 21:06	20:23 (T01) 19:58	07:02 18:49	07:52 16:48	08:33 15:22
13	08:38 15:48	07:55 17:43	06:55 18:34	06:44 20:27	05:44 21:18	05:14 21:55	05:28 21:51	06:13 21:04	20:24 (T01) 19:59	07:04 18:46	07:54 16:47	08:34 15:22
14	08:37 15:49	07:53 17:46	06:53 18:36	06:42 20:29	05:43 21:19	05:13 21:55	05:29 21:50	06:15 21:02	20:25 (T01) 19:53	07:06 18:44	07:56 16:45	08:35 15:22
15	08:37 15:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	20:18 (T01) 21:56	05:31 21:49	06:16 21:00	20:26 (T01) 19:51	07:07 18:42	07:57 16:44	08:36 15:22
16	08:36 15:52	07:49 17:48	06:48 18:39	06:37 20:32	05:40 21:22	05:19 21:57	05:32 21:46	06:18 20:58	20:27 (T01) 19:49	07:08 18:40	07:58 16:42	08:37 15:22
17	08:35 15:54	07:47 17:50	06:46 18:41	06:35 20:34	05:38 21:24	05:18 21:57	05:33 21:47	06:20 20:56	20:28 (T01) 19:46	07:10 18:38	08:01 16:41	08:38 15:22
18	08:34 15:55	07:45 17:52	06:44 18:43	06:33 20:36	05:37 21:25	05:17 21:57	05:33 21:46	06:20 20:54	20:29 (T01) 19:44	07:12 18:35	08:03 16:40	08:39 15:23
19	08:33 15:57	07:43 17:54	06:41 18:44	06:31 20:38	05:35 21:27	05:16 21:58	05:34 21:44	06:20 20:52	20:30 (T01) 19:42	07:13 18:33	08:04 16:39	08:40 15:23
20	08:32 15:59	07:41 17:56	06:39 18:46	06:28 20:39	05:34 21:28	05:15 21:58	05:34 21:44	06:21 20:50	20:31 (T01) 19:39	07:14 18:31	08:05 16:37	08:41 15:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	05:14 21:58	05:35 21:42	06:22 20:48	20:32 (T01) 19:37	07:15 18:29	08:06 16:36	08:42 15:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	05:31 21:31	05:13 21:59	05:36 21:41	06:23 20:46	20:33 (T01) 19:35	07:16 18:27	08:07 16:35	08:43 15:24
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24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	05:11 21:59	05:42 21:38	06:25 20:41	20:35 (T01) 19:30	07:18 18:23	08:09 16:33	08:45 15:25
25	08:25 17:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	05:10 21:59	05:44 21:37	06:26 20:39	20:36 (T01) 19:28	07:19 18:21	08:10 16:32	08:46 15:26
26	08:24 17:09	07:29 18:07	06:25 18:56	06:16 20:49	05:26 21:37	05:09 21:59	05:45 21:36	06:27 20:37	20:37 (T01) 19:25	07:20 18:19	08:11 16:31	08:47 15:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	05:25 21:38	05:08 21:59	05:47 21:34	06:28 20:35	20:38 (T01) 19:23	07:21 18:17	08:12 16:30	08:48 15:27
28	08:22 17:13	07:24 18:11	06:20 19:00	06:12 20:53	05:24 21:39	05:07 21:59	05:48 21:32	06:29 20:32	20:39 (T01) 19:21	07:22 18:15	08:13 16:29	08:49 15:28
29	08:20 17:15	07:18 18:02	06:18 20:02	06:10 20:55	05:23 21:41	05:06 21:59	05:49 21:31	06:30 20:30	20:40 (T01) 19:18	07:23 18:13	08:14 16:28	08:50 15:29
30	08:19 17:17	07:16 18:03	06:16 20:03	06:08 20:56	05:22 21:42	05:05 21:58	05:51 21:29	06:31 20:28	20:41 (T01) 19:16	07:24 18:11	08:15 16:27	08:51 15:30
31	08:17 17:19	07:13 18:05	06:13 20:05	06:05 20:57	05:21 21:43	05:04 21:58	05:53 21:28	06:32 20:26	20:42 (T01) 19:15	07:25 18:10	08:16 16:26	08:52 15:31
Potential sun hours	288	277	367	416	486	500	503	454	381	331	268	243
Total, worst case				25	173			197				
Sun reduction				0.34	0.34			0.30				
Oper. time red.				0.96	0.96			0.96				
Wind dir. red.				0.62	0.62			0.62				
Total reduction				0.20	0.20			0.18				
Total, real				5	35			35				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Sun set (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	(WTG causing flicker first time)	(WTG causing flicker last time)
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Project:

Moneygorm Wind Farm

Printed/Date:

