

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

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Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

Assumptions for shadow calculations

Maximum distance for influence 2 500 m
Minimum sun height over horizon for influence 3 °
Day step for calculation 1 days
Time step for calculation 1 minutes

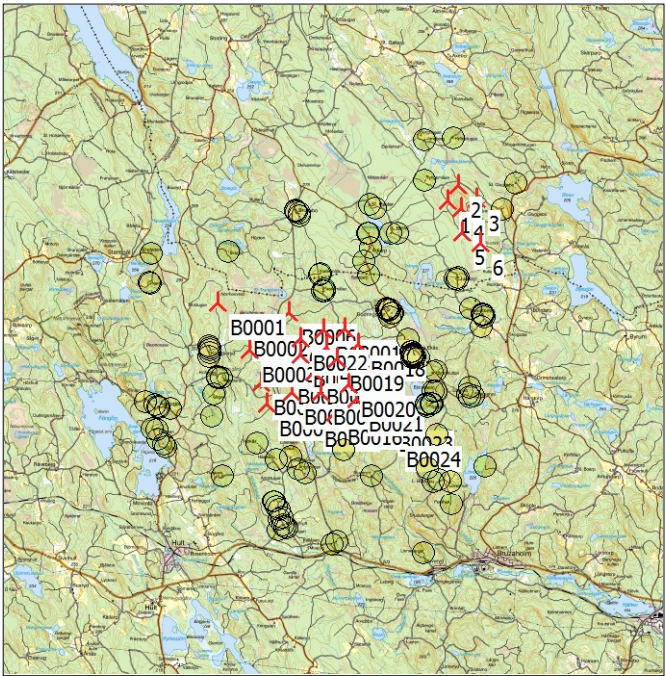
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational hours are calculated from WTGs in calculation and wind distribution:
MERRA basic windstat

Operational time
N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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: Hk 2m + 5m uttunnad(1).wpo (2)
Obstacles used in calculation
Eye height: 1,5 m
Grid resolution: 10,0 m

All coordinates are in
Swedish UTM 33-SWREF99 (SE)
WTGs



	Easting	Northing	Z	Row data/Description	WTG type		Power, rated [kW]	Rotor diameter [m]	Hub height [m]	RPM [RPM]
					Valid	Manufact. Type-generator				
			[m]							
1	514 997	6 398 414	270,0	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
2	515 264	6 398 813	276,9	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
3	515 767	6 398 461	280,0	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
4	515 359	6 398 196	295,0	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
5	515 380	6 397 585	278,8	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
6	515 878	6 397 309	280,0	VESTAS V117-3.3 GridStreame ...	Yes	VESTAS V117-3.3 GridStreame-3 300	3 300	117,0	91,5	13,1
B0001	508 955	6 395 634	304,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0002	509 578	6 395 106	297,9	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0003	509 818	6 394 408	288,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0004	510 137	6 393 543	283,1	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0005	510 278	6 393 004	272,4	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0006	510 855	6 395 411	296,0	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0007	510 722	6 394 840	320,0	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0008	510 635	6 394 303	293,0	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0009	510 751	6 393 844	287,9	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0010	510 949	6 393 306	285,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0011	511 497	6 392 734	292,6	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0012	511 765	6 394 956	319,7	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0013	511 169	6 394 293	303,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0014	511 531	6 393 841	301,5	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0015	511 719	6 393 313	282,0	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0016	512 083	6 392 781	280,3	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0017	512 320	6 394 988	300,3	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0018	512 675	6 394 596	291,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0019	512 129	6 394 208	294,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0020	512 429	6 393 526	307,6	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0021	512 650	6 393 145	298,9	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0022	511 169	6 394 721	306,6	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0023	513 435	6 392 637	293,1	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0024	513 641	6 392 235	305,4	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3
B0025	511 834	6 394 512	304,8	NORDEX N131/3000 3000 131....	Yes	NORDEX N131/3000-3 000	3 000	131,0	144,5	10,3

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

Shadow receptor-Input

No.	Easting	Northing	Z	Width	Height	Height a.g.l.	Degrees from south cw	Slope of window	Direction mode
			[m]	[m]	[m]	[m]	[°]	[°]	
ARKARP 1:3>1	512 931	6 397 530	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ARKARP 1:3>1	512 911	6 397 520	275,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ARKARP 1:5>1	512 809	6 396 770	296,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ARKARP 1:5>1	512 817	6 396 790	294,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BOGÅRD 6:29>1	509 150	6 391 080	247,4	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BOGÅRD 6:30>1	507 637	6 391 820	224,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BOGÅRD 6:32>1	507 579	6 391 910	228,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:11>1	512 941	6 398 280	272,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:12>1	511 104	6 397 950	275,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:13>1	512 978	6 397 140	280,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:19>1	509 237	6 396 990	311,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:3>1	511 011	6 398 050	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:6>1	510 993	6 398 080	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:7>1	510 983	6 398 110	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
BROKABO 1:8>1	511 088	6 398 020	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÅNHULT 1:2>1	515 592	6 393 320	260,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:4>1	513 460	6 395 490	312,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:4>1	513 507	6 395 520	310,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:4>1	513 481	6 395 500	311,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:5>1	513 501	6 395 330	308,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:5>1	513 521	6 395 310	308,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:7>1	513 577	6 395 420	306,4	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:7>1	513 561	6 395 430	307,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
DÖDRINGSHULT 1:8>1	513 444	6 395 540	312,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
Grevekulla	516 437	6 398 203	265,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
Grevekulla 1:11	514 393	6 398 932	270,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:10>2	514 751	6 393 900	278,1	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:13>1	515 990	6 395 350	284,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:15>1	514 655	6 393 880	277,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:16>1	515 635	6 395 560	298,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:17>1	515 972	6 395 400	285,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:17>1	515 969	6 395 420	285,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 1:6>1	515 940	6 395 430	284,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 3:1>1	515 646	6 393 480	272,4	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HUSTOMTA 3:1>1	515 925	6 395 090	288,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
Hyltestugan	515 116	6 400 070	255,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄRSTORP 1:13>1	516 070	6 391 410	228,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄSSLEÅS 1:11>1	511 319	6 391 170	273,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄSSLEÅS 1:12>1	510 050	6 391 950	281,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄSSLEÅS 1:13>1	510 932	6 391 600	300,4	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄSSLEÅS 1:4>1	510 558	6 391 540	285,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
HÄSSLEÅS 1:6>1	511 142	6 391 270	275,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
INGATORPS-BJÖRKEBERG 1:2>1	515 651	6 393 230	254,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
INGATORPS-BJÖRKEBERG 1:3>1	514 672	6 393 380	284,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
INGATORPS-BJÖRKEBERG 1:4>1	514 754	6 393 390	294,1	5,0	5,0	2,0	0,0	0,0	"Green house mode"
INGATORPS-GRIMMESTORP 2:4>1	515 744	6 393 260	294,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
Jonsberg	514 366	6 400 000	254,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
JUSTORP 1:2>2	515 281	6 396 330	308,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
JUSTORP 1:5>1	515 234	6 396 350	306,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
JUSTORP 1:5>1	515 287	6 396 380	307,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:11>1	509 099	6 393 670	270,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:17>1	508 743	6 394 510	293,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:18>1	508 775	6 394 330	282,1	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:19>1	508 979	6 393 660	267,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:20>1	508 779	6 394 410	288,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:22>1	508 768	6 394 440	290,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:23>1	508 891	6 393 230	255,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:24>1	508 751	6 394 490	292,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:25>1	508 984	6 393 700	268,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
KONGSERYD 1:26>1	508 742	6 394 230	280,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LILLA HESTER 2:1>1	513 506	6 397 520	280,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LILLA HESTER 2:2>1	513 693	6 397 530	279,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:20>1	514 704	6 390 990	263,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:21>1	514 863	6 391 040	263,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"

To be continued on next page...

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

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No.	Easting	Northing	Z	Width	Height	Height a.g.l. [m]	Degrees from south cw [°]	Slope of window [°]	Direction mode
			[m]	[m]	[m]				
LÖVSEHULT 1:23>1	515 181	6 390 380	286,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:24>1	514 485	6 389 080	220,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:26>1	513 081	6 391 120	260,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:27>1	514 556	6 391 350	282,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
LÖVSEHULT 1:5>1	515 149	6 390 990	263,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NAREBO 1:3>1	507 151	6 396 150	300,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NAREBO 1:3>1	507 182	6 396 120	300,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 1:10>1	510 758	6 389 790	245,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 1:7>1	510 722	6 389 990	253,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 1:8>1	510 638	6 389 660	235,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 1:9>1	510 653	6 390 190	261,4	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 2:11>1	512 047	6 389 290	216,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 2:12>1	510 873	6 389 710	243,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 2:12>1	510 815	6 389 720	243,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 2:13>1	510 648	6 389 930	250,1	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 4:5>1	512 174	6 389 360	213,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 5:2>1	510 572	6 390 260	263,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 5:3>1	510 518	6 390 400	270,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
NÖDJEHULT 5:3>1	510 506	6 390 400	270,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
PASSAMÅLEN 1:3>1	513 437	6 395 510	312,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
PASSAMÅLEN 1:6>1	511 773	6 395 980	309,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
PASSAMÅLEN 1:7>1	511 717	6 395 980	306,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
PASSAMÅLEN 1:8>1	511 785	6 396 040	311,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SKÄLJARYD 1:5>1	512 328	6 391 800	305,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SPINKARP 1:1>1	512 937	6 396 430	302,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
STENSGÖL 1:11>1	507 202	6 396 930	285,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
Stora Gluggebo	516 790	6 398 888	234,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
STORA HESTER 1:7>1	513 105	6 398 190	275,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:11>1	514 649	6 393 060	272,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:12>1	514 624	6 393 050	272,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:6>1	514 778	6 392 240	282,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:7>1	514 512	6 393 050	276,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:7>1	514 507	6 393 030	276,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
SÄLDEFALL 1:8>1	514 530	6 392 970	273,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VASSEMÅLA 1:1>1	511 636	6 396 420	310,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VASSEMÅLA 1:1>1	511 658	6 396 440	310,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:10>1	514 108	6 394 400	296,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:10>1	514 073	6 394 410	294,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:13>1	514 281	6 394 270	294,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:14>1	514 160	6 394 270	293,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:15>1	514 130	6 394 280	294,9	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:15>1	514 107	6 394 270	293,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:16>1	514 189	6 394 290	295,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:17>1	513 991	6 394 730	293,6	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:18>1	514 126	6 394 330	300,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:19>1	514 121	6 394 350	300,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
VÄSTRA EKÅS 1:7>1	514 137	6 394 300	297,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:11>1	507 762	6 392 850	273,2	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:14>1	507 352	6 392 940	265,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:15>1	508 857	6 392 660	236,5	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:16>1	507 087	6 393 010	265,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:17>1	507 274	6 392 310	245,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:18>1	507 429	6 392 030	228,7	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:2>2	507 459	6 392 870	265,3	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:2>2	507 431	6 392 890	265,0	5,0	5,0	2,0	0,0	0,0	"Green house mode"
ÄGERSGÖL 1:6>1	507 415	6 392 290	243,8	5,0	5,0	2,0	0,0	0,0	"Green house mode"

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

Calculation Results

Shadow receptor

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours	Shadow days	Max shadow	Shadow hours	
	per year [h/year]	per year [days/year]	hours per day [h/day]	per year [h/year]	
ARKARP 1:3>1	0:53	17	0:05	0:12	
ARKARP 1:3>1	0:50	15	0:05	0:11	
ARKARP 1:5>1	13:13	62	0:17	1:23	
ARKARP 1:5>1	13:01	62	0:16	1:22	
BOGÅRD 6:29>1	0:00	0	0:00	0:00	
BOGÅRD 6:30>1	0:00	0	0:00	0:00	
BOGÅRD 6:32>1	0:00	0	0:00	0:00	
BROKABO 1:11>1	2:01	27	0:08	0:25	
BROKABO 1:12>1	0:00	0	0:00	0:00	
BROKABO 1:13>1	6:53	48	0:14	0:45	
BROKABO 1:19>1	4:49	34	0:13	0:27	
BROKABO 1:3>1	0:00	0	0:00	0:00	
BROKABO 1:6>1	0:00	0	0:00	0:00	
BROKABO 1:7>1	0:00	0	0:00	0:00	
BROKABO 1:8>1	0:00	0	0:00	0:00	
DÄNHULT 1:2>1	6:34	38	0:14	0:59	
DÖDRINGSHULT 1:4>1	44:57	130	0:44	5:57	
DÖDRINGSHULT 1:4>1	41:49	127	0:42	5:30	
DÖDRINGSHULT 1:4>1	43:39	130	0:43	5:45	
DÖDRINGSHULT 1:5>1	47:59	137	0:43	6:25	
DÖDRINGSHULT 1:5>1	46:57	136	0:40	6:20	
DÖDRINGSHULT 1:7>1	41:50	132	0:37	5:29	
DÖDRINGSHULT 1:7>1	42:50	134	0:38	5:36	
DÖDRINGSHULT 1:8>1	43:32	122	0:44	5:50	
Grevekulla	108:53	235	1:03	22:53	
Grevekulla 1:11	57:53	177	0:44	7:05	
HUSTOMTA 1:10>2	28:42	146	0:18	3:59	
HUSTOMTA 1:13>1	0:00	0	0:00	0:00	
HUSTOMTA 1:15>1	32:37	148	0:19	4:33	
HUSTOMTA 1:16>1	0:00	0	0:00	0:00	
HUSTOMTA 1:17>1	0:00	0	0:00	0:00	
HUSTOMTA 1:17>1	0:00	0	0:00	0:00	
HUSTOMTA 1:6>1	0:00	0	0:00	0:00	
HUSTOMTA 3:1>1	5:33	36	0:14	0:49	
HUSTOMTA 3:1>1	0:00	0	0:00	0:00	
Hyltestugan	0:00	0	0:00	0:00	
HÄRSTORP 1:13>1	0:00	0	0:00	0:00	
HÄSLEÅS 1:11>1	0:00	0	0:00	0:00	
HÄSLEÅS 1:12>1	23:20	109	0:20	6:54	
HÄSLEÅS 1:13>1	1:49	25	0:06	0:31	
HÄSLEÅS 1:4>1	10:20	46	0:18	2:56	
HÄSLEÅS 1:6>1	0:00	0	0:00	0:00	
INGATORPS-BJÖRKEBERG 1:2>1	6:19	35	0:14	0:56	
INGATORPS-BJÖRKEBERG 1:3>1	28:59	130	0:22	4:53	
INGATORPS-BJÖRKEBERG 1:4>1	24:42	117	0:21	4:02	
INGATORPS-GRIMMESTORP 2:4>1	4:10	29	0:14	0:37	
Jonsberg	18:22	70	0:30	1:43	
JUSTORP 1:2>2	0:00	0	0:00	0:00	
JUSTORP 1:5>1	0:00	0	0:00	0:00	
JUSTORP 1:5>1	0:00	0	0:00	0:00	
KONGSERYD 1:11>1	65:44	214	0:38	14:50	
KONGSERYD 1:17>1	54:49	199	0:32	11:38	
KONGSERYD 1:18>1	47:51	164	0:42	9:30	
KONGSERYD 1:19>1	56:26	212	0:30	12:54	
KONGSERYD 1:20>1	44:26	162	0:42	8:29	
KONGSERYD 1:22>1	42:10	159	0:40	7:52	
KONGSERYD 1:23>1	37:47	132	0:41	9:18	
KONGSERYD 1:24>1	52:16	196	0:35	10:41	
KONGSERYD 1:25>1	55:00	214	0:29	12:17	
KONGSERYD 1:26>1	47:13	160	0:42	9:43	
LILLA HESTER 2:1>1	8:32	77	0:13	2:18	
LILLA HESTER 2:2>1	17:34	118	0:17	4:50	

To be continued on next page...