18/08/2011 09:45

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H21 - H21

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:11 20:07	06:06 20:58	05:20 21:44	05:17 21:58	05:54 21:26	20:36 (T01) 20:23	06:44 19:14	07:34 17:07	08:19 16:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:09 20:08	06:04 21:00	05:20 21:45	05:18 21:58	05:58 21:24	20:34 (T01) 20:21	06:46 19:11	07:35 17:05	08:20 16:26
3	08:43 16:34	08:13 17:24	07:18 18:16	07:06 20:10	06:02 21:01	20:29 (T01) 21:46	05:19 21:57	05:57 21:23	20:36 (T01) 20:19	06:48 19:09	07:37 17:04	08:21 16:25
4	08:43 16:36	08:11 17:26	07:15 18:18	07:04 20:12	06:00 21:03	20:27 (T01) 21:47	05:18 21:57	05:59 21:21	20:34 (T01) 20:17	06:48 19:07	07:39 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	20:26 (T01) 21:48	05:17 21:56	05:57 21:19	20:36 (T01) 20:14	06:51 19:04	07:40 17:00	08:25 16:24
6	08:42 16:38	08:06 17:30	07:11 18:21	07:00 20:15	05:57 21:06	20:26 (T01) 21:49	05:17 21:56	05:57 21:17	20:34 (T01) 20:12	06:52 19:02	07:42 16:58	08:26 16:24
7	08:42 16:39	08:06 17:32	07:09 18:23	06:57 20:17	05:55 21:08	20:25 (T01) 21:50	05:16 21:55	05:57 21:15	20:35 (T01) 20:10	06:54 19:00	07:44 16:56	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	06:55 20:18	05:53 21:10	20:24 (T01) 21:51	05:16 21:55	05:55 21:14	20:36 (T01) 20:07	06:56 18:58	07:45 16:55	08:28 16:23
9	08:41 16:42	08:02 17:36	07:04 18:27	06:53 20:20	05:51 21:11	20:25 (T01) 21:52	05:15 21:54	05:54 21:12	20:37 (T01) 20:05	06:57 18:55	07:47 16:55	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:28	06:51 20:22	05:49 21:13	20:24 (T01) 21:53	05:15 21:53	05:53 21:10	20:39 (T01) 20:03	06:59 18:53	07:48 16:54	08:31 16:22
11	08:39 16:45	07:59 17:39	07:00 18:30	06:46 20:24	05:46 21:14	20:25 (T01) 21:53	05:14 21:52	05:52 21:08	20:41 (T01) 20:00	07:01 18:51	07:51 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:57 18:32	06:46 20:26	05:46 21:16	20:25 (T01) 21:54	05:14 21:52	05:52 21:06	20:41 (T01) 20:03	07:02 18:51	07:52 16:49	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	05:44 21:18	20:25 (T01) 21:55	05:14 21:51	05:51 21:04	20:41 (T01) 20:03	07:04 18:50	07:54 16:47	08:34 16:22
14	08:37 16:49	07:53 17:45	06:53 18:36	06:42 20:29	05:43 21:19	20:27 (T01) 21:55	05:13 21:50	05:49 21:02	20:41 (T01) 20:03	07:06 18:44	07:56 16:45	08:35 16:22
15	08:37 16:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	20:28 (T01) 21:56	05:13 21:49	05:48 21:00	20:41 (T01) 20:03	07:07 18:42	07:57 16:44	08:36 16:22
16	08:36 16:52	07:49 17:48	06:48 18:39	06:37 20:32	05:40 21:22	20:30 (T01) 21:57	05:13 21:48	05:47 20:58	20:41 (T01) 20:03	07:09 18:40	07:58 16:42	08:37 16:22
17	08:35 16:54	07:47 17:50	06:46 18:41	06:35 20:34	05:38 21:24	20:31 (T01) 21:57	05:13 21:47	05:46 20:50	20:41 (T01) 20:03	07:10 18:38	08:01 16:41	08:38 16:22
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	05:37 21:25	20:32 (T01) 21:57	05:13 21:46	05:45 20:54	20:41 (T01) 20:03	07:12 18:35	08:03 16:40	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	05:35 21:27	20:33 (T01) 21:58	05:13 21:44	05:44 20:52	20:41 (T01) 20:03	07:14 18:33	08:04 16:39	08:39 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:28 20:39	05:34 21:28	20:34 (T01) 21:58	05:13 21:43	05:43 20:52	20:41 (T01) 20:03	07:15 18:31	08:05 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	20:35 (T01) 21:58	05:13 21:42	05:42 20:50	20:41 (T01) 20:03	07:17 18:29	08:06 16:36	08:40 16:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	05:31 21:31	20:36 (T01) 21:59	05:13 21:41	05:41 20:58	20:41 (T01) 20:03	07:19 18:27	08:07 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	05:30 21:33	20:37 (T01) 21:59	05:14 21:39	05:40 20:56	20:41 (T01) 20:03	07:20 18:25	08:08 16:34	08:42 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	05:29 21:34	20:38 (T01) 21:59	05:14 21:38	05:39 20:54	20:41 (T01) 20:03	07:22 18:23	08:10 16:33	08:43 16:25
25	08:28 17:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	20:39 (T01) 21:59	05:14 21:37	05:38 20:59	20:41 (T01) 20:03	07:24 18:21	08:11 16:32	08:44 16:25
26	08:24 17:09	07:29 18:07	06:25 18:58	06:16 20:49	05:26 21:37	20:40 (T01) 21:59	05:15 21:35	05:37 20:57	20:41 (T01) 20:03	07:25 18:20	08:12 16:31	08:42 16:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	05:25 21:38	20:41 (T01) 21:59	05:15 21:34	05:36 20:55	20:41 (T01) 20:03	07:27 18:19	08:13 16:30	08:42 16:27
28	08:22 17:13	07:24 18:11	06:20 19:00	06:12 20:53	05:24 21:39	20:42 (T01) 21:59	05:16 21:32	05:35 20:54	20:41 (T01) 20:03	07:29 18:17	08:14 16:29	08:43 16:28
29	08:20 17:15	07:18 18:15	06:18 19:02	06:10 20:55	05:23 21:41	20:43 (T01) 21:59	05:16 21:31	05:34 20:53	20:41 (T01) 20:03	07:30 18:15	08:15 16:28	08:43 16:29
30	08:19 17:17	07:16 18:13	06:16 19:03	06:08 20:56	05:22 21:42	20:44 (T01) 21:58	05:17 21:29	05:33 20:52	20:41 (T01) 20:03	07:32 18:14	08:16 16:27	08:43 16:30
31	08:17 17:19	07:13 18:05	06:13 19:05	06:05 21:43	05:21 21:43	20:45 (T01) 21:28	05:18 21:26	05:32 20:51	20:41 (T01) 20:03	07:34 18:13	08:17 16:27	08:43 16:31
Potential sun hours	258	277	367	416	488	500	503	454	381	331	266	243
Total, worst case					156		39	115				
Sun reduction					0.34		0.29	0.30				
Oper. time red.					0.96		0.96	0.96				
Wind dir. red.					0.63		0.63	0.63				
Total reduction					0.20		0.17	0.18				
Total, real					32		7	21				