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

...continued from previous page

No.	Shadow, worst case			Shadow, expected values	
	Shadow hours per year [h/year]	Shadow days per year [days/year]	Max shadow hours per day [h/day]	Shadow hours per year [h/year]	
LÖVSEHULT 1:20>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:21>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:23>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:24>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:26>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:27>1	0:00	0	0:00	0:00	
LÖVSEHULT 1:5>1	4:06	25	0:12	0:58	
NAREBO 1:3>1	4:11	21	0:17	0:35	
NAREBO 1:3>1	4:25	21	0:17	0:37	
NÖDJEHULT 1:10>1	0:00	0	0:00	0:00	
NÖDJEHULT 1:7>1	0:00	0	0:00	0:00	
NÖDJEHULT 1:8>1	0:00	0	0:00	0:00	
NÖDJEHULT 1:9>1	0:00	0	0:00	0:00	
NÖDJEHULT 2:11>1	0:00	0	0:00	0:00	
NÖDJEHULT 2:12>1	0:00	0	0:00	0:00	
NÖDJEHULT 2:12>1	0:00	0	0:00	0:00	
NÖDJEHULT 2:13>1	0:00	0	0:00	0:00	
NÖDJEHULT 4:5>1	0:00	0	0:00	0:00	
NÖDJEHULT 5:2>1	0:00	0	0:00	0:00	
NÖDJEHULT 5:3>1	0:00	0	0:00	0:00	
NÖDJEHULT 5:3>1	0:00	0	0:00	0:00	
PASSAMÅLEN 1:3>1	45:07	128	0:46	6:02	
PASSAMÅLEN 1:6>1	129:22	134	1:57	13:28	
PASSAMÅLEN 1:7>1	131:19	133	1:50	13:49	
PASSAMÅLEN 1:8>1	115:08	131	1:52	11:49	
SKÅLJARYD 1:5>1	31:44	109	0:25	8:56	
SPINKARP 1:1>1	30:59	98	0:35	3:21	
STENSGÖL 1:11>1	3:52	22	0:15	0:24	
Stora Gluggebo	37:02	133	0:37	5:10	
STORA HESTER 1:7>1	3:20	41	0:09	0:41	
SÄLDEFALL 1:11>1	27:42	105	0:25	4:48	
SÄLDEFALL 1:12>1	37:00	153	0:25	7:01	
SÄLDEFALL 1:6>1	26:33	74	0:34	6:22	
SÄLDEFALL 1:7>1	40:49	160	0:27	7:20	
SÄLDEFALL 1:7>1	39:56	155	0:27	7:08	
SÄLDEFALL 1:8>1	37:35	142	0:27	6:45	
VASSEMÅLA 1:1>1	50:09	99	0:52	5:11	
VASSEMÅLA 1:1>1	45:20	98	0:49	4:43	
VÄSTRA EKÅS 1:10>1	31:04	134	0:30	6:06	
VÄSTRA EKÅS 1:10>1	33:14	140	0:32	6:33	
VÄSTRA EKÅS 1:13>1	32:05	160	0:19	5:28	
VÄSTRA EKÅS 1:14>1	35:28	158	0:32	6:35	
VÄSTRA EKÅS 1:15>1	34:39	155	0:33	6:36	
VÄSTRA EKÅS 1:15>1	36:11	159	0:32	6:55	
VÄSTRA EKÅS 1:16>1	31:11	156	0:21	5:39	
VÄSTRA EKÅS 1:17>1	32:25	141	0:24	5:37	
VÄSTRA EKÅS 1:18>1	30:11	140	0:31	5:59	
VÄSTRA EKÅS 1:19>1	30:08	134	0:31	5:59	
VÄSTRA EKÅS 1:7>1	32:51	152	0:32	6:19	
ÅGERSGÖL 1:11>1	2:10	17	0:12	0:33	
ÅGERSGÖL 1:14>1	0:00	0	0:00	0:00	
ÅGERSGÖL 1:15>1	33:57	104	0:35	9:27	
ÅGERSGÖL 1:16>1	0:00	0	0:00	0:00	
ÅGERSGÖL 1:17>1	0:00	0	0:00	0:00	
ÅGERSGÖL 1:18>1	0:00	0	0:00	0:00	
ÅGERSGÖL 1:2>2	0:00	0	0:00	0:00	
ÅGERSGÖL 1:2>2	0:00	0	0:00	0:00	
ÅGERSGÖL 1:6>1	0:00	0	0:00	0:00	

SHADOW - Main Result

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (283)	41:55	7:07
2	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (284)	50:27	9:37
3	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (285)	63:39	14:31
4	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (286)	36:29	6:01
5	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (287)	23:39	3:01
6	VESTAS V117-3.3 GridStreame 3300 117.0 !O! hub: 91,5 m (TOT: 150,0 m) (288)	34:00	3:44
B0001	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (914)	10:47	1:17
B0002	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (915)	23:26	6:08
B0003	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (916)	52:30	11:45
B0004	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (917)	67:25	13:50
B0005	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (918)	43:20	6:49
B0006	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (919)	56:37	9:15
B0007	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (920)	67:57	13:45
B0008	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (921)	49:39	10:26
B0009	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (922)	30:48	7:05
B0010	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (923)	19:00	3:27
B0011	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (924)	10:58	3:23
B0012	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (925)	85:29	10:42
B0013	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (926)	13:18	2:49
B0014	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (927)	4:42	0:50
B0015	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (928)	9:05	2:34
B0016	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (929)	16:34	4:22
B0017	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (930)	112:26	15:05
B0018	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (931)	124:52	19:26
B0019	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (932)	26:04	3:38
B0020	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (933)	46:21	6:56
B0021	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (934)	41:37	7:04
B0022	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (935)	49:30	7:53
B0023	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (936)	94:17	16:46
B0024	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (937)	95:39	15:20
B0025	NORDEX N131/3000 3000 131.0 !O! hub: 144,5 m (TOT: 210,0 m) (938)	27:32	4:08

Total times in Receptor wise and WTG wise tables can differ, as a WTG can lead to flicker at 2 or more receptors simultaneously and/or receptors may receive flicker from 2 or more WTGs simultaneously.

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (855)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	05:40 (1) 21:46	04:10 22:03	04:03 21:18	04:52 20:00	05:58 18:36	07:02 16:15	08:16 15:20
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:47	05:40 (1) 21:47	04:09 22:02	04:04 21:16	04:54 19:58	06:00 18:34	07:04 16:13	08:18 15:19
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	05:40 (1) 21:49	04:08 22:02	04:05 21:14	04:56 19:55	06:02 18:31	07:06 16:10	08:19 15:18
4	08:42 15:27	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	04:59 19:52	06:04 18:28	07:08 16:08	08:21 15:18
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	05:01 19:49	06:07 18:25	07:10 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:53	04:08 21:59	05:03 21:07	05:03 19:47	06:09 18:23	07:12 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:57 20:58	04:04 21:54	04:09 21:59	05:05 21:05	05:05 19:44	06:11 18:20	07:15 16:01	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:02	05:07 19:41	06:13 18:17	07:17 15:59	08:28 15:15
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56	04:12 21:57	05:09 21:00	05:09 19:38	06:15 18:14	07:19 15:57	08:29 15:14
10	08:38 15:36	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:56	05:11 20:58	05:11 19:35	06:17 18:12	07:21 15:55	08:30 15:14
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	05:13 19:33	06:19 18:09	07:23 15:53	08:32 15:13
12	08:36 15:40	07:40 16:49	06:27 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:53	05:15 19:30	05:49 (1) 19:30	06:21 18:06	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	04:00 22:00	04:18 21:52	05:18 20:50	05:18 19:27	06:23 18:03	07:28 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:01	04:19 21:51	05:20 20:48	05:20 19:24	4 06:55 (1) 19:24	4 06:59 (5) 18:01	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	05:22 19:21	2 06:59 (5) 19:21	2 06:59 (5) 17:58	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:17	03:59 22:02	04:22 21:48	05:24 20:43	05:24 19:19	06:30 17:55	07:34 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:19	03:58 22:03	04:24 21:46	05:26 20:40	05:26 19:16	06:32 17:53	07:37 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:16	04:33 21:21	03:58 22:03	04:26 21:45	05:28 20:38	05:28 19:13	06:34 17:50	07:39 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:23	03:58 22:04	04:27 21:43	05:30 20:35	05:30 19:10	06:36 17:48	07:41 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	05:32 19:07	06:38 17:45	07:43 15:36	08:41 15:13
21	08:24 15:58	07:17 17:11	06:02 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:40	05:35 20:30	05:35 19:04	06:40 17:42	07:45 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:25	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	05:37 19:02	06:42 17:40	07:48 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	05:39 18:59	06:45 17:37	07:50 15:31	08:42 15:14
24	08:19 16:05	07:10 17:18	05:53 18:21	05:28 20:29	04:22 21:32	03:59 22:05	04:37 21:34	05:41 20:22	05:41 18:56	06:47 17:35	07:52 15:30	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:05	04:38 21:32	05:43 20:19	05:43 18:53	06:49 17:32	06:55 15:28	08:43 15:16
26	08:16 16:09	07:04 17:22	05:48 18:25	05:23 20:33	04:19 21:36	04:00 22:05	04:40 21:31	05:45 20:17	05:45 18:50	06:51 17:30	06:57 15:27	08:43 15:16
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:36	04:17 21:37	04:00 22:04	04:42 21:29	05:47 20:14	05:47 18:48	06:53 17:27	06:59 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:27	05:50 20:11	05:50 18:45	06:55 17:24	07:01 15:24	08:44 15:18
29	08:10 16:16	06:59 19:32	2 07:05 (5) 18:30	05:16 20:40	04:14 21:41	04:02 22:04	04:46 21:25	05:52 20:08	05:52 18:42	06:57 17:22	07:04 15:23	08:44 15:19
30	08:08 16:19	06:56 19:34	07:02 (5) 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	05:54 18:39	06:59 17:20	07:06 15:22	08:44 15:20
31	08:06 16:21	06:54 19:36	07:06 (5) 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	05:56 18:37	06:59 17:17	07:08 16:17	08:44 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
Total, worst case												
Sun reduction			9		8		7	16	10			
Oper. time red.			0,22	0,42	0,53			0,35	0,31			
Wind dir. red.			0,99	0,99	0,99			0,99	0,99			
Total reduction			0,65	0,68	0,68			0,68	0,65			
Total, real			0,14	0,28	0,36			0,24	0,20			
			1	2	2			4	2			

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:3>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (916)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	05:40 (1) 21:46	04:10 22:03	04:03 21:18	04:52 20:00	05:58 18:36	07:02 16:15	08:16 15:20
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:47	05:40 (1) 21:47	04:04 22:02	04:54 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:19
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	05:43 (1) 21:49	04:08 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	06:04 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:53	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:57 20:58	04:04 21:54	04:09 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:01	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	08:36 15:40	07:40 16:49	06:27 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:01	04:19 21:51	06:26 20:48	2 06:55 (1) 19:24	06:55 (5) 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	06:57 (5) 17:58	07:43 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:17	03:59 22:02	04:22 21:48	05:24 20:43	06:30 19:19	06:59 (5) 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:19	03:58 22:03	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:16	04:33 21:21	03:58 22:03	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:23	03:58 22:04	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	08:24 15:58	07:17 17:11	06:02 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:25	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:10 17:18	05:53 18:21	05:28 20:29	04:22 21:32	03:59 22:05	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:05	04:38 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	08:16 16:09	07:04 17:22	05:48 18:25	05:23 20:33	04:19 21:36	04:00 22:05	04:40 21:31	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:36	04:17 21:37	04:00 22:04	04:42 21:29	05:47 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:39 19:32	2 07:05 (5) 18:16	05:16 20:40	04:14 21:41	04:02 22:04	04:46 21:25	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	08:08 16:19	06:36 19:34	07:02 (5) 18:19	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:44 15:20
31	08:06 16:21	06:34 19:36	07:06 (5) 18:21	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	18:39	07:08 16:17	08:14 15:21	08:44 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
Total, worst case												
Sun reduction			10		8			17		10		
Oper. time red.			0,22	0,42	0,53			0,35		0,31		
Wind dir. red.			0,99	0,99	0,99			0,99		0,99		
Total reduction			0,65	0,68	0,68			0,68		0,65		
Total, real			0,14	0,28	0,36			0,24		0,20		

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (816)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23 16	14:05 (B0012) 14:21 (B0012) 16:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44
2	08:43 15:24 16	14:05 (B0012) 14:21 (B0012) 16:26	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:47
3	08:43 15:25 16	14:06 (B0012) 14:22 (B0012) 16:28	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49
4	08:42 15:27 15	14:07 (B0012) 14:22 (B0012) 16:30	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51
5	08:42 15:28 15	14:07 (B0012) 14:22 (B0012) 16:33	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53
6	08:41 15:30 14	14:08 (B0012) 14:22 (B0012) 16:35	07:53 16:35 2	15:58 (B0006) 16:00 (B0006) 17:40	06:43 19:49	04:59 20:55
7	08:40 15:31 14	14:09 (B0012) 14:23 (B0012) 16:37	07:51 16:37 5	15:58 (B0006) 16:03 (B0006) 17:43	06:40 19:51	04:57 20:57
8	08:40 15:33 14	14:09 (B0012) 14:23 (B0012) 16:40	07:49 16:40 8	15:57 (B0006) 16:05 (B0006) 17:45	06:38 19:54	04:54 21:00
9	08:39 15:35 13	14:10 (B0012) 14:23 (B0012) 16:42	07:47 16:42 11	15:57 (B0006) 16:08 (B0006) 17:47	06:35 19:56	04:52 21:02
10	08:38 15:36 11	14:12 (B0012) 14:23 (B0012) 16:45	07:44 16:45 13	15:57 (B0006) 16:10 (B0006) 17:50	06:32 19:58	04:50 21:04
11	08:37 15:38 10	14:12 (B0012) 14:22 (B0012) 16:47	07:42 16:47 12	15:58 (B0006) 16:10 (B0006) 17:52	06:29 20:00	04:48 21:06
12	08:36 15:40 8	14:14 (B0012) 14:22 (B0012) 16:49	07:40 16:49 10	15:59 (B0006) 16:09 (B0006) 17:54	06:27 20:02	04:45 21:08
13	08:35 15:42 3	14:16 (B0012) 14:19 (B0012) 16:52	07:37 16:52 7	16:01 (B0006) 16:08 (B0006) 17:56	05:58 20:05	04:43 21:10
14	08:34 15:44	07:35 16:54	07:35 16:54	17:56 20:07	20:05 21:12	21:10 22:01
15	08:32 15:46	07:32 16:56	07:32 16:56	17:58 18:01	20:07 20:09	21:12 21:14
16	08:31 15:48	07:30 16:59	07:30 16:59	18:03 20:11	20:09 21:16	21:14 22:02
17	08:30 15:50	07:27 17:01	07:27 17:01	18:05 20:13	20:11 21:19	21:16 22:03
18	08:28 15:52	07:25 17:03	07:25 17:03	18:07 20:16	20:13 21:21	21:19 22:03
19	08:27 15:54	07:22 17:06	07:22 17:06	18:07 20:18	20:16 21:22	21:21 22:04
20	08:26 15:56	07:20 17:08	07:20 17:08	18:10 20:18	20:18 21:22	21:22 22:04
21	08:24 15:58	07:17 17:11	07:17 17:11	18:12 20:20	20:18 21:24	21:22 22:04
22	08:22 16:00	07:15 17:13	07:15 17:13	18:14 20:22	20:20 21:26	21:24 22:04
23	08:21 16:03	07:12 17:15	07:12 17:15	18:16 20:27	20:22 21:30	21:26 22:05
24	08:19 16:05	07:10 17:18	07:10 17:18	18:18 20:29	20:27 21:32	21:30 22:05
25	08:17 16:07	07:07 17:20	07:07 17:20	18:21 20:31	20:29 21:34	21:32 22:05
26	08:16 16:09	07:04 17:22	07:04 17:22	18:23 20:33	20:31 21:36	21:34 22:04
27	08:14 16:12	07:02 17:24	07:02 17:24	18:25 20:36	20:33 21:37	21:36 22:04
28	08:12 16:14	06:59 17:27	06:59 17:27	18:27 20:38	20:36 21:39	21:37 22:04
29	08:10 16:16			18:29 20:39	20:38 21:41	21:39 22:04
30	08:08 16:19			19:32 20:40	20:40 21:41	21:41 22:04
31	08:06 16:21			06:36 19:34	05:13 20:42	04:13 21:42
Potential sun hours	228	262	366	429	515	539
Total, worst case	165	68				
Sun reduction	0,19	0,16				
Oper. time red.	0,99	0,99				
Wind dir. red.	0,70	0,69				
Total reduction	0,13	0,11				
Total, real	21	8				

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:5>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (816)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December		
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	15:27 (B0006) 15:39 (B0006)	08:16 15:21	13:54 (B0012) 14:04 (B0012)
2	04:04 22:02	04:54 21:16	06:00 19:58	07:04 18:34	07:13 16:13	15:27 (B0006) 15:37 (B0006)	08:18 15:19	13:54 (B0012) 14:05 (B0012)
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	15:26 (B0006) 15:34 (B0006)	08:19 15:19	13:54 (B0012) 14:06 (B0012)
4	04:06 22:01	04:59 21:12	06:04 19:52	07:08 18:28	07:18 16:08	15:27 (B0006) 15:32 (B0006)	08:21 15:18	13:54 (B0012) 14:07 (B0012)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	15:28 (B0006) 15:30 (B0006)	08:23 15:17	13:54 (B0012) 14:08 (B0012)
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04		08:24 15:16	13:54 (B0012) 14:08 (B0012)
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:01		08:26 15:15	13:54 (B0012) 14:09 (B0012)
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59		08:28 15:15	13:55 (B0012) 14:10 (B0012)
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57		08:29 15:14	13:55 (B0012) 14:10 (B0012)
10	04:13 21:55	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55		08:30 15:14	13:55 (B0012) 14:11 (B0012)
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53		08:32 15:13	13:55 (B0012) 14:11 (B0012)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51		08:33 15:13	13:56 (B0012) 14:12 (B0012)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:04	07:38 15:49		08:34 15:13	13:56 (B0012) 14:12 (B0012)
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47		08:35 15:12	13:56 (B0012) 14:12 (B0012)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45		08:36 15:12	13:57 (B0012) 14:13 (B0012)
16	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:55	07:45 15:43		08:37 15:12	13:57 (B0012) 14:13 (B0012)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41		08:38 15:12	13:58 (B0012) 14:14 (B0012)
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39		08:39 15:12	13:58 (B0012) 14:14 (B0012)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38		08:40 15:13	13:59 (B0012) 14:15 (B0012)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36		08:41 15:13	14:00 (B0012) 14:16 (B0012)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34		08:41 15:13	14:00 (B0012) 14:16 (B0012)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33		08:42 15:14	14:01 (B0012) 14:17 (B0012)
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31		08:42 15:14	14:01 (B0012) 14:17 (B0012)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30		08:43 15:15	14:01 (B0012) 14:17 (B0012)
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28		08:43 15:16	14:02 (B0012) 14:18 (B0012)
26	04:40 21:30	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27		08:43 15:16	14:03 (B0012) 14:18 (B0012)
27	04:42 21:29	05:47 20:14	06:53 18:48	06:59 16:27	08:08 15:25		08:44 15:17	14:03 (B0012) 14:19 (B0012)
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24		08:44 15:18	14:04 (B0012) 14:20 (B0012)
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	13:58 (B0012) 14:00 (B0012)	08:44 15:19	14:03 (B0012) 14:19 (B0012)
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	2 13:55 (B0012) 14:03 (B0012)	08:44 15:20	14:04 (B0012) 14:20 (B0012)
31	04:50 21:20	05:56 20:03		07:08 16:17	11 15:39 (B0006) 15:40 (B0006)	8	08:44 15:21	14:05 (B0012) 14:21 (B0012)
Potential sun hours	538	474	386	321	241		207	
Total, worst case				31	47		470	
Sun reduction				0,26	0,17		0,13	
Oper. time red.				0,99	0,99		0,99	
Wind dir. red.				0,69	0,69		0,70	
Total reduction				0,18	0,12		0,09	
Total, real				5	6		43	

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (915)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23 16	14:05 (B0012) 14:21 (B0012) 16:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44
2	08:43 15:24 16	14:05 (B0012) 14:21 (B0012) 16:26	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:47
3	08:43 15:25 15	14:07 (B0012) 14:22 (B0012) 16:28	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49
4	08:42 15:27 16	14:07 (B0012) 14:23 (B0012) 16:30	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51
5	08:42 15:28 16	14:07 (B0012) 14:23 (B0012) 16:33	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53
6	08:41 15:30 15	14:08 (B0012) 14:23 (B0012) 16:35	07:53 16:35 1	15:59 (B0006) 16:00 (B0006) 17:40	06:43 19:49	04:59 20:55
7	08:40 15:31 14	14:09 (B0012) 14:23 (B0012) 16:37	07:51 16:37 4	15:59 (B0006) 16:03 (B0006) 17:43	06:40 19:51	04:57 20:57
8	08:40 15:33 13	14:10 (B0012) 14:23 (B0012) 16:40	07:49 16:40 7	15:58 (B0006) 16:05 (B0006) 17:45	06:38 19:54	04:54 21:00
9	08:39 15:35 12	14:11 (B0012) 14:23 (B0012) 16:42	07:47 16:42 10	15:58 (B0006) 16:08 (B0006) 17:47	06:35 19:56	04:52 21:02
10	08:38 15:40 12	14:12 (B0012) 14:24 (B0012) 16:45	07:44 16:45 12	15:58 (B0006) 16:10 (B0006) 17:50	06:32 19:58	04:50 21:04
11	08:37 15:38 11	14:12 (B0012) 14:23 (B0012) 16:47	07:42 16:47 13	15:59 (B0006) 16:12 (B0006) 17:52	06:29 20:00	04:48 21:06
12	08:36 15:40 8	14:14 (B0012) 14:22 (B0012) 16:49	07:40 16:49 11	15:59 (B0006) 16:10 (B0006) 17:54	06:27 20:02	04:45 21:08
13	08:35 15:42 5	14:16 (B0012) 14:21 (B0012) 16:52	07:37 16:52 8	16:02 (B0006) 16:10 (B0006) 17:56	05:58 20:05	04:43 21:10
14	08:34 15:44	16:54	07:35	17:56	20:05	21:10
15	08:32 15:46	16:54	07:35	17:56	20:05	21:10
16	08:31 15:48	16:54	07:35	17:56	20:05	21:10
17	08:30 15:50	16:54	07:35	17:56	20:05	21:10
18	08:28 15:52	16:54	07:35	17:56	20:05	21:10
19	08:27 15:54	16:54	07:35	17:56	20:05	21:10
20	08:26 15:56	16:54	07:35	17:56	20:05	21:10
21	08:24 15:58	16:54	07:35	17:56	20:05	21:10
22	08:22 16:00	16:54	07:35	17:56	20:05	21:10
23	08:21 16:03	16:54	07:35	17:56	20:05	21:10
24	08:19 16:05	16:54	07:35	17:56	20:05	21:10
25	08:17 16:07	16:54	07:35	17:56	20:05	21:10
26	08:16 16:09	16:54	07:35	17:56	20:05	21:10
27	08:14 16:12	16:54	07:35	17:56	20:05	21:10
28	08:12 16:14	16:54	07:35	17:56	20:05	21:10
29	08:10 16:16	16:54	07:35	17:56	20:05	21:10
30	08:08 16:19	16:54	07:35	17:56	20:05	21:10
31	08:06 16:21	16:54	07:35	17:56	20:05	21:10
Potential sun hours	228	262	366	429	515	539
Total, worst case	169	66				
Sun reduction	0,19	0,16				
Oper. time red.	0,99	0,99				
Wind dir. red.	0,70	0,69				
Total reduction	0,13	0,11				
Total, real	22	7				

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ARKARP 1:5>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (915)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:21
2	04:04 22:02	04:54 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:19
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19
4	04:06 22:01	04:59 21:12	06:04 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:16
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:01	08:26 15:15
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	04:13 21:55	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:36 15:12
16	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:55	07:45 15:43	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:38 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	04:40 21:30	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	04:42 21:29	05:47 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:44 15:20
31	04:50 21:20	05:56 20:03		07:08 16:18	08:16 15:21	08:44 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case				36	43	479
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,69	0,70
Total reduction				0,18	0,12	0,09
Total, real				6	5	43

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BOGÅRD 6:29>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (812)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:06 20:49	04:08 21:48	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	08:21 15:18
5	08:41 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:36	06:43 17:45	06:17 19:54	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:52	04:57 20:57	04:04 21:54	04:10 21:58	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:58	06:17 19:36	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:23 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:40 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:22	07:32 17:58	07:43 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:38 21:16	03:59 22:02	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:44	08:37 15:13
17	08:30 15:50	07:28 17:02	06:13 18:05	05:47 20:14	04:36 21:18	03:59 22:02	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:28 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:20	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:22	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	08:25 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:24	03:59 22:04	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:14
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:28	03:59 22:04	04:34 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:23 21:32	04:00 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:04	04:39 21:32	05:44 20:19	06:49 18:53	06:55 16:33	08:04 15:29	08:43 15:16
26	08:15 16:10	07:05 17:23	05:48 18:25	05:24 20:33	04:19 21:36	04:01 22:04	04:41 21:30	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:43 15:18
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17	06:59 19:32	05:42 20:40	05:16 21:41	04:15 22:04	04:02 21:24	04:47 20:09	05:52 18:42	06:58 16:23	07:04 15:23	08:12 15:20	08:44 15:20
30	08:08 16:19	06:57 19:34	05:41 20:42	05:14 21:42	04:13 22:03	04:03 21:22	04:49 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21	06:54 19:36	05:40 20:42	05:12 21:44	04:11 22:04	04:01 21:20	04:51 20:03	05:56 16:18	07:08 15:22	07:08 15:22	08:14 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BOGÅRD 6:30>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (810)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:24	08:04 16:24	06:57 17:30	06:31 19:38	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:29	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:48	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:28	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:31	07:53 16:36	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53	04:09 21:59	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:58	05:08 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:58	06:18 19:36	07:21 18:12	07:31 15:56	08:30 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:14
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:45	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:47	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:22 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:46	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:38 21:17	03:59 22:02	04:23 21:48	05:25 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:37 15:13
17	08:30 15:51	07:28 17:02	06:13 18:06	05:47 20:14	04:36 21:19	03:59 22:03	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:29 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:21	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:23	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:25	03:59 22:04	04:30 21:41	05:33 20:33	06:39 19:08	07:43 17:45	07:54 15:37	08:41 15:14
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:17	05:34 20:25	04:26 21:28	03:59 22:04	04:34 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:06	07:10 17:18	05:54 18:21	05:29 20:29	04:23 21:32	04:00 22:05	04:37 21:34	05:42 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:32	05:44 20:19	06:49 18:54	06:55 16:33	08:04 15:29	08:43 15:16
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:34	04:19 21:36	04:01 22:04	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:28	05:21 20:36	04:18 21:37	04:01 22:04	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:44 15:18
28	08:12 16:15	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17	06:40 19:32	05:16 20:40	04:15 21:41	04:02 22:04	04:02 21:25	04:47 20:09	05:52 18:42	06:58 16:23	07:04 15:23	08:12 15:20	08:44 15:20
30	08:08 16:19	06:37 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:03 21:22	04:49 20:06	05:54 18:40	07:00 16:20	07:06 15:22	08:14 15:21	08:44 15:21
31	08:06 16:21	06:34 19:36	05:12 20:44	04:11 21:44	04:01 22:04	04:01 21:20	04:51 20:03	05:56 18:40	07:08 16:18	07:08 15:22	08:16 15:22	08:44 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BOGÅRD 6:32>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (838)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:24	08:04 16:24	06:57 17:30	06:31 19:38	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:29	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:28	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:11 18:26	07:20 16:06	08:23 15:17
6	08:41 15:31	07:53 16:36	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53	04:09 21:59	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:58	05:08 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:58	06:18 19:36	07:21 18:12	07:31 15:56	08:30 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:14
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:45	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:47	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:22 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:46	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:38 21:17	03:59 22:02	04:23 21:48	05:25 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:37 15:13
17	08:30 15:51	07:28 17:02	06:13 18:06	05:47 20:14	04:36 21:19	03:59 22:03	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:29 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:21	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:23	03:59 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:25	03:59 22:04	04:30 21:41	05:33 20:33	06:39 19:08	07:43 17:45	07:54 15:37	08:41 15:14
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:26	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:17	05:34 20:25	04:26 21:28	03:59 22:04	04:34 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:06	07:10 17:18	05:54 18:21	05:29 20:29	04:23 21:32	04:00 22:05	04:37 21:34	05:42 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:32	05:44 20:19	06:49 18:54	06:55 16:33	08:04 15:29	08:43 15:16
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:34	04:19 21:36	04:01 22:04	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:28	05:21 20:36	04:18 21:37	04:01 22:04	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:44 15:18
28	08:12 16:15	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:27	05:50 20:11	06:56 18:45	07:02 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17	06:40 19:32	05:16 20:40	04:15 21:41	04:02 22:04	04:02 21:25	04:47 20:09	05:52 18:42	06:58 16:23	07:04 15:23	08:12 15:20	08:44 15:20
30	08:08 16:19	06:37 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:03 21:23	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21	06:34 19:36	05:12 20:44	04:11 21:44	04:01 22:04	04:01 21:20	04:51 20:03	05:56 16:18	07:08 15:22	07:08 15:22	08:14 15:22	08:44 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (902)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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	08:04	06:56	06:31	06:57 (1)	05:11	04:10	04:03	04:52	05:58	07:02	07:11	08:16	
	15:23	16:23	17:29	19:38	6 07:03 (1)	20:44	21:46	22:03	21:18	20:00	18:36	16:15	15:20	
2	08:43	08:02	06:54	06:28	06:54 (1)	05:08	04:09	04:04	04:54	06:00	07:04	07:13	08:18	
	15:24	16:26	17:31	19:40	7 07:01 (1)	20:47	21:47	22:02	21:16	19:58	18:34	16:13	15:19	
3	08:43	08:00	06:51	06:25	06:51 (1)	05:06	04:08	04:05	04:56	06:02	07:06	07:15	08:20	
	15:25	16:28	17:34	19:43	8 06:59 (1)	20:49	21:49	22:02	21:14	19:55	18:31	16:10	15:18	
4	08:42	07:58	06:48	06:22		05:04	04:07	04:06	04:59	06:04	07:08	07:18	08:21	
	15:27	16:30	17:36	19:45		20:51	21:50	22:01	21:12	19:52	18:28	16:08	15:17	
5	08:42	07:56	06:46	06:20		05:01	04:05	04:07	05:01	06:07	07:10	07:20	08:23	
	15:28	16:33	17:38	19:47		20:53	21:51	22:00	21:09	19:49	18:25	16:06	15:17	
6	08:41	07:53	06:43	06:17		04:59	04:04	04:08	05:03	06:09	07:12	07:22	08:25	
	15:30	16:35	17:40	19:49		20:55	21:53	22:00	21:07	19:47	18:23	16:04	15:16	
7	08:40	07:51	06:40	06:14		04:56	04:04	04:09	05:05	06:11	07:15	07:24	08:26	
	15:31	16:37	17:43	19:51		20:58	21:54	21:59	21:05	19:44	18:20	16:01	15:15	
8	08:40	07:49	06:38	06:11		04:54	04:03	04:11	05:07	06:13	07:17	07:27	08:28	
	15:33	16:40	17:45	19:54		21:00	21:55	21:58	21:02	19:41	18:17	15:59	15:15	
9	08:39	07:47	06:35	06:09		04:52	04:02	04:12	05:09	06:15	07:19	07:29	08:29	
	15:35	16:42	17:47	19:56		21:02	21:56	21:57	21:00	19:38	7 06:46 (1)	18:14	15:57	15:14
10	08:38	07:44	06:32	06:06		04:50	04:01	04:13	05:11	06:17	06:47 (1)	07:21	07:31	08:30
	15:36	16:45	17:50	19:58		21:04	21:57	21:56	20:58	19:35	7 06:54 (1)	18:12	15:55	15:13
11	08:37	07:42	06:29	06:03		04:47	04:01	04:15	05:13	06:19	06:49 (1)	07:23	07:34	08:32
	15:38	16:47	17:52	20:00		21:06	21:58	21:54	20:55	19:33	6 06:55 (1)	18:09	15:53	15:13
12	08:36	07:40	06:27	06:00		04:45	04:00	04:16	05:15	06:21	06:51 (1)	07:25	07:36	08:33
	15:40	16:49	17:54	20:02		21:08	21:59	21:53	20:53	19:30	4 06:55 (1)	18:06	15:51	15:13
13	08:35	07:37	06:24	05:58		04:43	04:00	04:18	05:18	06:23	06:53 (1)	07:28	07:38	08:34
	15:42	16:52	17:56	20:05	2 06:26 (2)	21:10	22:00	21:52	20:50	19:27	2 06:55 (1)	18:03	15:49	15:12
14	08:34	07:35	06:21	05:55		04:41	03:59	04:19	05:20	06:26	07:30	07:40	08:35	
	15:44	16:54	17:58	20:07	4 06:26 (2)	21:12	22:01	21:51	20:48	19:24	18:01	15:47	15:12	
15	08:33	07:32	06:18	05:52		04:39	03:59	04:21	05:22	06:28	07:32	07:43	08:37	
	15:46	16:56	18:01	20:09	5 06:24 (2)	21:15	22:01	21:49	20:45	19:21	17:58	15:45	15:12	
16	08:31	07:30	06:15	05:50		04:37	03:58	04:22	05:24	06:30	07:34	07:45	08:38	
	15:48	16:59	18:03	20:11	1 06:20 (2)	21:17	22:02	21:48	20:43	19:19	17:55	15:43	15:12	
17	08:30	07:27	06:13	05:47		04:35	03:58	04:24	05:26	06:32	7 07:03 (4)	07:37	07:47	08:38
	15:50	17:01	18:05	20:13		21:19	22:03	21:46	20:40	19:16	6 07:09 (4)	17:53	15:41	15:12
18	08:29	07:25	06:10	05:44		04:33	03:58	04:26	05:28	06:34	07:03 (4)	07:39	07:49	08:39
	15:52	17:03	18:07	20:16		21:21	22:03	21:45	20:38	19:13	7 07:10 (4)	17:50	15:39	15:12
19	08:27	07:22	06:07	05:42		04:31	03:58	04:27	05:30	06:36	07:06 (4)	07:41	07:52	08:40
	15:54	17:06	18:10	20:18		21:23	22:04	21:43	20:35	19:10	5 07:11 (4)	17:48	15:38	15:13
20	08:26	07:20	06:04	05:39		04:29	03:58	04:29	05:32	06:38	07:08 (4)	07:43	07:54	08:41
	15:56	17:08	18:12	20:20		21:25	22:04	21:41	20:32	19:07	3 07:11 (4)	17:45	15:36	15:13
21	08:24	07:17	06:02	05:36		04:27	03:58	04:31	05:35	06:40	07:10 (4)	07:46	07:56	08:41
	15:58	17:10	18:14	20:22		21:26	22:04	21:40	20:30	19:04	1 07:11 (4)	17:42	15:34	15:13
22	08:22	07:15	05:59	05:34		04:25	03:58	04:33	05:37	06:42	07:48	07:58	08:42	
	16:00	17:13	18:16	20:25		21:28	22:04	21:38	20:27	19:02	07:40	15:33	15:14	
23	08:21	07:12	05:56	05:31		04:24	03:59	04:35	05:39	06:45	07:50	08:00	08:43	
	16:03	17:15	18:18	3 06:25 (4)	20:27	21:30	22:05	21:36	20:25	18:59	17:37	15:31	15:14	
24	08:19	07:10	05:53	05:28		04:22	03:59	04:37	05:41	06:47	07:52	08:02	08:43	
	16:05	17:17	18:21	5 06:24 (4)	20:29	21:32	22:05	21:34	20:22	18:56	17:35	15:29	15:15	
25	08:17	07:07	05:50	05:26		04:20	03:59	04:38	05:43	06:49	06:55	08:04	08:43	
	16:07	17:20	18:23	7 06:23 (4)	20:31	21:34	22:05	21:32	20:19	18:53	16:32	15:28	15:15	
26	08:16	07:04	05:48	05:23		04:19	04:00	04:40	05:45	06:51	06:57	08:06	08:44	
	16:09	17:22	18:25	7 06:22 (4)	20:33	21:36	22:05	21:31	20:17	18:50	16:30	15:27	15:16	
27	08:14	07:02	05:45	05:21		04:17	04:00	04:42	05:47	06:53	06:59	08:08	08:44	
	16:12	17:24	18:27	20:36		21:37	22:04	21:29	20:14	2 06:23 (2)	18:48	16:27	15:25	15:17
28	08:12	06:59	05:42	05:18		04:16	04:01	04:44	05:50	06:55	07:01	08:10	08:44	
	16:14	17:27	18:29	20:38		21:39	22:04	21:27	20:11	5 06:26 (2)	18:45	16:25	15:24	15:18
29	08:10		06:39	05:16		04:14	04:02	04:46	05:52	06:57	06:23 (2)	07:04	08:12	08:44
	16:16		19:32	20:40		21:41	22:04	21:25	20:09	4 06:27 (2)	18:42	16:22	15:23	15:19
30	08:08		06:36		07:02 (1)	05:13	04:13	04:48	05:54	06:25 (2)	06:59	07:06	08:14	08:44
	16:19		19:34	1 07:03 (1)	20:42	21:43	22:03	21:22	20:06	2 06:27 (2)	18:39	16:20	15:22	15:20
31	08:06		06:34	07:00 (1)		04:11		04:50	05:56			07:08	08:44	
	16:21		19:36	4 07:04 (1)		21:44		21:20	20:03			16:17	15:21	
Potential sun hours	227	262	366	429		515	539	538	474	386		321	241	207
Total, worst case			27	33					13	48				
Sun reduction			0,22	0,42					0,35	0,31				
Oper. time red.			0,99	0,99					0,99	0,99				
Wind dir. red.			0,64	0,65					0,66	0,65				
Total reduction			0,14	0,27					0,23	0,20				
Total, real			4	9					3	10				