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Moneygorm Wind Farm

Printed Page
18/08/2011 09:45 / 22

Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H22 - H22

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum

354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 6,900
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December	
1	08:43 18:32	08:15 17:20	07:22 16:12	07:11 20:07	06:06 20:58		05:20 21:44	05:17 21:58	05:54 21:28	20:38 (T01) 20:23	07:34 18:14	07:28 17:07	08:19 16:27
2	08:43 18:33	08:14 17:22	07:20 16:14	07:09 20:08	05:04 21:00	20:29 (T01) 20:31 (T01)	05:20 21:45	05:18 21:58	05:56 21:24	20:36 (T01) 20:21	07:35 16:11	07:30 17:05	08:20 16:26
3	08:43 18:34	08:13 17:24	07:18 16:16	07:06 20:10	05:02 21:01	20:27 (T01) 20:33 (T01)	05:19 21:46	05:19 21:57	05:57 21:23	20:36 (T01) 20:19	07:37 16:08	07:31 17:04	08:22 16:25
4	08:42 18:36	08:11 17:26	07:15 16:18	07:04 20:12	05:00 21:03	20:26 (T01) 20:34 (T01)	05:18 21:47	05:20 21:57	05:59 21:21	20:36 (T01) 20:17	07:39 16:07	07:33 17:02	08:23 16:25
5	08:42 18:37	08:09 17:28	07:13 16:20	07:02 20:14	05:58 21:05	20:25 (T01) 20:35 (T01)	05:17 21:48	05:20 21:56	06:00 21:19	20:36 (T01) 20:14	07:40 16:04	07:35 17:00	08:25 16:24
6	08:42 18:38	08:08 17:30	07:11 16:21	07:00 20:15	05:57 21:06	20:26 (T01) 20:37 (T01)	05:17 21:49	05:21 21:56	06:02 21:17	20:36 (T01) 20:12	07:42 16:02	07:37 16:58	08:26 16:24
7	08:42 18:39	08:06 17:32	07:08 16:23	06:57 20:17	05:55 21:08	20:25 (T01) 20:39 (T01)	05:16 21:50	05:22 21:55	06:04 21:15	20:36 (T01) 20:10	07:44 16:00	07:39 16:55	08:27 16:23
8	08:41 18:41	08:04 17:33	07:07 16:25	06:55 20:19	05:53 21:10	20:25 (T01) 20:39 (T01)	05:16 21:51	05:23 21:55	06:05 21:14	20:36 (T01) 20:07	07:45 16:58	07:40 16:55	08:28 16:23
9	08:41 18:42	08:02 17:35	07:04 16:27	06:53 20:20	05:51 21:11	20:26 (T01) 20:39 (T01)	05:15 21:52	05:24 21:54	06:07 21:12	20:36 (T01) 20:05	07:47 16:55	07:42 16:53	08:30 16:23
10	08:40 18:43	08:01 17:37	07:02 16:28	06:51 20:22	05:49 21:13	20:26 (T01) 20:38 (T01)	05:15 21:53	05:25 21:53	06:08 21:10	20:36 (T01) 20:03	07:48 16:53	07:44 16:51	08:31 16:22
11	08:39 18:45	07:59 17:39	07:00 16:30	06:48 20:24	05:48 21:14	20:27 (T01) 20:38 (T01)	05:14 21:53	05:26 21:52	06:10 21:08	20:38 (T01) 20:01	07:51 16:51	07:46 16:50	08:32 16:22
12	08:39 18:46	07:57 17:41	06:57 16:32	06:46 20:25	05:46 21:15	20:27 (T01) 20:38 (T01)	05:14 21:52	05:27 21:52	06:12 21:06	20:39 (T01) 20:00	07:52 16:51	07:48 16:48	08:33 16:22
13	08:38 18:48	07:55 17:43	06:55 16:34	06:44 20:27	05:44 21:18	20:28 (T01) 20:38 (T01)	05:14 21:51	05:27 21:51	06:13 21:04	20:39 (T01) 20:00	07:54 16:51	07:49 16:47	08:34 16:22
14	08:37 18:49	07:53 17:45	06:53 16:36	06:42 20:29	05:43 21:19	20:29 (T01) 20:39 (T01)	05:13 21:50	05:28 21:50	06:15 21:02	20:39 (T01) 20:00	07:56 16:51	07:51 16:46	08:35 16:22
15	08:37 18:51	07:51 17:47	06:51 16:37	06:39 20:31	05:41 21:21	20:30 (T01) 20:39 (T01)	05:13 21:49	05:29 21:48	06:16 21:00	20:40 (T01) 20:00	07:57 16:51	07:53 16:44	08:36 16:22