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (866)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:41	05:08 20:47	04:09 21:47	04:04 22:03	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:49	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:30	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53	04:08 22:00	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:25 15:16
7	08:41 15:31	07:51 16:38	06:40 17:43	06:14 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:31 15:14
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:55	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	08:36 15:40	07:40 16:49	06:27 17:54	06:01 20:03	04:45 21:08	04:00 21:59	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:13	03:59 22:01	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:36 15:12
15	08:33 15:46	07:32 16:57	06:18 18:01	05:52 20:09	04:39 21:15	03:59 22:02	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:37 15:12
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:17	03:59 22:02	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:43	08:38 15:12
17	08:30 15:50	07:28 17:01	06:13 18:05	05:47 20:14	04:35 21:19	03:58 22:03	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:39 15:12
18	08:29 15:52	07:25 17:04	06:10 18:07	05:44 20:16	04:33 21:21	03:58 22:03	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:23 17:06	06:07 18:10	05:42 20:18	04:31 21:23	03:58 22:04	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:25	03:58 22:04	04:29 21:42	05:33 20:33	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	08:24 15:58	07:17 17:11	06:02 18:14	05:36 20:22	04:27 21:27	03:58 22:04	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	07:56 15:34	08:42 15:13
22	08:23 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:28	03:59 22:05	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:43 15:14
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:22 21:32	03:59 22:05	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:05	04:39 21:33	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	08:16 16:09	07:05 17:22	05:48 18:25	05:23 20:34	04:19 21:36	04:00 22:05	04:41 21:31	05:45 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:44 15:16
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:17 21:38	04:00 22:04	04:42 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:30	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 19:32	05:42 20:40	05:16 21:41	04:14 22:04	04:02 21:25	04:46 20:09	05:52 18:42	06:57 16:22	07:04 15:23	08:12 15:19	08:44 15:19
30	08:08 16:19	06:56 19:34	05:40 20:42	05:13 21:43	04:13 22:04	04:03 21:23	04:48 21:23	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:44 15:20
31	08:06 16:21	06:54 19:36	05:38 20:44	05:11 21:44	04:11 22:04	04:00 21:20	04:50 20:03	05:56 16:18	07:08 15:21	07:08 15:21	08:14 15:21	08:44 15:21
Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (829)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	14:04 (B0012) 14:16 (B0012)	08:04 16:23	06:56 17:29	06:31 19:38	04:10 21:46
2	08:43 15:24	14:05 (B0012) 14:16 (B0012)	08:02 16:26	06:54 17:31	06:28 19:40	04:09 21:47
3	08:43 15:25	14:06 (B0012) 14:17 (B0012)	08:00 16:28	06:51 17:34	06:25 19:43	04:08 21:49
4	08:42 15:27	14:07 (B0012) 14:16 (B0012)	07:58 16:30	06:48 17:36	06:22 19:45	04:07 21:50
5	08:42 15:28	14:08 (B0012) 14:16 (B0012)	07:55 16:33	06:46 17:38	06:20 19:47	04:06 21:51
6	08:41 15:30	14:09 (B0012) 14:16 (B0012)	07:53 16:35	06:43 17:40	06:17 19:49	04:05 21:53
7	08:40 15:31	14:10 (B0012) 14:15 (B0012)	07:51 16:37	06:40 17:43	06:14 19:51	04:04 21:54
8	08:40 15:33		07:49 16:40	06:38 17:45	06:11 19:54	04:03 21:55
9	08:39 15:35		07:47 16:42	06:35 17:47	06:09 19:56	04:02 21:56
10	08:38 15:36		07:44 16:45	06:32 17:50	06:06 19:58	04:01 21:57
11	08:37 15:38		07:42 16:47	06:29 17:52	06:03 20:00	04:01 21:58
12	08:36 15:40		07:40 16:49	06:27 17:54	06:00 20:02	04:00 21:59
13	08:35 15:42		07:37 16:52	06:24 17:56	05:58 20:05	04:00 22:00
14	08:34 15:44		07:35 16:54	06:21 17:58	05:55 20:07	03:59 22:01
15	08:32 15:46		07:32 16:56	06:18 18:01	05:52 20:09	03:59 22:01
16	08:31 15:48		07:30 16:59	06:15 18:03	05:50 20:11	03:59 22:02
17	08:30 15:50		07:27 17:01	06:13 18:05	05:47 20:13	03:58 22:03
18	08:28 15:52		07:25 17:03	06:10 18:07	05:44 20:16	03:58 22:03
19	08:27 15:54		07:22 17:06	06:07 18:10	05:42 20:18	03:58 22:04
20	08:26 15:56		07:20 17:08	06:04 18:12	05:39 20:20	03:58 22:04
21	08:24 15:58		07:17 17:11	06:02 18:14	05:36 20:22	03:58 22:04
22	08:22 16:00		07:15 17:13	05:59 18:16	05:34 20:25	03:58 22:04
23	08:21 16:03		07:12 17:15	05:56 18:18	05:31 20:27	03:59 22:05
24	08:19 16:05		07:10 17:18	05:53 18:21	05:28 20:29	03:59 22:05
25	08:17 16:07		07:07 17:20	05:50 18:23	05:26 20:31	03:59 22:05
26	08:16 16:09		07:04 17:22	05:48 18:25	05:23 20:33	04:00 22:04
27	08:14 16:12		07:02 17:24	05:45 18:27	05:21 20:36	04:00 22:04
28	08:12 16:14		06:59 17:27	05:42 18:29	05:18 20:38	04:01 22:04
29	08:10 16:16			06:39 19:32	05:16 20:40	04:02 22:04
30	08:08 16:19			06:36 19:34	05:13 20:42	04:02 22:03
31	08:06 16:21			06:34 19:36	04:11 21:44	
Potential sun hours	228	262	366	429	515	539
Total, worst case	63			6	8	
Sun reduction	0,19			0,42	0,53	
Oper. time red.	0,99			0,99	0,99	
Wind dir. red.	0,69			0,66	0,69	
Total reduction	0,13			0,28	0,36	
Total, real	8			2	3	

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (829)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	06:29 (5) 06:32 (5)	07:02 18:36	07:11 16:15
2	04:04 22:02	04:54 21:16	06:00 19:58	06:31 (5) 06:33 (5)	07:04 18:34	07:13 16:13
3	04:05 22:02	04:57 21:14	06:02 19:55	06:33 (5) 06:34 (5)	07:06 18:31	07:15 16:10
4	04:06 22:01	04:59 21:12	06:04 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:16
7	04:09 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:01	08:26 15:15
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	07:38 15:49	08:34 15:13
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:36 15:12
16	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:55	07:45 15:43	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:38 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	07:55 16:32	08:04 15:28	08:43 15:16
26	04:40 21:30	05:45 20:17	06:51 18:50	07:57 16:30	08:06 15:27	08:43 15:16
27	04:42 21:29	05:47 20:15	06:53 18:48	07:59 16:27	08:08 15:25	08:44 15:17
28	04:44 21:27	05:49 20:13	06:55 18:45	08:01 16:25	08:10 15:24	08:44 15:18
29	04:46 21:24	05:51 20:11	06:57 18:42	08:03 16:23	08:12 15:22	08:44 15:19
30	04:48 21:22	05:53 20:09	06:59 18:39	08:05 16:21	08:14 15:20	08:44 15:20
31	04:50 21:20	05:55 20:07		08:07 16:19	08:16 15:18	08:44 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case	9		6			321
Sun reduction	0,38		0,31			0,13
Oper. time red.	0,99		0,99			0,99
Wind dir. red.	0,69		0,66			0,69
Total reduction	0,26		0,20			0,09
Total, real	2		1			29

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:19>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (898)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:44 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:04 22:03	04:53 21:18	05:58 20:01	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:24	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:09 21:47	04:04 22:03	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:49	04:05 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:52	04:07 22:01	05:01 21:10	06:07 19:50	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:54 16:35	06:43 17:41	06:17 19:49	04:59 20:56	04:05 21:53	04:09 22:00	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:25 15:16
7	08:41 15:32	07:51 16:38	06:41 17:43	06:14 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:12 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:03	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	08:39 15:35	07:47 16:42	06:35 17:48	06:09 19:56	04:52 21:02	04:02 21:56	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:15	07:29 15:57	08:29 15:14
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:56	05:11 20:58	06:17 19:36	07:21 18:12	07:32 15:55	08:31 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:55	05:14 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	08:36 15:40	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:00 21:59	04:16 21:53	05:16 20:53	06:22 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:57	05:58 20:05	04:43 21:11	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:13	03:59 22:01	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:36 15:13
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	04:39 21:15	03:59 22:02	04:21 21:49	05:22 20:45	06:28 19:22	07:32 17:58	07:43 15:45	08:37 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:17	03:59 22:02	04:23 21:48	05:24 20:43	06:30 19:19	07:35 17:56	07:45 15:43	08:38 15:12
17	08:30 15:50	07:28 17:01	06:13 18:05	05:47 20:14	04:35 21:19	03:59 22:03	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:39 15:13
18	08:29 15:52	07:25 17:04	06:10 18:08	05:44 20:16	04:33 21:21	03:58 22:03	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:50 15:40	08:40 15:13
19	08:27 15:54	07:23 17:06	06:07 18:10	05:42 20:18	04:31 21:23	03:58 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:05 18:12	05:39 20:20	04:29 21:25	03:58 22:04	04:30 21:42	05:33 20:33	06:38 19:08	07:43 17:45	07:54 15:36	08:41 15:13
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:27	03:59 22:04	04:31 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:42 15:14
22	08:23 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:29	03:59 22:05	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:43 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:31	08:43 15:15
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:22 21:32	03:59 22:05	04:37 21:35	05:41 20:22	06:47 18:56	07:53 17:35	08:02 15:30	08:43 15:15
25	08:18 16:07	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:33	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	08:16 16:10	07:05 17:22	05:48 18:25	05:24 20:34	04:19 21:36	04:00 22:05	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:44 15:17
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:17 21:38	04:01 22:05	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:26	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:01 22:04	04:45 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:24	08:44 15:18
29	08:10 16:17	06:50 17:32	05:39 18:33	05:16 20:40	04:14 21:41	04:02 22:04	04:47 21:25	05:52 20:09	06:58 18:42	07:04 16:23	15:24	08:44 15:19
30	08:08 16:19	06:51 17:34	05:37 18:34	05:14 20:42	04:13 21:43	04:03 22:04	04:49 21:23	05:54 20:06	07:00 18:39	07:06 16:20	15:22	08:44 15:20
31	08:06 16:21	06:54 17:36	05:34 18:36	05:12 20:44	04:12 21:44	04:02 22:04	04:51 21:21	05:56 20:03	07:09 18:18	07:09 16:18	15:22	08:44 15:22
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
Total, worst case	88											112
Sun reduction	0,19									89		0,13
Oper. time red.	0,99									0,17		0,99
Wind dir. red.	0,55									0,99		0,66
Total reduction	0,10									0,55		0,09
Total, real	9									0,10		10