16	08:36 18:52	07:49 17:48	06:48 16:38	06:37 20:32	05:40 21:22	20:31 (T01) 20:39 (T01)	05:13 21:48	05:30 21:48	06:18 20:58	20:41 (T01) 20:00	07:59 16:51	07:55 16:42	08:37 16:22
17	08:35 18:54	07:47 17:50	06:46 16:41	06:35 20:34	05:38 21:24	20:32 (T01) 20:39 (T01)	05:13 21:47	05:31 21:47	06:20 20:56	20:42 (T01) 20:00	08:01 16:51	07:58 16:41	08:37 16:22
18	08:34 18:56	07:45 17:52	06:44 16:43	06:33 20:36	05:37 21:25	20:33 (T01) 20:39 (T01)	05:13 21:46	05:32 21:46	06:21 20:54	20:43 (T01) 20:00	08:03 16:51	07:58 16:40	08:38 16:23
19	08:33 18:57	07:43 17:54	06:41 16:44	06:31 20:38	05:35 21:27	20:34 (T01) 20:39 (T01)	05:13 21:44	05:33 21:44	06:23 20:52	20:44 (T01) 20:00	08:04 16:51	08:00 16:39	08:39 16:23
20	08:32 18:59	07:41 17:56	06:39 16:46	06:28 20:39	05:34 21:28	20:35 (T01) 20:39 (T01)	05:13 21:43	05:34 21:43	06:25 20:50	20:45 (T01) 20:00	08:06 16:51	08:02 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 16:48	06:26 20:41	05:33 21:30	20:36 (T01) 20:39 (T01)	05:13 21:42	05:35 21:42	06:26 20:48	20:46 (T01) 20:00	08:08 16:51	08:03 16:36	08:40 16:24
22	08:29 17:02	07:37 18:00	06:34 16:49	06:24 20:43	05:31 21:31	20:37 (T01) 20:39 (T01)	05:13 21:41	05:36 21:41	06:28 20:45	20:47 (T01) 20:00	08:10 16:51	08:05 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 16:51	06:22 20:44	05:30 21:33	20:38 (T01) 20:39 (T01)	05:13 21:39	05:37 21:39	06:30 20:43	20:48 (T01) 20:00	08:12 16:51	08:07 16:34	08:41 16:25
24	08:27 17:06	07:33 18:03	06:30 16:53	06:20 20:46	05:29 21:34	20:39 (T01) 20:39 (T01)	05:13 21:38	05:38 21:38	06:31 20:41	20:49 (T01) 20:00	08:13 16:51	08:08 16:33	08:42 16:25
25	08:26 17:08	07:31 18:05	06:27 16:55	06:18 20:48	05:28 21:35	20:40 (T01) 20:39 (T01)	05:13 21:37	05:39 21:37	06:33 20:43	20:50 (T01) 20:00	08:14 16:51	08:09 16:32	08:43 16:26
26	08:24 17:09	07:29 18:07	06:25 16:56	06:16 20:49	05:26 21:37	20:41 (T01) 20:39 (T01)	05:13 21:36	05:40 21:36	06:34 20:47	20:51 (T01) 20:00	08:15 16:51	08:11 16:31	08:42 16:27
27	08:23 17:11	07:26 18:09	06:23 16:58	06:14 20:51	05:25 21:38	20:42 (T01) 20:39 (T01)	05:13 21:34	05:41 21:34	06:36 20:49	20:52 (T01) 20:00	08:16 16:51	08:13 16:30	08:42 16:27
28	08:22 17:13	07:24 18:11	06:20 17:00	06:12 20:53	05:24 21:39	20:43 (T01) 20:39 (T01)	05:13 21:32	05:42 21:32	06:38 20:50	20:53 (T01) 20:00	08:17 16:51	08:15 16:29	08:43 16:28
29	08:20 17:15	07:18 18:20	06:16 17:05	06:10 20:55	05:23 21:40	20:44 (T01) 20:39 (T01)	05:13 21:31	05:43 21:31	06:39 20:50	20:54 (T01) 20:00	08:18 16:51	08:16 16:28	08:43 16:29
30	08:19 17:17	07:16 18:23	06:14 17:06	06:08 20:56	05:22 21:42	20:45 (T01) 20:39 (T01)	05:13 21:30	05:44 21:30	06:41 20:50	20:55 (T01) 20:00	08:19 16:51	08:18 16:27	08:43 16:30
31	08:17 17:19	07:13 18:25	06:11 17:05	06:06 20:57	05:21 21:43	20:46 (T01) 20:46 (T01)	05:13 21:28	05:45 21:28	06:43 20:26	20:56 (T01) 20:00	08:20 16:51	08:19 16:27	08:43 16:31
Potential sun hours	258	277	367	416	488	500	503	454	109	381	331	266	243
Total, worst case					113			6	0.30				
Sun reduction					0.34			0.29	0.56				
Oper. time red.					0.96			0.96	0.63				
Wind dir. red.					0.63			0.53	0.18				
Total reduction					0.20			0.17					
Total, real					23			1					



Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project:

Moneygorm Wind Farm

Printed Page

18/08/2011 09:45 3

Licensed user:

Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:

18/08/2011 09:43/2 7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H23 - H23

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:43 16:32	08:16 17:20	07:22 18:12	07:11 20:07	06:06 20:58	05:20 21:44	20:52 (T01) 21:58	05:17 21:26	05:54 20:23	06:44 19:14	07:34 17:07	07:28 15:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:09 20:08	06:04 21:00	05:20 21:45	20:52 (T01) 21:58	05:18 21:24	05:56 20:21	06:46 19:11	07:35 17:05	07:30 15:26
3	08:43 16:34	08:13 17:24	07:18 18:16	07:06 20:10	06:02 21:01	05:19 21:48	20:53 (T01) 21:57	05:19 21:04 (T01)	05:57 20:19	06:48 19:09	07:39 17:04	07:33 15:25
4	08:42 16:36	08:11 17:26	07:15 18:18	07:04 20:12	06:00 21:03	05:18 21:47	20:53 (T01) 21:57	05:18 21:04 (T01)	05:59 20:17	06:49 19:07	07:39 17:02	07:33 15:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	05:58 21:05	05:17 21:48	20:55 (T01) 21:56	05:17 21:08 (T01)	05:57 20:14	06:50 19:04	07:40 17:00	07:36 15:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	05:57 21:06	05:17 21:49	20:55 (T01) 21:56	05:17 21:10 (T01)	05:52 20:12	06:52 19:02	07:42 16:58	07:37 15:24
7	08:42 16:39	08:08 17:32	07:09 18:23	06:57 20:17	05:55 21:08	05:16 21:50	20:56 (T01) 21:55	05:16 21:11 (T01)	05:54 20:10	06:54 19:00	07:44 16:56	07:39 15:23
8	08:41 16:41	08:04 17:37	07:07 18:25	06:55 20:19	05:53 21:10	05:15 21:51	20:56 (T01) 21:55	05:15 21:12 (T01)	05:56 20:07	06:56 18:58	07:45 16:55	07:40 15:23
9	08:41 16:42	08:02 17:41	07:04 18:27	06:53 20:20	05:51 21:11	05:15 21:52	20:58 (T01) 21:54	05:15 21:12 (T01)	06:07 20:06	06:57 18:55	07:47 16:53	07:42 15:23
10	08:40 16:43	08:01 17:43	07:02 18:28	06:51 20:22	05:49 21:13	05:15 21:53	21:03 (T01) 21:53	05:15 21:13 (T01)	06:08 20:03	06:59 18:53	07:49 16:52	07:44 15:22
11	08:39 16:45	07:59 17:46	07:00 18:30	06:48 20:24	05:48 21:14	05:14 21:53	21:01 (T01) 21:52	05:14 21:13 (T01)	06:10 20:00	07:01 18:51	07:51 16:50	07:46 15:22
12	08:39 16:46	07:57 17:49	06:57 18:32	06:46 20:25	05:48 21:16	05:14 21:54	21:02 (T01) 21:52	05:14 21:14 (T01)	06:12 19:58	07:02 18:49	07:52 16:48	07:48 15:22
13	08:38 16:48	07:55 17:53	06:55 18:34	06:44 20:27	05:44 21:18	05:14 21:55	21:03 (T01) 21:54	05:14 21:14 (T01)	06:13 19:56	07:04 18:46	07:54 16:47	07:49 15:22
14	08:37 16:49	07:53 17:56	06:53 18:36	06:42 20:29	05:43 21:19	05:13 21:55	21:04 (T01) 21:53	05:13 21:14 (T01)	06:15 19:53	07:06 18:44	07:56 16:45	07:51 15:22
15	08:37 16:51	07:51 17:47	06:51 18:37	06:39 20:31	05:41 21:21	05:13 21:56	21:05 (T01) 21:52	05:13 21:14 (T01)	06:16 19:51	07:07 18:42	07:57 16:44	07:53 15:22
16	08:35 16:52	07:49 17:48	06:48 18:39	06:37 20:32	05:40 21:22	05:13 21:57	21:06 (T01) 21:51	05:13 21:14 (T01)	06:18 19:49	07:09 18:40	07:59 16:42	07:55 15:22
17	08:35 16:54	07:47 17:50	06:45 18:41	06:35 20:34	05:38 21:24	05:13 21:57	21:07 (T01) 21:57	05:13 21:14 (T01)	06:20 19:46	07:10 18:38	07:56 16:41	07:56 15:22
18	08:34 16:56	07:46 17:52	06:44 18:43	06:33 20:36	05:37 21:25	05:13 21:57	21:08 (T01) 21:57	05:13 21:14 (T01)	06:21 19:44	07:12 18:35	07:58 16:40	07:58 15:22
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	05:36 21:27	05:13 21:58	21:09 (T01) 21:58	05:13 21:14 (T01)	06:22 19:42	07:14 18:33	08:00 16:39	08:00 15:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:28 20:39	05:34 21:28	05:13 21:58	21:10 (T01) 21:58	05:13 21:14 (T01)	06:23 19:39	07:15 18:31	08:02 16:37	08:02 15:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	05:33 21:30	05:13 21:58	21:11 (T01) 21:58	05:13 21:14 (T01)	06:24 19:37	07:16 18:29	08:03 16:36	08:03 15:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	05:31 21:31	05:13 21:59	21:12 (T01) 21:59	05:13 21:14 (T01)	06:25 19:36	07:17 18:27	08:04 16:35	08:04 15:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	05:30 21:33	05:13 21:59	21:13 (T01) 21:59	05:13 21:14 (T01)	06:26 19:34	07:18 18:25	08:05 16:34	08:05 15:25
24	08:27 17:06	07:33 18:09	06:30 18:53	06:20 20:46	05:29 21:34	05:13 21:59	21:14 (T01) 21:59	05:13 21:14 (T01)	06:27 19:33	07:19 18:23	08:06 16:33	08:06 15:26
25	08:26 17:08	07:31 18:05	06:27 18:55	06:18 20:48	05:28 21:35	05:13 21:59	21:15 (T01) 21:59	05:13 21:14 (T01)	06:28 19:32	07:20 18:22	08:07 16:32	08:07 15:26
26	08:24 17:09	07:29 18:07	06:25 18:58	06:16 20:49	05:26 21:37	05:13 21:59	21:16 (T01) 21:59	05:13 21:14 (T01)	06:29 19:31	07:21 18:21	08:08 16:31	08:08 15:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	05:25 21:38	05:13 21:59	21:17 (T01) 21:59	05:13 21:14 (T01)	06:30 19:30	07:22 18:20	08:09 16:30	08:09 15:27
28	08:22 17:13	07:24 18:11	06:20 18:00	06:12 20:53	05:24 21:39	05:13 21:59	21:18 (T01) 21:59	05:13 21:14 (T01)	06:31 19:29	07:23 18:19	08:10 16:29	08:10 15:28
29	08:20 17:15	07:18 18:11	06:18 20:02	06:10 20:55	05:23 21:40	05:13 21:59	21:19 (T01) 21:59	05:13 21:14 (T01)	06:32 19:28	07:24 18:18	08:11 16:28	08:11 15:29
30	08:19 17:17	07:16 18:08	06:16 20:03	06:08 20:56	05:22 21:42	05:13 21:58	21:20 (T01) 21:58	05:13 21:14 (T01)	06:33 19:27	07:25 18:17	08:12 16:27	08:12 15:30
31	08:17 17:19	07:13 18:06	06:13 20:05	06:01 20:57	05:21 21:43	05:13 21:58	21:21 (T01) 21:58	05:13 21:14 (T01)	06:34 19:26	07:26 18:09	08:13 16:27	08:13 15:31
Potential sun hours	258	277	367	416	488	500	503	454	381	331	266	243
Total, worst case					136	90	224					
Sun reduction					0.34	0.30	0.29					
Oper. time red.					0.60	0.60	0.60					
Wind dr. red.					0.64	0.64	0.64					
Total reduction					0.21	0.18	0.18					
Total, real					28	16	39					

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

Project: Moneygorm Wind Farm

Printed Page: 18/08/2011 09:45 / 24

Licensed user: Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated: 18/08/2011 09:43/2.7.486

SHADOW - Calendar

Calculation: MYGM Shadow Flicker V52Shadow receptor: H24 - H24

Assumptions for shadow calculations

Maximum distance for influence 2,000 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) [KILKENNY]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1.68 2.20 3.08 4.72 5.31 4.94 4.67 4.36 3.78 2.74 2.15 1.32

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
354 290 332 331 441 908 867 1,275 1,023 1,139 816 612 8,388

Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:45 16:32	08:16 17:20	07:22 18:12	07:11 20:07	06:06 20:58	05:20 21:44	05:17 21:58	05:54 21:26	08:44 20:23	07:34 19:14	07:28 17:07	08:19 16:27
2	08:43 16:33	08:14 17:22	07:20 18:14	07:09 20:06	06:04 21:00	05:20 21:45	05:18 21:58	05:56 21:24	08:46 20:21	07:35 19:11	07:30 17:05	08:20 16:26
3	08:43 16:34	08:13 17:24	07:16 18:16	07:06 20:10	06:02 21:01	05:19 21:46	05:19 21:57	05:57 21:23	08:48 20:19	07:37 19:09	07:31 17:04	08:22 16:25
4	08:42 16:36	08:11 17:26	07:15 18:18	07:04 20:12	06:00 21:03	05:18 21:47	05:20 21:57	05:59 21:21	08:49 20:17	07:39 19:07	07:33 17:02	08:23 16:25
5	08:42 16:37	08:09 17:28	07:13 18:20	07:02 20:14	06:58 21:05	06:17 21:48	06:20 21:56	06:00 21:19	08:51 20:14	07:40 19:04	07:35 17:00	08:25 16:24
6	08:42 16:38	08:08 17:30	07:11 18:21	07:00 20:15	06:57 21:06	06:17 21:49	06:21 21:56	06:02 21:17	08:52 20:12	07:42 19:02	07:37 16:58	08:26 16:24
7	08:42 16:39	08:06 17:32	07:09 18:23	06:57 20:17	06:55 21:06	06:16 21:50	06:22 21:55	06:04 21:15	08:54 20:10	07:44 19:00	07:39 16:56	08:27 16:23
8	08:41 16:41	08:04 17:33	07:07 18:25	06:55 20:19	06:53 21:10	06:16 21:51	06:23 21:55	06:05 21:14	08:56 20:07	07:45 18:58	07:40 16:55	08:28 16:23
9	08:41 16:42	08:02 17:35	07:04 18:27	06:53 20:20	06:51 21:11	06:15 21:52	06:25 21:54	06:07 21:12	08:57 20:05	07:47 18:55	07:42 16:53	08:30 16:23
10	08:40 16:43	08:01 17:37	07:02 18:28	06:51 20:22	06:50 21:13	06:15 21:53	06:25 21:53	06:08 21:10	08:59 20:03	07:49 18:53	07:44 16:52	08:31 16:22
11	08:39 16:45	07:59 17:39	07:00 18:30	06:48 20:24	06:48 21:14	06:14 21:53	06:26 21:52	06:10 21:08	09:01 20:00	07:51 18:51	07:46 16:50	08:32 16:22
12	08:39 16:46	07:57 17:41	06:57 18:32	06:46 20:26	06:46 21:16	06:14 21:54	06:27 21:52	06:12 21:06	09:02 19:58	07:52 18:49	07:48 16:48	08:33 16:22
13	08:38 16:48	07:55 17:43	06:55 18:34	06:44 20:27	06:45 21:18	06:14 21:55	06:28 21:51	06:13 21:04	09:04 19:56	07:54 18:46	07:49 16:47	08:34 16:22
14	08:37 16:49	07:53 17:45	06:53 18:36	06:42 20:29	06:43 21:19	06:13 21:55	06:29 21:50	06:15 21:02	09:06 19:53	07:56 18:44	07:51 16:45	08:35 16:22
15	08:37 16:51	07:51 17:47	06:51 18:37	06:39 20:31	06:41 21:21	06:13 21:56	06:31 21:49	06:16 21:00	09:07 19:51	07:57 18:42	07:53 16:44	08:36 16:22
16	08:36 16:52	07:49 17:48	06:48 18:39	06:37 20:32	06:40 21:22	06:13 21:57	06:32 21:48	06:18 20:58	09:09 19:49	07:59 18:40	07:55 16:43	08:37 16:22
17	08:36 16:54	07:47 17:50	06:46 18:41	06:35 20:34	06:38 21:24	06:13 21:57	06:33 21:47	06:20 20:56	09:10 19:46	08:01 18:38	07:56 16:41	08:37 16:23
18	08:34 16:56	07:45 17:52	06:44 18:43	06:33 20:36	06:37 21:25	06:13 21:57	06:34 21:46	06:21 20:54	09:12 19:44	08:03 18:35	07:58 16:40	08:38 16:23
19	08:33 16:57	07:43 17:54	06:41 18:44	06:31 20:38	06:35 21:27	06:13 21:58	06:36 21:44	06:23 20:52	09:14 19:42	08:04 18:33	08:00 16:39	08:39 16:23
20	08:32 16:59	07:41 17:56	06:39 18:46	06:29 20:39	06:34 21:28	06:13 21:58	06:37 21:43	06:25 20:50	09:15 19:39	08:06 18:31	08:02 16:37	08:39 16:23
21	08:31 17:01	07:39 17:58	06:37 18:48	06:26 20:41	06:33 21:30	06:13 21:58	06:38 21:42	06:26 20:48	09:17 19:37	08:08 18:29	08:03 16:36	08:40 16:24
22	08:29 17:02	07:37 18:00	06:34 18:49	06:24 20:43	06:34 21:31	06:13 21:59	06:40 21:41	06:28 20:45	09:19 19:35	08:10 18:27	08:05 16:35	08:41 16:24
23	08:28 17:04	07:35 18:01	06:32 18:51	06:22 20:44	06:30 21:33	06:14 21:59	06:41 21:39	06:30 20:43	09:20 19:32	08:12 18:25	08:07 16:34	08:42 16:25
24	08:27 17:06	07:33 18:03	06:30 18:53	06:20 20:46	06:29 21:34	06:14 21:59	06:42 21:38	06:31 20:41	09:22 19:30	08:13 18:23	08:08 16:33	08:43 16:25
25	08:26 17:08	07:31 18:05	06:27 18:55	06:16 20:48	06:28 21:35	06:14 21:59	06:44 21:37	06:33 20:39	09:24 19:28	08:15 18:21	08:10 16:32	08:44 16:26
26	08:24 17:09	07:29 18:07	06:25 18:56	06:16 20:49	06:25 21:37	06:15 21:59	06:45 21:35	06:34 20:37	09:25 19:25	08:17 18:19	08:11 16:31	08:45 16:27
27	08:23 17:11	07:26 18:09	06:23 18:58	06:14 20:51	06:25 21:38	06:15 21:59	06:47 21:34	06:36 20:35	09:27 19:23	08:19 18:17	08:13 16:30	08:46 16:27
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29	08:20 17:15	07:18 18:02	06:16 19:02	06:08 20:55	06:23 21:40	06:16 21:59	06:50 21:31	06:39 20:30	09:30 19:18	08:22 18:13	08:16 16:28	08:48 16:29
30	08:19 17:17	07:16 18:03	06:13 19:03	06:05 20:56	06:22 21:42	06:17 21:58	06:51 21:29	06:41 20:28	09:32 19:16	08:24 18:11	08:18 16:27	08:49 16:30
31	08:17 17:19	07:13 18:05	06:09 19:05	06:01 20:57	06:21 21:43	06:18 21:58	06:53 21:28	06:43 20:26	09:34 19:09	08:26 18:07	08:20 16:31	08:50 16:31
Potential sun hours	258	277	367	416	486	500	503	454	381	331	266	243
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