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (865)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:44 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:41	05:08 20:47	04:09 21:47	04:04 22:03	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:49	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:30	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:56	04:05 21:53	04:08 22:00	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:25 15:16
7	08:41 15:31	07:51 16:38	06:40 17:43	06:14 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:31 15:14
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:55	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	08:36 15:40	07:40 16:49	06:27 17:54	06:01 20:03	04:45 21:08	04:00 21:59	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:13	03:59 22:01	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:36 15:12
15	08:33 15:46	07:32 16:57	06:18 18:01	05:52 20:09	04:39 21:15	03:59 22:02	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:37 15:12
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:17	03:59 22:02	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:43	08:38 15:12
17	08:30 15:50	07:28 17:01	06:13 18:05	05:47 20:14	04:35 21:19	03:58 22:03	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:39 15:12
18	08:29 15:52	07:25 17:04	06:10 18:08	05:44 20:16	04:33 21:21	03:58 22:03	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:23 17:06	06:07 18:10	05:42 20:18	04:31 21:23	03:58 22:04	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:25	03:58 22:04	04:29 21:42	05:33 20:33	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	08:24 15:58	07:17 17:11	06:02 18:14	05:36 20:22	04:27 21:27	03:58 22:04	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	07:56 15:34	08:42 15:13
22	08:23 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:29	03:59 22:05	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:43 15:14
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:22 21:32	03:59 22:05	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:05	04:39 21:33	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	08:16 16:09	07:05 17:22	05:48 18:25	05:23 20:34	04:19 21:36	04:00 22:05	04:41 21:31	05:45 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:44 15:16
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:17 21:38	04:00 22:05	04:42 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:30	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 19:32	05:42 20:40	05:16 21:41	04:14 22:04	04:02 21:25	04:46 20:09	05:52 18:42	06:57 16:22	07:04 15:23	08:12 15:19	08:44 15:19
30	08:08 16:19	06:56 19:34	05:40 20:42	05:13 21:43	04:13 22:04	04:02 21:23	04:48 21:23	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:44 15:20
31	08:06 16:21	06:54 19:36	05:38 20:44	05:11 21:44	04:11 22:04	04:00 21:20	04:50 20:03	05:56 16:18	07:08 15:21	07:08 15:21	08:14 15:21	08:44 15:21
Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (841)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:44 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:41	05:08 20:47	04:09 21:47	04:04 22:03	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:49	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:30	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:56	04:05 21:53	04:08 22:00	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:25 15:16
7	08:41 15:31	07:51 16:38	06:40 17:43	06:14 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
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Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (887)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:44 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
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Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: BROKABO 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (827)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:57 17:29	06:31 19:38	05:11 20:45	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
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27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:17 21:38	04:00 22:05	04:42 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:30	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 19:32	05:42 20:40	05:16 21:41	04:14 22:04	04:02 21:25	04:46 20:09	05:52 18:42	06:57 16:22	07:04 15:23	08:12 15:19	08:44 15:19
30	08:08 16:19	06:56 19:34	05:43 20:42	05:13 21:43	04:13 22:04	04:02 21:23	04:48 20:06	05:54 18:39	07:00 16:20	07:06 15:22	08:14 15:20	08:44 15:20
31	08:06 16:21	06:54 19:36	05:43 20:42	05:13 21:44	04:11 22:04	04:00 21:20	04:50 20:03	05:56 16:18	07:08 15:21	07:08 15:21	08:14 15:21	08:44 15:21
Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÅNHULT 1:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (876)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:02	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21	
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:20	
3	08:42 15:25	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	17:35 (B0023) 17:43 (B0023)	07:15 16:10	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:33 (B0023) 17:44 (B0023)	07:17 16:08	08:21 15:18
5	08:41 15:28	07:55 16:33	06:45 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	17:32 (B0023) 17:45 (B0023)	07:20 16:06	08:22 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	17:31 (B0023) 17:45 (B0023)	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:43	07:14 18:20	17:31 (B0023) 17:45 (B0023)	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	17:31 (B0023) 17:44 (B0023)	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:01	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:32 (B0023) 17:42 (B0023)	07:29 15:57	08:29 15:14
10	08:37 15:37	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	17:32 (B0023) 17:39 (B0023)	07:31 15:55	08:30 15:14
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	17:35 (B0023) 17:36 (B0023)	07:33 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06		07:36 15:51	08:33 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03		07:38 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01		07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58		07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	16:21 (B0024) 18:03	06:15 18:03	05:50 20:11	03:59 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55		07:45 15:43	08:37 15:12
17	08:29 15:50	07:27 17:01	16:18 (B0024) 18:05	06:13 18:05	05:47 20:13	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:51 (B0024) 16:58 (B0024)	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	16:17 (B0024) 18:07	06:10 18:07	05:44 20:15	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:38 17:50	16:49 (B0024) 17:00 (B0024)	07:49 15:39	08:39 15:13
19	08:27 15:54	07:22 17:06	16:17 (B0024) 18:09	06:07 18:09	05:42 20:18	03:58 22:03	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:47	16:48 (B0024) 17:00 (B0024)	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	16:16 (B0024) 18:12	06:04 18:12	05:39 20:20	03:58 22:03	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	16:47 (B0024) 17:00 (B0024)	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	16:16 (B0024) 18:14	06:01 18:14	05:36 20:22	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	16:47 (B0024) 17:01 (B0024)	07:55 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	16:17 (B0024) 18:16	05:59 18:16	05:34 20:24	03:59 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	16:46 (B0024) 17:00 (B0024)	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	16:17 (B0024) 18:18	05:56 18:18	05:31 20:26	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:47 (B0024) 17:00 (B0024)	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	16:18 (B0024) 18:20	05:53 18:20	05:28 20:29	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	16:47 (B0024) 16:59 (B0024)	08:02 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	16:21 (B0024) 18:23	05:50 18:23	05:26 20:31	04:00 21:33	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	15:48 (B0024) 15:57 (B0024)	08:04 15:28	08:43 15:16
26	08:15 16:09	07:04 17:22	16:25 (B0024) 18:25	05:47 18:25	05:23 20:33	04:00 21:35	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	15:52 (B0024) 15:54 (B0024)	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	18:27 18:27	05:45 18:27	05:21 20:35	04:01 21:37	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27		08:08 15:25	08:43 15:17
28	08:11 16:14	06:59 17:27	18:29 18:29	05:42 18:29	05:18 20:37	04:01 21:39	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25		08:10 15:24	08:43 15:18
29	08:10 16:16		18:31 19:31	05:39 19:31	05:16 20:40	04:02 21:40	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22		08:12 15:23	08:43 15:19
30	08:08 16:19		18:33 19:34	06:36 19:34	05:13 20:42	04:03 21:42	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20		08:14 15:20	08:43 15:20
31	08:06 16:21		18:33 19:36	06:33 19:36	04:11 21:44		04:50 21:20	05:56 20:03	07:08 16:17	07:08 16:17		08:43 15:21	08:43 15:21
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207	
Total, worst case		106	90							198			
Sun reduction		0,16	0,22							0,26			
Oper. time red.		0,99	0,99							0,99			
Wind dir. red.		0,69	0,66							0,68			
Total reduction		0,11	0,15							0,17			
Total, real		12	13							34			

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (817)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	14:06 (B0020) 14:08 (B0020)	08:04 16:23	14:56 (B0018) 15:38 (B0019)	06:56 17:29	16:27 (B0017) 19:38
2	08:43 15:24		08:02 16:26	14:57 (B0018) 15:37 (B0019)	06:54 17:31	16:26 (B0017) 19:40
3	08:42 15:25		08:00 16:28	14:59 (B0018) 15:37 (B0019)	06:51 17:34	16:26 (B0017) 19:43
4	08:42 15:27		07:58 16:30	14:59 (B0018) 15:34 (B0019)	06:48 17:36	16:26 (B0017) 19:45
5	08:41 15:28		07:55 16:33	15:01 (B0018) 15:20 (B0018)	06:46 17:38	16:27 (B0017) 19:47
6	08:41 15:30		07:53 16:35	15:02 (B0018) 15:18 (B0018)	06:43 17:40	16:28 (B0017) 19:49
7	08:40 15:31		07:51 16:37	15:05 (B0018) 15:17 (B0018)	06:40 17:43	16:28 (B0017) 19:51
8	08:39 15:33		07:49 16:40	15:09 (B0018) 15:12 (B0018)	06:37 17:45	16:30 (B0017) 19:54
9	08:39 15:35		07:46 16:42		06:35 17:47	16:32 (B0017) 19:56
10	08:38 15:37		07:44 16:45		06:32 17:50	16:53 (B0012) 19:58
11	08:37 15:38		07:42 16:47		06:29 17:52	16:54 (B0012) 20:00
12	08:36 15:40		07:39 16:49	16:12 (B0025) 16:16 (B0025)	06:27 17:54	16:56 (B0012) 20:02
13	08:35 15:42		07:37 16:52	16:11 (B0025) 16:19 (B0025)	06:24 17:56	17:05 (B0012) 20:05
14	08:34 15:44		07:35 16:54	16:10 (B0025) 16:21 (B0025)	06:21 17:58	20:05 20:07
15	08:32 15:46	15:01 (B0018) 15:03 (B0018)	07:32 16:56	16:09 (B0025) 16:23 (B0025)	06:18 18:01	05:52 20:09
16	08:31 15:48	14:59 (B0018) 15:06 (B0018)	07:30 16:59	16:10 (B0025) 16:26 (B0025)	06:15 18:03	20:09 20:11
17	08:30 15:50	14:58 (B0018) 15:09 (B0018)	07:27 17:01	16:10 (B0025) 16:26 (B0025)	06:13 18:05	20:11 20:13
18	08:28 15:52	14:57 (B0018) 15:11 (B0018)	07:25 17:03	16:11 (B0025) 16:26 (B0025)	06:10 18:07	20:13 20:16
19	08:27 15:54	14:56 (B0018) 15:13 (B0018)	07:22 17:06	16:11 (B0025) 16:25 (B0025)	06:07 18:10	20:16 20:18
20	08:25 15:56	14:56 (B0018) 15:16 (B0018)	07:20 17:08	16:12 (B0025) 16:24 (B0025)	06:04 18:12	20:18 20:20
21	08:24 15:58	14:56 (B0018) 15:18 (B0018)	07:17 17:11	16:15 (B0025) 16:22 (B0025)	06:02 18:14	20:20 20:22
22	08:22 16:01	14:55 (B0018) 15:19 (B0018)	07:15 17:13	16:37 (B0017) 16:41 (B0017)	05:59 18:16	20:22 20:24
23	08:21 16:03	14:55 (B0018) 15:24 (B0019)	07:12 17:15	16:33 (B0017) 16:44 (B0017)	05:56 18:18	20:24 20:27
24	08:19 16:05	14:55 (B0018) 15:26 (B0019)	07:10 17:18	16:30 (B0017) 16:46 (B0017)	05:53 18:21	20:27 20:29
25	08:17 16:07	14:55 (B0018) 15:29 (B0019)	07:07 17:20	16:30 (B0017) 16:49 (B0017)	05:50 18:23	20:29 20:31
26	08:15 16:09	14:55 (B0018) 15:31 (B0019)	07:04 17:22	16:28 (B0017) 16:50 (B0017)	05:48 18:25	20:31 20:33
27	08:14 16:12	14:54 (B0018) 15:33 (B0019)	07:02 17:24	16:27 (B0017) 16:50 (B0017)	05:45 18:27	20:33 20:35
28	08:12 16:14	14:55 (B0018) 15:36 (B0019)	06:59 17:27	16:26 (B0017) 16:50 (B0017)	05:42 18:29	20:35 20:38
29	08:10 16:16	14:55 (B0018) 15:38 (B0019)			06:39 19:32	05:16 20:40
30	08:08 16:19	14:56 (B0018) 15:38 (B0019)			06:36 19:34	20:40 20:42
31	08:06 16:21	14:56 (B0018) 15:39 (B0019)			06:34 19:36	20:42 21:44
Potential sun hours	228		262		366	429
Total, worst case	454		429		333	
Sun reduction	0,19		0,16		0,22	
Oper. time red.	0,99		0,99		0,99	
Wind dir. red.	0,69		0,69		0,67	
Total reduction	0,13		0,11		0,15	
Total, real	57		47		49	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (817)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October		November	December
1	04:03	04:52	05:58	07:02	17:36 (B0012)	07:11	08:16
	22:03	21:18	20:00	18:36	7	17:43 (B0012)	15:21
2	04:04	04:54	06:00	07:04	17:33 (B0012)	07:13	08:18
	22:02	21:16	19:57	18:34	12	17:45 (B0012)	15:20
3	04:05	04:57	06:02	07:06	17:31 (B0012)	07:15	08:19
	22:02	21:14	19:55	18:31	14	17:45 (B0012)	15:19
4	04:06	04:59	06:04	07:08	17:12 (B0017)	07:17	08:21
	22:01	21:11	19:52	18:28	23	17:47 (B0012)	15:18
5	04:07	05:01	06:07	07:10	17:08 (B0017)	07:20	08:23
	22:00	21:09	19:49	18:25	30	17:46 (B0012)	15:17
6	04:08	05:03	06:09	07:12	17:05 (B0017)	07:22	08:24
	21:59	21:07	19:46	18:23	34	17:46 (B0012)	15:16
7	04:10	05:05	06:11	07:14	17:03 (B0017)	07:24	08:26
	21:58	21:05	19:44	18:20	37	17:45 (B0012)	15:15
8	04:11	05:07	06:13	07:17	17:03 (B0017)	07:27	08:27
	21:57	21:02	19:41	18:17	37	17:45 (B0012)	15:15
9	04:12	05:09	06:15	07:19	17:01 (B0017)	07:29	08:29
	21:56	21:00	19:38	18:14	37	17:42 (B0012)	15:14
10	04:13	05:11	06:17	07:21	17:00 (B0017)	07:31	08:30
	21:55	20:57	19:35	18:12	33	17:39 (B0012)	15:14
11	04:15	05:13	06:19	07:23	17:00 (B0017)	07:33	08:32
	21:54	20:55	19:33	18:09	31	17:36 (B0012)	15:13
12	04:16	05:15	06:21	07:25	17:00 (B0017)	07:36	08:33
	21:53	20:53	19:30	18:06	30	17:34 (B0022)	15:13
13	04:18	05:18	06:23	07:28	17:00 (B0017)	07:38	08:34
	21:52	20:50	19:27	18:03	25	17:31 (B0022)	15:13
14	04:19	05:20	06:26	07:30	16:59 (B0017)	07:40	08:35
	21:50	20:48	19:24	18:01	24	17:23 (B0017)	15:12
15	04:21	05:22	06:28	07:32	17:00 (B0017)	07:43	08:36
	21:49	20:45	19:21	17:58	23	17:23 (B0017)	15:12
16	04:22	05:24	06:30	07:34	17:01 (B0017)	07:45	08:37
	21:48	20:43	19:18	17:55	20	17:21 (B0017)	15:12
17	04:24	05:26	06:32	07:36	17:01 (B0017)	07:47	08:38
	21:46	20:40	19:16	17:53	18	17:19 (B0017)	15:12
18	04:26	05:28	06:34	07:39	17:03 (B0017)	07:49	08:39
	21:44	20:38	19:13	17:50	14	17:17 (B0017)	15:12
19	04:28	05:30	06:36	07:41	17:05 (B0017)	07:51	08:40
	21:43	20:35	19:10	17:48	9	17:14 (B0017)	15:13
20	04:29	05:33	06:38	07:43		07:54	08:41
	21:41	20:32	19:07	17:45		15:36	15:13
21	04:31	05:35	06:40	07:45	16:44 (B0025)	07:56	08:41
	21:40	20:30	19:04	17:42	9	16:53 (B0025)	15:13
22	04:33	05:37	06:42	07:48	16:42 (B0025)	07:58	08:42
	21:38	20:27	19:02	17:40	12	16:54 (B0025)	15:14
23	04:35	05:39	06:44	07:50	16:41 (B0025)	08:00	08:42
	21:36	20:24	18:59	17:37	15	16:56 (B0025)	15:14
24	04:37	05:41	06:47	07:52	16:40 (B0025)	08:02	08:43
	21:34	20:22	18:56	17:35	16	16:56 (B0025)	15:15
25	04:39	05:43	06:49	06:54	15:40 (B0025)	08:04	08:43
	21:32	20:19	18:53	16:32	16	15:56 (B0025)	15:16
26	04:40	05:45	06:51	06:57	15:39 (B0025)	08:06	08:43
	21:30	20:16	18:50	16:30	16	15:55 (B0025)	15:16
27	04:42	05:47	06:53	06:59	15:40 (B0025)	08:08	08:43
	21:28	20:14	18:48	16:27	13	15:53 (B0025)	15:17
28	04:44	05:50	06:55	07:01	15:40 (B0025)	08:10	08:44
	21:26	20:11	18:45	16:25	10	15:50 (B0025)	15:18
29	04:46	05:52	06:57	07:04	15:41 (B0025)	08:12	08:44
	21:24	20:08	18:42	16:22	7	15:48 (B0025)	15:19
30	04:48	05:54	06:59	07:06	15:42 (B0025)	08:14	08:44
	21:22	20:06	18:39	16:20	3	15:45 (B0025)	15:20
31	04:50	05:56		07:08			08:43
	21:20	20:03		16:17			15:21
Potential sun hours	538	474	386	321		241	207
Total, worst case				575		652	176
Sun reduction				0,26		0,17	0,13
Oper. time red.				0,99		0,99	0,99
Wind dir. red.				0,68		0,69	0,69
Total reduction				0,17		0,12	0,09
Total, real				100		76	16

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (889)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

January			February			March			April	May	June
1	08:43	14:07 (B0020)	08:04	14:58 (B0018)	06:56	16:26 (B0017)	06:31	05:11	04:10		
	15:23	4 14:11 (B0020)	16:23	15:38 (B0019)	17:29	28 16:59 (B0022)	19:38	20:44	21:45		
2	08:43		08:02	14:59 (B0018)	06:54	16:25 (B0017)	06:28	05:08	04:09		
	15:24		16:26	15:38 (B0019)	17:31	30 17:01 (B0012)	19:40	20:46	21:47		
3	08:42		08:00	15:00 (B0018)	06:51	16:25 (B0017)	06:25	05:06	04:08		
	15:25		16:28	15:37 (B0019)	17:34	33 17:03 (B0012)	19:43	20:49	21:48		
4	08:42		07:58	15:00 (B0018)	06:48	16:25 (B0017)	06:22	05:04	04:07		
	15:27		16:30	15:34 (B0019)	17:36	36 17:06 (B0012)	19:45	20:51	21:50		
5	08:41		07:55	15:02 (B0018)	06:46	16:27 (B0017)	06:20	05:01	04:06		
	15:28		16:33	15:21 (B0018)	17:38	37 17:09 (B0012)	19:47	20:53	21:51		
6	08:41		07:53	15:03 (B0018)	06:43	16:28 (B0017)	06:17	04:59	04:05		
	15:30		16:35	15:19 (B0018)	17:40	35 17:09 (B0012)	19:49	20:55	21:52		
7	08:40		07:51	15:06 (B0018)	06:40	16:29 (B0017)	06:14	04:57	04:04		
	15:31		16:37	15:17 (B0018)	17:43	32 17:08 (B0012)	19:51	20:57	21:54		
8	08:39		07:49		06:37	16:31 (B0017)	06:11	04:54	04:03		
	15:33		16:40		17:45	28 17:08 (B0012)	19:54	21:00	21:55		
9	08:39		07:46		06:35	16:51 (B0012)	06:09	04:52	04:02		
	15:35		16:42		17:47	16 17:07 (B0012)	19:56	21:02	21:56		
10	08:38		07:44		06:32	16:53 (B0012)	06:06	04:50	04:01		
	15:37		16:45		17:50	14 17:07 (B0012)	19:58	21:04	21:57		
11	08:37		07:42		06:29	16:54 (B0012)	06:03	04:48	04:01		
	15:38		16:47		17:52	11 17:05 (B0012)	20:00	21:06	21:58		
12	08:36		07:39	16:11 (B0025)	06:27	16:56 (B0012)	06:00	04:45	04:00		
	15:40		16:49	5 16:16 (B0025)	17:54	6 17:02 (B0012)	20:02	21:08	21:59		
13	08:35		07:37	16:11 (B0025)	06:24		05:58	04:43	04:00		
	15:42		16:52	8 16:19 (B0025)	17:56		20:05	21:10	22:00		
14	08:34		07:35	16:10 (B0025)	06:21		05:55	04:41	03:59		
	15:44		16:54	11 16:21 (B0025)	17:58		20:07	21:12	22:01		
15	08:32		07:32	16:09 (B0025)	06:18		05:52	04:39	03:59		
	15:46		16:56	14 16:23 (B0025)	18:01		20:09	21:14	22:01		
16	08:31	15:02 (B0018)	07:30	16:10 (B0025)	06:15		05:50	04:37	03:59		
	15:48	4 15:06 (B0018)	16:59	16:26 (B0025)	18:03		20:11	21:16	22:02		
17	08:30	15:00 (B0018)	07:27	16:10 (B0025)	06:13		05:47	04:35	03:58		
	15:50	9 15:09 (B0018)	17:01	16:25 (B0025)	18:05		20:13	21:18	22:02		
18	08:28	14:59 (B0018)	07:25	16:11 (B0025)	06:10		05:44	04:33	03:58		
	15:52	12 15:11 (B0018)	17:03	16:26 (B0025)	18:07		20:16	21:20	22:03		
19	08:27	14:58 (B0018)	07:22	16:11 (B0025)	06:07		05:42	04:31	03:58		
	15:54	15 15:13 (B0018)	17:06	16:24 (B0025)	18:10		20:18	21:22	22:03		
20	08:25	14:58 (B0018)	07:20	16:12 (B0025)	06:04		05:39	04:29	03:58		
	15:56	18 15:16 (B0018)	17:08	16:23 (B0025)	18:12		20:20	21:24	22:04		
21	08:24	14:58 (B0018)	07:17	16:15 (B0025)	06:01		05:36	04:27	03:58		
	15:58	21 15:19 (B0018)	17:11	16:21 (B0025)	18:14		20:22	21:26	22:04		
22	08:22	14:57 (B0018)	07:15	16:34 (B0017)	05:59		05:34	04:26	03:59		
	16:01	22 15:19 (B0018)	17:13	16:42 (B0017)	18:16		20:24	21:28	22:04		
23	08:21	14:57 (B0018)	07:12	16:31 (B0017)	05:56		05:31	04:24	03:59		
	16:03	25 15:24 (B0019)	17:15	16:44 (B0017)	18:18		20:27	21:30	22:04		
24	08:19	14:57 (B0018)	07:10	16:29 (B0017)	05:53		05:28	04:22	03:59		
	16:05	28 15:26 (B0019)	17:18	16:46 (B0017)	18:21		20:29	21:32	22:04		
25	08:17	14:57 (B0018)	07:07	16:28 (B0017)	05:50		05:26	04:20	04:00		
	16:07	32 15:29 (B0019)	17:20	16:48 (B0017)	18:23		20:31	21:34	22:04		
26	08:15	14:57 (B0018)	07:04	16:27 (B0017)	05:48		05:23	04:19	04:00		
	16:09	34 15:31 (B0019)	17:22	16:49 (B0017)	18:25		20:33	21:36	22:04		
27	08:14	14:56 (B0018)	07:02	16:26 (B0017)	05:45		05:21	04:17	04:01		
	16:12	37 15:33 (B0019)	17:24	16:49 (B0017)	18:27		20:35	21:37	22:04		
28	08:12	14:56 (B0018)	06:59	16:25 (B0017)	05:42		05:18	04:16	04:01		
	16:14	40 15:36 (B0019)	17:27	16:49 (B0017)	18:29		20:38	21:39	22:04		
29	08:10	14:57 (B0018)			06:39		05:16	04:14	04:02		
	16:16	41 15:38 (B0019)			19:32		20:40	21:41	22:04		
30	08:08	14:57 (B0018)			06:36		05:13	04:13	04:03		
	16:19	42 15:39 (B0019)			19:34		20:42	21:42	22:03		
31	08:06	14:58 (B0018)			06:34			04:11			
	16:21	41 15:39 (B0019)			19:36			21:44			
Potential sun hours	228		262		366		429	515	539		
Total, worst case	425		426		306						
Sun reduction	0,19		0,16		0,22						
Oper. time red.	0,99		0,99		0,99						
Wind dir. red.	0,69		0,69		0,67						
Total reduction	0,13		0,11		0,15						
Total, real	54		47		45						

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (889)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:21
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	17:33 (B0012) 17:42 (B0012)	07:13 16:13
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:31 (B0012) 17:43 (B0012)	07:15 16:10
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:30 (B0012) 17:45 (B0012)	07:17 16:08
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:10 (B0017) 17:45 (B0012)	07:20 16:06
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:06 (B0017) 17:45 (B0012)	07:22 16:04
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:04 (B0017) 17:44 (B0012)	07:24 16:01
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	17:03 (B0017) 17:44 (B0012)	07:27 15:59
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:01 (B0017) 17:42 (B0012)	07:29 15:57
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	17:00 (B0017) 17:39 (B0012)	07:31 15:55
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	16:59 (B0017) 17:36 (B0012)	07:33 15:53
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	16:59 (B0017) 17:34 (B0022)	07:36 15:51
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	16:59 (B0017) 17:31 (B0022)	07:38 15:49
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	16:58 (B0017) 17:22 (B0017)	07:40 15:47
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:59 (B0017) 17:22 (B0017)	07:43 15:45
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	16:59 (B0017) 17:20 (B0017)	07:45 15:43
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	17:00 (B0017) 17:19 (B0017)	07:47 15:41
18	04:26 21:44	05:28 20:38	06:34 19:13	07:39 17:50	17:01 (B0017) 17:17 (B0017)	07:49 15:39
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	17:03 (B0017) 17:14 (B0017)	07:51 15:38
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	17:07 (B0017) 17:12 (B0017)	07:54 15:36
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	16:45 (B0025) 16:52 (B0025)	07:56 15:34
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:42 (B0025) 16:53 (B0025)	07:58 15:33
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:41 (B0025) 16:55 (B0025)	08:00 15:31
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:40 (B0025) 16:55 (B0025)	08:02 15:30
25	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	15:40 (B0025) 15:56 (B0025)	08:04 15:28
26	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	15:39 (B0025) 15:55 (B0025)	08:06 15:27
27	04:42 21:28	05:47 20:14	06:53 18:48	06:59 16:27	15:40 (B0025) 15:53 (B0025)	08:08 15:25
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	15:39 (B0025) 15:50 (B0025)	08:10 15:24
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	15:41 (B0025) 15:48 (B0025)	08:12 15:23
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	15:41 (B0025) 15:45 (B0025)	08:14 15:22
31	04:50 21:20	05:56 20:03		07:08 16:17		
Potential sun hours	538	474	386	321	241	207
Total, worst case				550	608	194
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,68	0,69	0,69
Total reduction				0,17	0,12	0,09
Total, real				96	71	18

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (919)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	14:54 (B0018) 15:37 (B0019)	06:56 17:29	16:26 (B0017) 16:59 (B0022)	06:31 19:38
2	08:43 15:24	08:02 16:26	14:55 (B0018) 15:36 (B0019)	06:54 17:31	16:26 (B0017) 17:01 (B0022)	06:28 19:40
3	08:42 15:25	08:00 16:28	14:57 (B0018) 15:36 (B0019)	06:51 17:34	16:25 (B0017) 17:03 (B0012)	06:25 19:43
4	08:42 15:27	07:58 16:30	14:57 (B0018) 15:33 (B0019)	06:48 17:36	16:25 (B0017) 17:06 (B0012)	06:22 19:45
5	08:41 15:28	07:55 16:33	14:59 (B0018) 15:18 (B0018)	06:46 17:38	16:27 (B0017) 17:09 (B0012)	06:20 19:47
6	08:41 15:30	07:53 16:35	15:00 (B0018) 15:16 (B0018)	06:43 17:40	16:27 (B0017) 17:10 (B0012)	06:17 19:49
7	08:40 15:31	07:51 16:37	15:03 (B0018) 15:15 (B0018)	06:40 17:43	16:28 (B0017) 17:10 (B0012)	06:14 19:51
8	08:39 15:33	07:49 16:40	15:15 (B0018) 16:11 (B0025)	06:37 17:45	16:29 (B0017) 17:10 (B0012)	06:11 19:54
9	08:39 15:35	07:46 16:42	16:11 (B0025) 16:16 (B0025)	06:35 17:47	16:31 (B0017) 17:09 (B0012)	06:09 19:56
10	08:38 15:37	07:44 16:45	16:16 (B0025) 16:22 (B0025)	06:32 17:50	16:36 (B0017) 17:09 (B0012)	06:06 19:58
11	08:37 15:38	07:42 16:47	16:22 (B0025) 16:26 (B0025)	06:29 17:52	16:54 (B0012) 17:08 (B0012)	06:03 20:00
12	08:36 15:40	07:39 16:49	16:26 (B0025) 16:31 (B0025)	06:27 17:54	16:55 (B0012) 17:06 (B0012)	06:00 20:02
13	08:35 15:42	07:37 16:52	16:31 (B0025) 16:36 (B0025)	06:24 17:56	16:58 (B0012) 17:02 (B0012)	05:58 20:05
14	08:34 15:44	15:00 (B0018) 15:02 (B0018)	16:36 (B0025) 16:41 (B0025)	06:21 17:58	05:55 20:07	04:41 21:12
15	08:32 15:46	14:57 (B0018) 15:03 (B0018)	16:41 (B0025) 16:46 (B0025)	06:18 18:01	05:52 20:09	04:39 21:14
16	08:31 15:48	14:57 (B0018) 15:06 (B0018)	16:46 (B0025) 16:51 (B0025)	06:15 18:03	05:50 20:11	04:37 21:16
17	08:30 15:50	14:55 (B0018) 15:09 (B0018)	16:51 (B0025) 16:56 (B0025)	06:13 18:05	05:47 20:13	04:35 21:18
18	08:28 15:52	14:54 (B0018) 15:11 (B0018)	16:56 (B0025) 16:61 (B0025)	06:10 18:07	05:44 20:16	04:33 21:20
19	08:27 15:54	14:54 (B0018) 15:13 (B0018)	16:61 (B0025) 16:66 (B0025)	06:07 18:10	05:42 20:18	04:31 21:22
20	08:25 15:56	14:54 (B0018) 15:16 (B0018)	16:66 (B0025) 16:71 (B0025)	06:04 18:12	05:39 20:20	04:29 21:24
21	08:24 15:58	14:53 (B0018) 15:17 (B0018)	16:71 (B0025) 16:76 (B0025)	06:02 18:14	05:36 20:22	04:27 21:26
22	08:22 16:01	14:53 (B0018) 15:17 (B0018)	16:76 (B0025) 16:81 (B0025)	05:59 18:16	05:34 20:24	04:26 21:28
23	08:21 16:03	14:53 (B0018) 15:24 (B0019)	16:81 (B0025) 16:86 (B0025)	05:56 18:18	05:31 20:27	04:24 21:30
24	08:19 16:05	14:53 (B0018) 15:26 (B0019)	16:86 (B0025) 16:91 (B0025)	05:53 18:21	05:29 20:29	04:22 21:32
25	08:17 16:07	14:53 (B0018) 15:29 (B0019)	16:91 (B0025) 16:96 (B0025)	05:50 18:23	05:26 20:31	04:20 21:34
26	08:15 16:09	14:53 (B0018) 15:31 (B0019)	16:96 (B0025) 17:01 (B0025)	05:48 18:25	05:23 20:33	04:19 21:36
27	08:14 16:12	14:52 (B0018) 15:33 (B0019)	17:01 (B0025) 17:06 (B0025)	05:45 18:27	05:21 20:35	04:17 21:37
28	08:12 16:14	14:53 (B0018) 15:36 (B0019)	17:06 (B0025) 17:11 (B0025)	05:42 18:29	05:18 20:38	04:16 21:39
29	08:10 16:16	14:53 (B0018) 15:37 (B0019)	17:11 (B0025) 17:16 (B0025)	06:39 19:32	05:16 20:40	04:14 21:41
30	08:08 16:19	14:54 (B0018) 15:38 (B0019)	17:16 (B0025) 17:21 (B0025)	06:36 19:34	05:13 20:42	04:13 21:42
31	08:06 16:21	14:54 (B0018) 15:38 (B0019)	17:21 (B0025) 17:26 (B0025)	06:34 19:36	04:11 21:44	22:03
Potential sun hours	228	262	366	429	515	539
Total, worst case	487	425	350			
Sun reduction	0,19	0,16	0,22			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,69	0,67			
Total reduction	0,13	0,11	0,15			
Total, real	61	47	52			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (919)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October		November	December
1	04:03	04:52	05:58	07:02	17:35 (B0012)	07:11	08:16
	22:03	21:18	20:00	18:36	9	17:44 (B0012)	15:21
2	04:04	04:55	06:00	07:04	17:32 (B0012)	07:13	08:18
	22:02	21:16	19:57	18:34	13	17:45 (B0012)	15:20
3	04:05	04:57	06:02	07:06	17:31 (B0012)	07:15	08:19
	22:02	21:14	19:55	18:31	15	17:46 (B0012)	15:19
4	04:06	04:59	06:04	07:08	17:10 (B0017)	07:17	08:21
	22:01	21:11	19:52	18:28	27	17:47 (B0012)	15:18
5	04:07	05:01	06:07	07:10	17:07 (B0017)	07:20	08:23
	22:00	21:09	19:49	18:25	33	17:47 (B0012)	15:17
6	04:08	05:03	06:09	07:12	17:05 (B0017)	07:22	08:24
	21:59	21:07	19:46	18:23	35	17:46 (B0012)	15:16
7	04:10	05:05	06:11	07:14	17:03 (B0017)	07:24	08:26
	21:58	21:05	19:44	18:20	39	17:46 (B0012)	15:15
8	04:11	05:07	06:13	07:17	17:02 (B0017)	07:27	08:27
	21:57	21:02	19:41	18:17	39	17:45 (B0012)	15:15
9	04:12	05:09	06:15	07:19	17:01 (B0017)	07:29	08:29
	21:56	21:00	19:38	18:14	36	17:42 (B0012)	15:14
10	04:13	05:11	06:17	07:21	17:00 (B0017)	07:31	08:30
	21:55	20:57	19:35	18:12	34	17:39 (B0012)	15:14
11	04:15	05:13	06:19	07:23	16:59 (B0017)	07:33	08:32
	21:54	20:55	19:33	18:09	32	17:36 (B0012)	15:13
12	04:16	05:15	06:21	07:25	17:00 (B0017)	07:36	08:33
	21:53	20:53	19:30	18:06	29	17:34 (B0022)	15:13
13	04:18	05:18	06:23	07:28	16:59 (B0017)	07:38	08:34
	21:52	20:50	19:27	18:03	26	17:31 (B0022)	15:13
14	04:19	05:20	06:26	07:30	16:59 (B0017)	07:40	08:35
	21:50	20:48	19:24	18:01	24	17:23 (B0017)	15:12
15	04:21	05:22	06:28	07:32	17:00 (B0017)	07:43	08:36
	21:49	20:45	19:21	17:58	23	17:23 (B0017)	15:12
16	04:22	05:24	06:30	07:34	17:00 (B0017)	07:45	08:37
	21:48	20:43	19:18	17:55	21	17:21 (B0017)	15:12
17	04:24	05:26	06:32	07:36	17:01 (B0017)	07:47	08:38
	21:46	20:40	19:16	17:53	18	17:19 (B0017)	15:12
18	04:26	05:28	06:34	07:39	17:03 (B0017)	07:49	08:39
	21:44	20:38	19:13	17:50	14	17:17 (B0017)	15:12
19	04:28	05:30	06:36	07:41	17:05 (B0017)	07:51	08:40
	21:43	20:35	19:10	17:48	9	17:14 (B0017)	15:13
20	04:29	05:33	06:38	07:43	16:48 (B0025)	07:54	08:41
	21:41	20:32	19:07	17:45	2	16:50 (B0025)	15:13
21	04:31	05:35	06:40	07:45	16:44 (B0025)	07:56	08:41
	21:40	20:30	19:04	17:42	9	16:53 (B0025)	15:13
22	04:33	05:37	06:42	07:48	16:41 (B0025)	07:58	08:42
	21:38	20:27	19:02	17:40	13	16:54 (B0025)	15:14
23	04:35	05:39	06:44	07:50	16:41 (B0025)	08:00	08:42
	21:36	20:24	18:59	17:37	14	16:55 (B0025)	15:14
24	04:37	05:41	06:47	07:52	16:39 (B0025)	08:02	08:43
	21:34	20:22	18:56	17:35	16	16:55 (B0025)	15:15
25	04:39	05:43	06:49	06:54	15:40 (B0025)	08:04	08:43
	21:32	20:19	18:53	16:32	16	15:56 (B0025)	15:16
26	04:40	05:45	06:51	06:57	15:39 (B0025)	08:06	08:43
	21:30	20:16	18:50	16:30	16	15:55 (B0025)	15:16
27	04:42	05:47	06:53	06:59	15:39 (B0025)	08:08	08:43
	21:28	20:14	18:48	16:27	14	15:53 (B0025)	15:15
28	04:44	05:50	06:55	07:01	15:39 (B0025)	08:10	08:44
	21:26	20:11	18:45	16:25	11	15:50 (B0025)	15:14
29	04:46	05:52	06:57	07:04	15:41 (B0025)	08:12	08:44
	21:24	20:08	18:42	16:22	7	15:48 (B0025)	15:19
30	04:48	05:54	06:59	07:06	15:41 (B0025)	08:14	08:44
	21:22	20:06	18:39	16:20	4	15:45 (B0025)	15:20
31	04:50	05:56		07:08			08:43
	21:20	20:03		16:17			15:21
Potential sun hours	538	474	386	321		241	207
Total, worst case				598		685	152
Sun reduction				0,26		0,17	0,13
Oper. time red.				0,99		0,99	0,99
Wind dir. red.				0,68		0,69	0,69
Total reduction				0,17		0,12	0,09
Total, real				104		80	14