Table layout: For each day in each month the following matrix apply

Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

Planning Department

20 SEP 2011

Cork County Council
County Hall
Cork

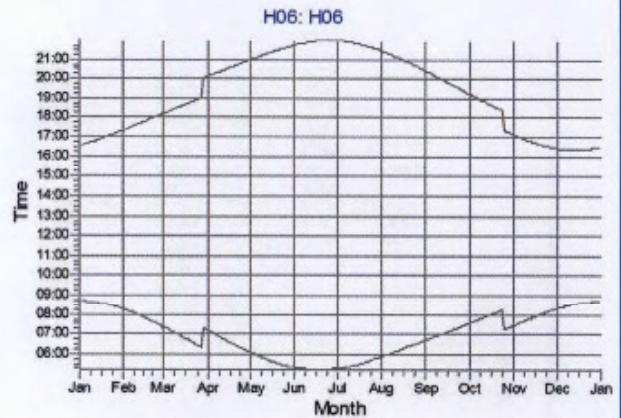
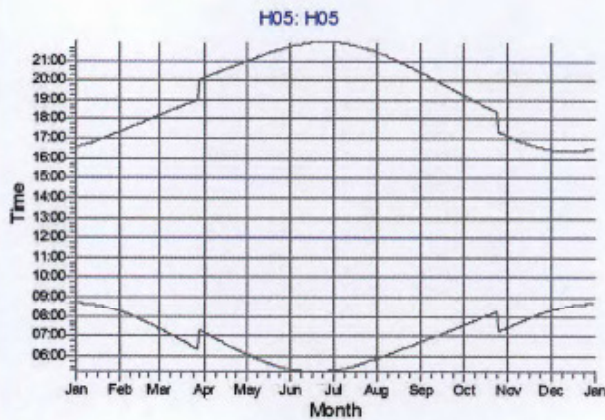
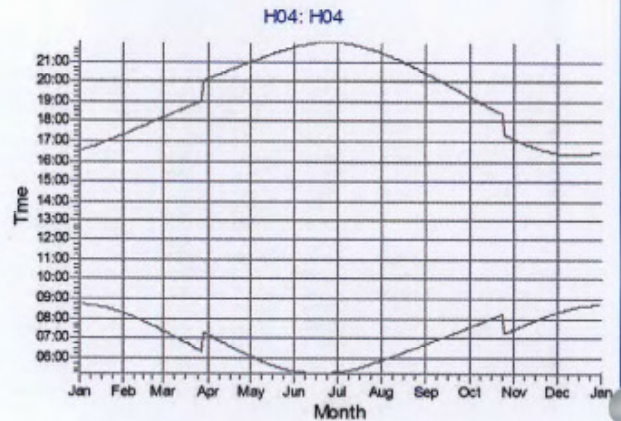
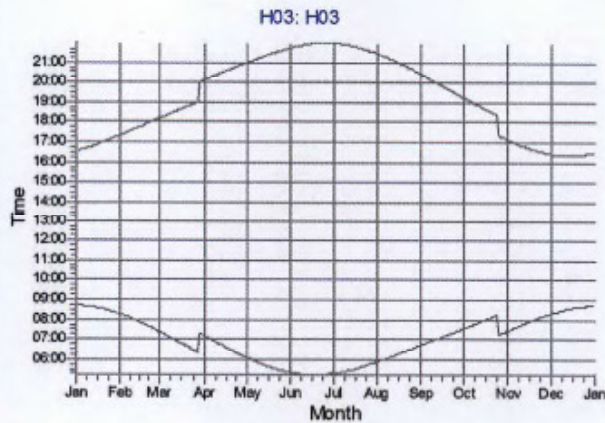
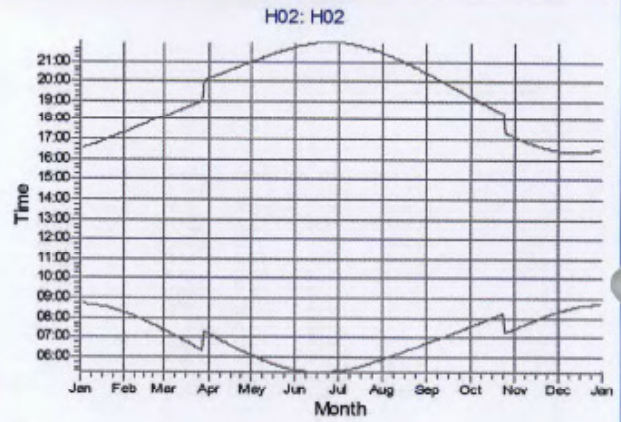
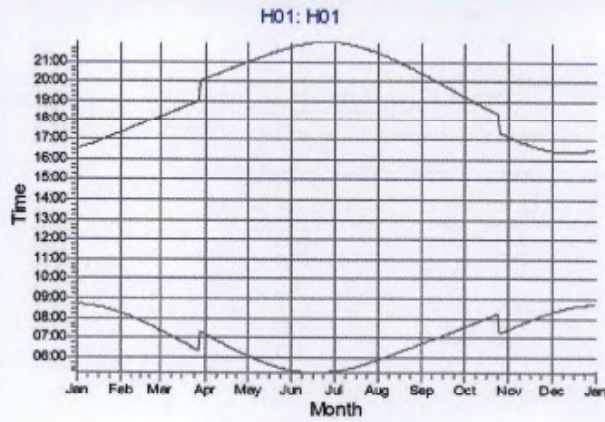
Project:
Moneygorm Wind Farm

Printed Page
18/08/2011 09:46
Licensed user:
Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar, graphical

Calculation: MYGM Shadow Flicker V52



WTGs

Moneygorm Wind Farm

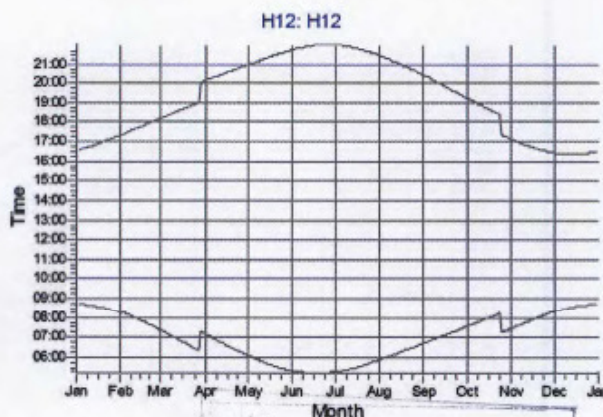
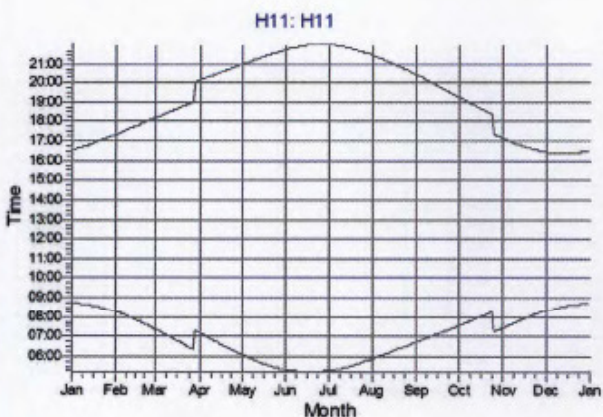
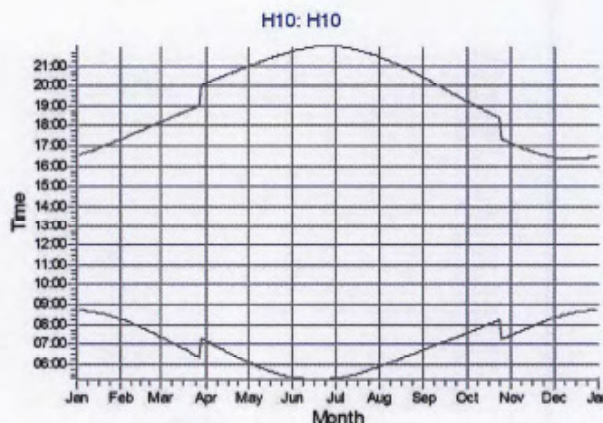
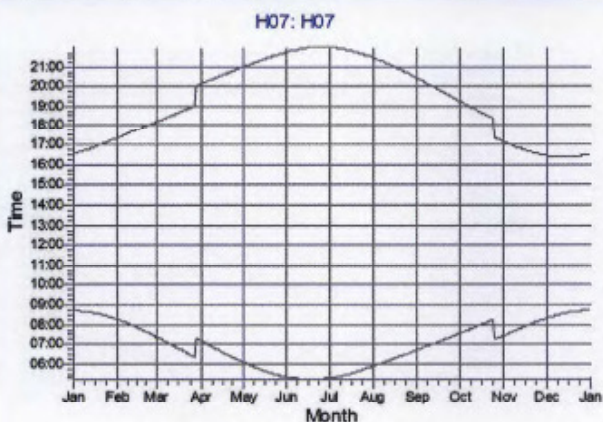
Printed Page
18/08/2011 09:46 / 2