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (830)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	08:43		14:13 (B0020)	08:04		15:31 (B0018)	06:56		16:33 (B0025)	06:31	05:11	04:10
	15:23	16	14:29 (B0020)	16:23	16	15:47 (B0019)	17:29	8	16:41 (B0025)	19:38	20:44	21:45
2	08:43		14:13 (B0020)	08:02		15:30 (B0018)	06:54			06:28	05:08	04:09
	15:24	16	14:29 (B0020)	16:26	20	15:50 (B0019)	17:31			19:40	20:46	21:47
3	08:42		14:14 (B0020)	08:00		15:29 (B0018)	06:51			06:25	05:06	04:08
	15:26	16	14:30 (B0020)	16:28	24	15:53 (B0019)	17:34			19:43	20:49	21:48
4	08:42		14:15 (B0020)	07:58		15:27 (B0018)	06:48			06:22	05:04	04:07
	15:27	15	14:30 (B0020)	16:30	28	15:55 (B0019)	17:36			19:45	20:51	21:50
5	08:41		14:15 (B0020)	07:55		15:27 (B0018)	06:46			06:20	05:01	04:06
	15:28	15	14:30 (B0020)	16:33	31	15:58 (B0019)	17:38			19:47	20:53	21:51
6	08:41		14:16 (B0020)	07:53		15:26 (B0018)	06:43			06:17	04:59	04:05
	15:30	14	14:30 (B0020)	16:35	34	16:00 (B0014)	17:40			19:49	20:55	21:52
7	08:40		14:17 (B0020)	07:51		15:26 (B0018)	06:40		17:01 (B0017)	06:14	04:57	04:04
	15:31	13	14:30 (B0020)	16:37	37	16:03 (B0014)	17:43	12	17:13 (B0022)	19:51	20:57	21:54
8	08:39		14:17 (B0020)	07:49		15:25 (B0018)	06:37		16:58 (B0017)	06:11	04:54	04:03
	15:33	13	14:30 (B0020)	16:40	40	16:05 (B0014)	17:45	17	17:15 (B0022)	19:54	21:00	21:55
9	08:39		14:19 (B0020)	07:46		15:26 (B0018)	06:35		16:56 (B0017)	06:09	04:52	04:02
	15:35	11	14:30 (B0020)	16:42	39	16:05 (B0014)	17:47	21	17:17 (B0022)	19:56	21:02	21:56
10	08:38		14:19 (B0020)	07:44		15:25 (B0018)	06:32		16:56 (B0017)	06:06	04:50	04:01
	15:37	10	14:29 (B0020)	16:45	38	16:03 (B0014)	17:50	25	17:21 (B0022)	19:58	21:04	21:57
11	08:37		14:21 (B0020)	07:42		15:26 (B0018)	06:29		16:55 (B0017)	06:03	04:48	04:01
	15:38	8	14:29 (B0020)	16:47	31	15:57 (B0019)	17:52	28	17:23 (B0012)	20:00	21:06	21:58
12	08:36		14:23 (B0020)	07:39		15:25 (B0018)	06:27		16:54 (B0017)	06:00	04:45	04:00
	15:40	5	14:28 (B0020)	16:49	30	15:55 (B0019)	17:54	31	17:25 (B0012)	20:02	21:08	21:59
13	08:35			07:37		15:26 (B0018)	06:24		16:53 (B0017)	05:58	04:43	04:00
	15:42			16:52	28	15:54 (B0018)	17:56	34	17:27 (B0012)	20:05	21:10	22:00
14	08:34			07:35		15:26 (B0018)	06:21		16:52 (B0017)	05:55	04:41	03:59
	15:44			16:54	27	15:53 (B0018)	17:58	36	17:28 (B0012)	20:07	21:12	22:01
15	08:32			07:32		15:27 (B0018)	06:18		16:52 (B0017)	05:52	04:39	03:59
	15:46			16:56	25	15:52 (B0018)	18:01	36	17:28 (B0012)	20:09	21:14	22:01
16	08:31			07:30		15:28 (B0018)	06:15		16:53 (B0017)	05:50	04:37	03:59
	15:48			16:59	24	15:52 (B0018)	18:03	36	17:29 (B0012)	20:11	21:16	22:02
17	08:30			07:27		15:29 (B0018)	06:13		16:53 (B0017)	05:47	04:35	03:58
	15:50			17:01	22	15:51 (B0018)	18:05	35	17:28 (B0012)	20:13	21:18	22:02
18	08:28			07:25		15:31 (B0018)	06:10		16:54 (B0017)	05:44	04:33	03:58
	15:52			17:03	19	15:50 (B0018)	18:07	33	17:27 (B0012)	20:16	21:20	22:03
19	08:27			07:22		15:33 (B0018)	06:07		16:55 (B0017)	05:42	04:31	03:58
	15:54			17:06	15	15:48 (B0018)	18:10	31	17:26 (B0012)	20:18	21:22	22:03
20	08:25			07:20		15:36 (B0018)	06:04		16:56 (B0017)	05:39	04:29	03:58
	15:56			17:08	12	16:36 (B0025)	18:12	26	17:24 (B0012)	20:20	21:24	22:04
21	08:24			07:17		16:31 (B0025)	06:01		16:59 (B0017)	05:36	04:27	03:58
	15:58			17:11	8	16:39 (B0025)	18:14	16	17:22 (B0012)	20:22	21:26	22:04
22	08:22			07:15		16:30 (B0025)	05:59			05:34	04:26	03:59
	16:01			17:13	12	16:42 (B0025)	18:16			20:24	21:28	22:04
23	08:21			07:12		16:29 (B0025)	05:56			05:31	04:24	03:59
	16:03			17:15	15	16:44 (B0025)	18:18			20:27	21:30	22:04
24	08:19			07:10		16:28 (B0025)	05:53			05:29	04:22	03:59
	16:05			17:18	17	16:45 (B0025)	18:21			20:29	21:32	22:04
25	08:17			07:07		16:29 (B0025)	05:50			05:26	04:20	04:00
	16:07			17:20	17	16:46 (B0025)	18:23			20:31	21:34	22:04
26	08:15			07:04		16:29 (B0025)	05:48			05:23	04:19	04:00
	16:09			17:22	16	16:45 (B0025)	18:25			20:33	21:36	22:04
27	08:14			07:02		16:29 (B0025)	05:45			05:21	04:17	04:01
	16:12			17:24	15	16:44 (B0025)	18:27			20:35	21:37	22:04
28	08:12			06:59		16:30 (B0025)	05:42			05:18	04:16	04:01
	16:14			17:27	12	16:42 (B0025)	18:29			20:38	21:39	22:04
29	08:10						06:39			05:16	04:14	04:02
	16:16						19:32			20:40	21:41	22:04
30	08:08						06:36			05:13	04:13	04:03
	16:19						19:34			20:42	21:42	22:03
31	08:06		15:34 (B0018)				06:34				04:11	
	16:21	10	15:44 (B0018)				19:36				21:44	
Potential sun hours	228			262			366			429	515	539
Total, worst case		162			652			425				
Sun reduction		0,19			0,16			0,22				
Oper. time red.		0,99			0,99			0,99				
Wind dir. red.		0,70			0,69			0,66				
Total reduction		0,13			0,11			0,14				
Total, real		21			72			61				

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (830) Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December			
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	17:33 (B0017) 18:05 (B0012)	07:11 16:15	14:55 (B0018) 15:33 (B0014)	08:16 15:21	14:03 (B0020) 14:11 (B0020)
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	17:32 (B0017) 18:02 (B0012)	07:13 16:13	14:55 (B0018) 15:35 (B0014)	08:18 15:20	14:02 (B0020) 14:12 (B0020)
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:33 (B0017) 17:59 (B0022)	07:15 16:10	14:55 (B0018) 15:34 (B0014)	08:19 15:19	14:02 (B0020) 14:13 (B0020)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:34 (B0017) 17:57 (B0022)	07:17 16:08	14:56 (B0018) 15:32 (B0014)	08:21 15:18	14:02 (B0020) 14:14 (B0020)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:35 (B0017) 17:54 (B0022)	07:20 16:06	14:56 (B0018) 15:29 (B0019)	08:23 15:17	14:02 (B0020) 14:15 (B0020)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:36 (B0017) 17:51 (B0022)	07:22 16:04	14:57 (B0018) 15:27 (B0019)	08:24 15:16	14:02 (B0020) 14:16 (B0020)
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:39 (B0017) 17:48 (B0022)	07:24 16:01	14:58 (B0018) 15:25 (B0019)	08:26 15:15	14:02 (B0020) 14:17 (B0020)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	17:48 (B0022) 17:09 (B0025)	07:27 16:01	14:59 (B0018) 15:22 (B0019)	08:27 15:15	14:02 (B0020) 14:17 (B0020)
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:09 (B0025) 17:12 (B0025)	07:29 16:01	15:00 (B0018) 15:20 (B0019)	08:29 15:14	14:02 (B0020) 14:18 (B0020)
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	17:12 (B0025) 17:05 (B0025)	07:31 16:01	15:02 (B0018) 15:17 (B0019)	08:30 15:14	14:03 (B0020) 14:19 (B0020)
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	17:05 (B0025) 17:09 (B0025)	07:33 16:01	15:05 (B0018) 15:14 (B0018)	08:32 15:13	14:03 (B0020) 14:19 (B0020)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	17:09 (B0025) 17:12 (B0025)	07:36 16:01	15:05 (B0018) 15:13	08:33 15:13	14:03 (B0020) 14:19 (B0020)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	17:05 (B0025) 17:15 (B0025)	07:38 16:01	15:05 (B0018) 15:13	08:34 15:13	14:04 (B0020) 14:20 (B0020)
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	17:03 (B0025) 17:16 (B0025)	07:40 16:01	15:05 (B0018) 15:12	08:35 15:12	14:04 (B0020) 14:20 (B0020)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	17:02 (B0025) 17:17 (B0025)	07:43 16:01	15:06 (B0018) 15:12	08:36 15:12	14:05 (B0020) 14:21 (B0020)
16	04:23 21:48	05:24 20:43	06:30 19:18	07:34 17:55	17:01 (B0025) 17:17 (B0025)	07:45 16:01	15:07 (B0018) 15:12	08:37 15:12	14:05 (B0020) 14:21 (B0020)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	17:00 (B0025) 17:17 (B0025)	07:47 16:01	15:08 (B0018) 15:12	08:38 15:12	14:05 (B0020) 14:22 (B0020)
18	04:26 21:44	05:28 20:38	06:34 19:13	07:39 17:50	17:00 (B0025) 17:17 (B0025)	07:49 16:01	15:09 (B0018) 15:13	08:39 15:13	14:06 (B0020) 14:22 (B0020)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	17:00 (B0025) 17:14 (B0025)	07:51 16:01	15:10 (B0018) 15:13	08:40 15:13	14:07 (B0020) 14:23 (B0020)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	17:01 (B0025) 17:12 (B0025)	07:54 16:01	15:11 (B0018) 15:13	08:41 15:13	14:06 (B0020) 14:23 (B0020)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	17:01 (B0025) 17:09 (B0025)	07:56 16:01	15:12 (B0018) 15:13	08:41 15:13	14:07 (B0020) 14:23 (B0020)
22	04:33 21:38	05:37 20:27	06:42 19:02	17:45 (B0017) 18:05 (B0012)	07:48 17:40	16:05 (B0018) 15:33	15:14 15:14	08:42 15:14	14:07 (B0020) 14:23 (B0020)
23	04:35 21:36	05:39 20:24	06:44 18:59	17:41 (B0017) 18:08 (B0012)	07:50 17:37	16:03 (B0018) 15:31	15:15 15:14	08:42 15:14	14:08 (B0020) 14:25 (B0020)
24	04:37 21:34	05:41 20:22	06:47 18:56	17:39 (B0017) 18:09 (B0012)	07:52 17:35	16:00 (B0018) 15:30	15:16 15:15	08:43 15:15	14:09 (B0020) 14:25 (B0020)
25	04:39 21:32	05:43 20:19	06:49 18:53	17:37 (B0017) 18:10 (B0012)	06:54 16:32	14:59 (B0018) 15:28	15:16 15:16	08:43 15:16	14:09 (B0020) 14:25 (B0020)
26	04:41 21:30	05:45 20:16	06:51 18:50	17:35 (B0017) 18:10 (B0012)	06:57 16:30	14:57 (B0018) 15:27	15:17 15:16	08:43 15:16	14:09 (B0020) 14:25 (B0020)
27	04:42 21:28	05:47 20:14	06:53 18:48	17:34 (B0017) 18:09 (B0012)	06:59 16:27	14:57 (B0018) 15:25	15:18 15:17	08:43 15:17	14:10 (B0020) 14:26 (B0020)
28	04:44 21:26	05:50 20:11	06:55 18:45	17:33 (B0017) 18:09 (B0012)	07:01 16:25	14:56 (B0018) 15:24	15:19 15:18	08:44 15:18	14:10 (B0020) 14:26 (B0020)
29	04:46 21:24	05:52 20:08	06:57 18:42	17:33 (B0017) 18:09 (B0012)	07:04 16:22	14:56 (B0018) 15:23	15:20 15:19	08:44 15:19	14:11 (B0020) 14:27 (B0020)
30	04:48 21:22	05:54 20:06	06:59 18:39	17:33 (B0017) 18:08 (B0012)	07:06 16:20	14:55 (B0018) 15:22	15:21 15:20	08:44 15:20	14:12 (B0020) 14:28 (B0020)
31	04:50 21:20	05:56 20:03		18:08 (B0012) 16:17	17:33 (B0017) 15:31 (B0014)	07:08 15:22	15:21 15:21	08:43 15:21	14:12 (B0020) 14:28 (B0020)
Potential sun hours	538	474	386	321	241	207			
Total, worst case			275	520	314	469			
Sun reduction			0,31	0,26	0,17	0,13			
Oper. time red.			0,99	0,99	0,99	0,99			
Wind dir. red.			0,66	0,68	0,69	0,70			
Total reduction			0,20	0,17	0,12	0,09			
Total, real			56	91	37	43			