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Wind Prospect Limited
7, Berkeley Square, Clifton
GB-BS8 1HG Bristol
+44 0117 910 5980

Calculated:
18/08/2011 09:43/2.7.486

SHADOW - Calendar, graphical

Calculation: MYGM Shadow Flicker V52



WTGs

Planning Department

20 SEP 2011

County Council
County Hall
Dun

Project:
Moneygorm Wind Farm

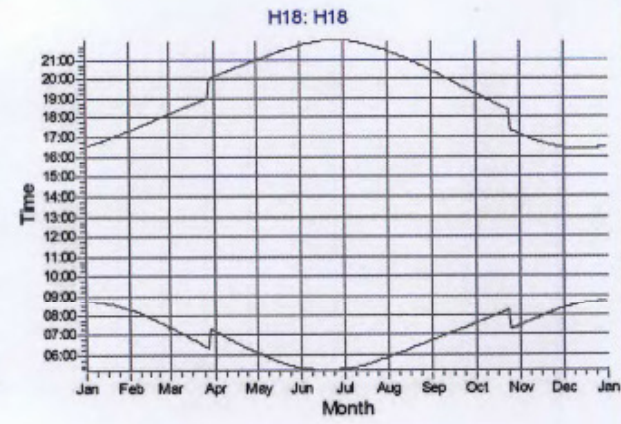
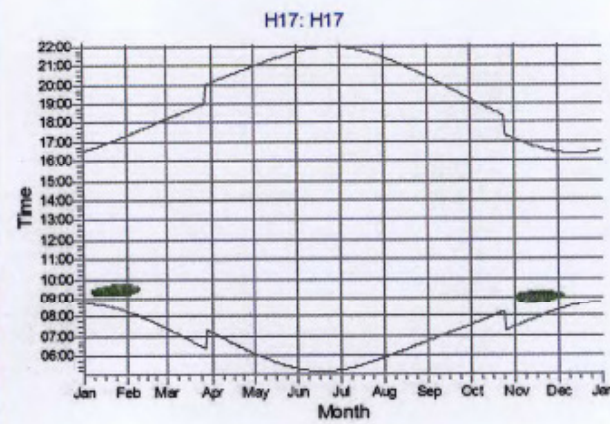
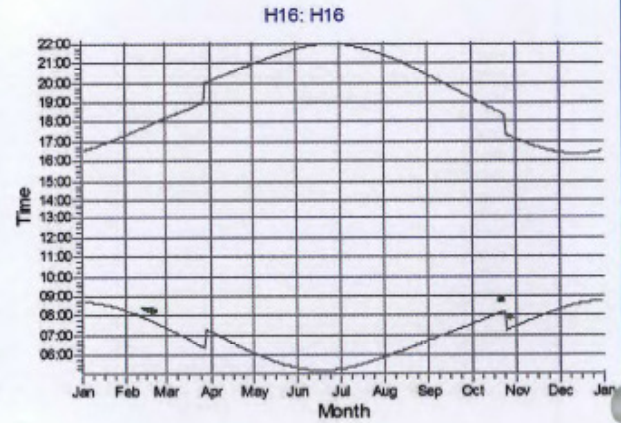
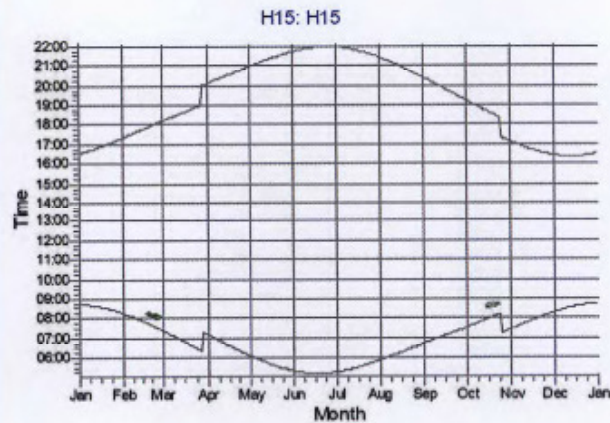
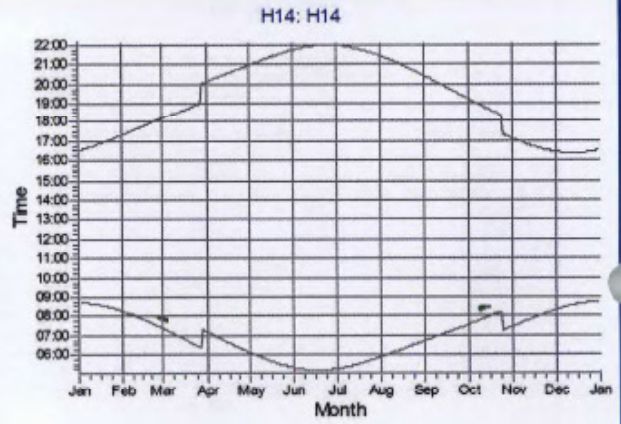
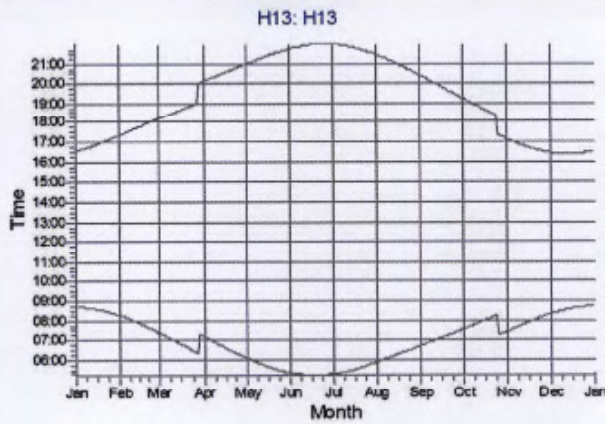
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SHADOW - Calendar, graphical

Calculation: MYGM Shadow Flicker V52



WTGs

 T01: T01