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (868)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

January			February			March			April	May	June
1	08:43	14:10 (B0020)	08:04	15:22 (B0018)	06:56				06:31	05:11	04:10
	15:23	14:25 (B0020)	16:23	15:47 (B0019)	17:29				19:38	20:44	21:45
2	08:43	14:10 (B0020)	08:02	15:22 (B0018)	06:54				06:28	05:08	04:09
	15:24	14:25 (B0020)	16:26	15:50 (B0019)	17:31				19:40	20:46	21:47
3	08:42	14:12 (B0020)	08:00	15:21 (B0018)	06:51				06:25	05:06	04:08
	15:26	14:26 (B0020)	16:28	15:53 (B0019)	17:34				19:43	20:49	21:48
4	08:42	14:12 (B0020)	07:58	15:20 (B0018)	06:48				06:22	05:04	04:07
	15:27	14:26 (B0020)	16:30	15:55 (B0019)	17:36				19:45	20:51	21:50
5	08:41	14:13 (B0020)	07:55	15:20 (B0018)	06:46		17:00 (B0017)	06:20	05:01	04:06	
	15:28	14:26 (B0020)	16:33	15:58 (B0014)	17:38	7	17:07 (B0017)	19:47	20:53	21:51	
6	08:41	14:13 (B0020)	07:53	15:20 (B0018)	06:43		16:56 (B0017)	06:17	04:59	04:05	
	15:30	14:26 (B0020)	16:35	16:00 (B0014)	17:40	15	17:11 (B0022)	19:49	20:55	21:52	
7	08:40	14:14 (B0020)	07:51	15:20 (B0018)	06:40		16:54 (B0017)	06:14	04:57	04:04	
	15:31	14:26 (B0020)	16:37	16:03 (B0014)	17:43	19	17:13 (B0022)	19:51	20:57	21:54	
8	08:39	14:16 (B0020)	07:49	15:19 (B0018)	06:37		16:52 (B0017)	06:11	04:54	04:03	
	15:33	14:26 (B0020)	16:40	16:02 (B0014)	17:45	23	17:15 (B0022)	19:54	21:00	21:55	
9	08:39	14:17 (B0020)	07:46	15:20 (B0018)	06:35		16:51 (B0017)	06:09	04:52	04:02	
	15:35	14:26 (B0020)	16:42	16:01 (B0014)	17:47	26	17:17 (B0022)	19:56	21:02	21:56	
10	08:38	14:18 (B0020)	07:44	15:20 (B0018)	06:32		16:51 (B0017)	06:06	04:50	04:01	
	15:37	14:24 (B0020)	16:45	15:53 (B0019)	17:50	30	17:21 (B0012)	19:58	21:04	21:57	
11	08:37		07:42	15:21 (B0018)	06:29		16:50 (B0017)	06:03	04:48	04:01	
	15:38		16:47	15:52 (B0019)	17:52	33	17:23 (B0012)	20:00	21:06	21:58	
12	08:36		07:39	15:21 (B0018)	06:27		16:49 (B0017)	06:00	04:45	04:00	
	15:40		16:49	15:48 (B0018)	17:54	36	17:25 (B0012)	20:02	21:08	21:59	
13	08:35		07:37	15:22 (B0018)	06:24		16:49 (B0017)	05:58	04:43	04:00	
	15:42		16:52	15:48 (B0018)	17:56	37	17:26 (B0012)	20:05	21:10	22:00	
14	08:34		07:35	15:22 (B0018)	06:21		16:49 (B0017)	05:55	04:41	03:59	
	15:44		16:54	15:47 (B0018)	17:58	37	17:26 (B0012)	20:07	21:12	22:01	
15	08:32		07:32	15:23 (B0018)	06:18		16:49 (B0017)	05:52	04:39	03:59	
	15:46		16:56	15:45 (B0018)	18:01	36	17:25 (B0012)	20:09	21:14	22:01	
16	08:31		07:30	15:25 (B0018)	06:15		16:50 (B0017)	05:50	04:37	03:59	
	15:48		16:59	15:45 (B0018)	18:03	36	17:26 (B0012)	20:11	21:16	22:02	
17	08:30		07:27	15:27 (B0018)	06:13		16:50 (B0017)	05:47	04:35	03:58	
	15:50		17:01	15:43 (B0018)	18:05	35	17:25 (B0012)	20:13	21:18	22:02	
18	08:28		07:25	15:30 (B0018)	06:10		16:51 (B0017)	05:44	04:33	03:58	
	15:52		17:03	16:32 (B0025)	18:07	33	17:24 (B0012)	20:16	21:20	22:03	
19	08:27		07:22	16:29 (B0025)	06:07		16:53 (B0017)	05:42	04:31	03:58	
	15:54		17:06	16:34 (B0025)	18:10	26	17:22 (B0012)	20:18	21:22	22:03	
20	08:25		07:20	16:27 (B0025)	06:04		16:56 (B0017)	05:39	04:29	03:58	
	15:56		17:08	16:36 (B0025)	18:12	14	17:19 (B0012)	20:20	21:24	22:04	
21	08:24		07:17	16:27 (B0025)	06:01			05:36	04:27	03:58	
	15:58		17:11	16:39 (B0025)	18:14			20:22	21:26	22:04	
22	08:22		07:15	16:26 (B0025)	05:59			05:34	04:26	03:59	
	16:01		17:13	16:42 (B0025)	18:16			20:24	21:28	22:04	
23	08:21		07:12	16:26 (B0025)	05:56			05:31	04:24	03:59	
	16:03		17:15	16:43 (B0025)	18:18			20:27	21:30	22:04	
24	08:19		07:10	16:25 (B0025)	05:53			05:29	04:22	03:59	
	16:05		17:18	16:42 (B0025)	18:21			20:29	21:32	22:04	
25	08:17		07:07	16:27 (B0025)	05:50			05:26	04:20	04:00	
	16:07		17:20	16:42 (B0025)	18:23			20:31	21:34	22:04	
26	08:15		07:04	16:27 (B0025)	05:48			05:23	04:19	04:00	
	16:09		17:22	16:41 (B0025)	18:25			20:33	21:36	22:04	
27	08:14		07:02	16:28 (B0025)	05:45			05:21	04:17	04:01	
	16:12		17:24	16:40 (B0025)	18:27			20:35	21:37	22:04	
28	08:12	15:30 (B0018)	06:59	16:30 (B0025)	05:42			05:18	04:16	04:01	
	16:14	15:34 (B0018)	17:27	16:37 (B0025)	18:29			20:38	21:39	22:04	
29	08:10	15:26 (B0018)			06:39			05:16	04:14	04:02	
	16:16	15:38 (B0018)			19:32			20:40	21:41	22:04	
30	08:08	15:25 (B0018)			06:36			05:13	04:13	04:03	
	16:19	15:42 (B0019)			19:34			20:42	21:42	22:03	
31	08:06	15:24 (B0018)			06:34				04:11		
	16:21	15:45 (B0019)			19:36				21:44		
Potential sun hours	228		262		366			429	515	539	
Total, worst case	175		660		443						
Sun reduction	0,19		0,16		0,22						
Oper. time red.	0,99		0,99		0,99						
Wind dir. red.	0,69		0,69		0,66						
Total reduction	0,13		0,11		0,15						
Total, real	22		73		64						

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (868)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December				
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	17:28 (B0017) 18:05 (B0012)	07:11 16:15	14:49 (B0018) 15:28 (B0014)	08:16 15:21		
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	17:28 (B0017) 18:02 (B0012)	07:13 16:13	14:50 (B0018) 15:31 (B0014)	08:18 15:20	14:01 (B0020)	14:07 (B0020)
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:28 (B0017) 17:59 (B0012)	07:15 16:10	14:49 (B0018) 15:32 (B0014)	08:19 15:19	14:00 (B0020)	14:09 (B0020)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:29 (B0017) 17:57 (B0022)	07:17 16:08	14:50 (B0018) 15:32 (B0014)	08:21 15:18	14:00 (B0020)	14:10 (B0020)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:29 (B0017) 17:54 (B0022)	07:20 16:06	14:49 (B0018) 15:29 (B0014)	08:23 15:17	14:00 (B0020)	14:11 (B0020)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:29 (B0017) 17:51 (B0022)	07:22 16:04	14:50 (B0018) 15:27 (B0014)	08:24 15:16	14:00 (B0020)	14:12 (B0020)
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:30 (B0017) 17:48 (B0022)	07:24 16:01	14:51 (B0018) 15:25 (B0019)	08:26 15:15	14:00 (B0020)	14:13 (B0020)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	17:33 (B0017) 17:44 (B0017)	07:27 15:59	14:51 (B0018) 15:22 (B0019)	08:27 15:15	13:59 (B0020)	14:13 (B0020)
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:44 (B0017)	07:29 15:57	14:53 (B0018) 15:20 (B0019)	08:29 15:14	14:00 (B0020)	14:14 (B0020)
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12		07:31 15:55	14:53 (B0018) 15:17 (B0019)	08:30 15:14	14:00 (B0020)	14:15 (B0020)
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09		07:33 15:53	14:55 (B0018) 15:15 (B0019)	08:32 15:13	14:00 (B0020)	14:15 (B0020)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06		07:36 15:51	14:56 (B0018) 15:12 (B0019)	08:33 15:13	14:00 (B0020)	14:16 (B0020)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	17:06 (B0025)	07:38 15:49	14:58 (B0018) 15:10 (B0018)	08:34 15:13	14:01 (B0020)	14:17 (B0020)
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	17:02 (B0025)	07:40 15:47	15:03 (B0018)	08:35 15:12	14:01 (B0020)	14:17 (B0020)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	17:11 (B0025)	07:43 15:45	15:07 (B0018)	08:36 15:12	14:02 (B0020)	14:17 (B0020)
16	04:23 21:48	05:24 20:43	06:30 19:18	07:34 17:55	17:13 (B0025)	07:45 15:43		08:37 15:12	14:02 (B0020)	14:18 (B0020)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:59 (B0025)	07:47 15:41		08:38 15:12	14:02 (B0020)	14:18 (B0020)
18	04:26 21:44	05:28 20:38	06:34 19:13	07:39 17:50	17:14 (B0025)	07:49 15:39		08:39 15:13	14:03 (B0020)	14:19 (B0020)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:57 (B0025)	07:51 15:38		08:40 15:13	14:04 (B0020)	14:20 (B0020)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:58 (B0025)	07:54 15:36		08:41 15:13	14:03 (B0020)	14:19 (B0020)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	16:57 (B0025)	07:56 15:34		08:41 15:13	14:04 (B0020)	14:20 (B0020)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	17:09 (B0025)	07:58 15:33		08:42 15:14	14:04 (B0020)	14:20 (B0020)
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	17:06 (B0025)	08:00 15:31		08:42 15:14	14:05 (B0020)	14:21 (B0020)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 18:05 (B0012)	17:04 (B0025)	08:02 15:30		08:43 15:15	14:06 (B0020)	14:22 (B0020)
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 18:06 (B0012)	16:11 (B0018)	08:04 15:28		08:43 15:16	14:06 (B0020)	14:22 (B0020)
26	04:41 21:30	05:45 20:16	06:51 18:50	07:56 18:07 (B0012)	15:13 (B0018)	08:06 15:27		08:43 15:16	14:06 (B0020)	14:22 (B0020)
27	04:42 21:28	05:47 20:14	06:53 18:48	07:58 18:07 (B0012)	14:54 (B0018)	08:08 15:25		08:43 15:17	14:07 (B0020)	14:23 (B0020)
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 18:07 (B0012)	14:51 (B0018)	08:10 15:24		08:44 15:18	14:07 (B0020)	14:23 (B0020)
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 18:07 (B0012)	14:51 (B0018)	08:12 15:23		08:44 15:19	14:08 (B0020)	14:24 (B0020)
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 18:06 (B0012)	14:50 (B0018)	08:14 15:22		08:44 15:20	14:09 (B0020)	14:25 (B0020)
31	04:50 21:20	05:56 20:03		07:08 16:18	14:50 (B0018)			08:43 15:21	14:09 (B0020)	14:24 (B0020)
Potential sun hours	538	474	386	321		241		207		
Total, worst case			239	517		408		437		
Sun reduction			0,31	0,26		0,17		0,13		
Oper. time red.			0,99	0,99		0,99		0,99		
Wind dir. red.			0,66	0,68		0,69		0,70		
Total reduction			0,20	0,17		0,12		0,09		
Total, real			49	90		48		40		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (831)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

January			February			March			April	May	June
1	08:43	14:11 (B0020)	08:04	15:15 (B0018)	06:56	16:47 (B0017)	06:31	05:11	04:10		
	15:23	14	14:25 (B0020)	16:23	32	15:47 (B0019)	17:29	12	16:59 (B0017)	19:38	20:44
2	08:43	14:11 (B0020)	08:02	15:16 (B0018)	06:54	16:44 (B0017)	06:28	05:08	04:09		
	15:24	14	14:25 (B0020)	16:26	34	15:50 (B0019)	17:31	17	17:01 (B0017)	19:40	20:46
3	08:42	14:13 (B0020)	08:00	15:16 (B0018)	06:51	16:43 (B0017)	06:25	05:06	04:08		
	15:25	13	14:26 (B0020)	16:28	35	15:51 (B0019)	17:34	19	17:02 (B0017)	19:43	20:49
4	08:42	14:13 (B0020)	07:58	15:15 (B0018)	06:48	16:41 (B0017)	06:22	05:04	04:07		
	15:27	13	14:26 (B0020)	16:30	36	15:51 (B0019)	17:36	25	17:06 (B0022)	19:45	20:51
5	08:41	14:14 (B0020)	07:55	15:16 (B0018)	06:46	16:41 (B0017)	06:20	05:01	04:06		
	15:28	11	14:25 (B0020)	16:33	35	15:51 (B0019)	17:38	28	17:09 (B0022)	19:47	20:53
6	08:41	14:15 (B0020)	07:53	15:15 (B0018)	06:43	16:41 (B0017)	06:17	04:59	04:05		
	15:30	10	14:25 (B0020)	16:35	35	15:50 (B0019)	17:40	30	17:11 (B0012)	19:49	20:55
7	08:40	14:16 (B0020)	07:51	15:16 (B0018)	06:40	16:40 (B0017)	06:14	04:57	04:04		
	15:31	9	14:25 (B0020)	16:37	34	15:50 (B0019)	17:43	33	17:13 (B0012)	19:51	20:57
8	08:39	14:18 (B0020)	07:49	15:16 (B0018)	06:37	16:40 (B0017)	06:11	04:54	04:03		
	15:33	7	14:25 (B0020)	16:40	32	15:48 (B0019)	17:45	35	17:15 (B0012)	19:54	21:00
9	08:39	14:20 (B0020)	07:46	15:17 (B0018)	06:35	16:40 (B0017)	06:09	04:52	04:02		
	15:35	4	14:24 (B0020)	16:42	27	15:45 (B0019)	17:47	37	17:17 (B0012)	19:56	21:02
10	08:38		07:44	15:18 (B0018)	06:32	16:41 (B0017)	06:06	04:50	04:01		
	15:37		16:45	22	15:40 (B0018)	17:49	38	17:19 (B0012)	19:58	21:04	21:57
11	08:37		07:42	15:19 (B0018)	06:29	16:41 (B0017)	06:03	04:48	04:01		
	15:38		16:47	21	15:40 (B0018)	17:52	36	17:18 (B0012)	20:00	21:06	21:58
12	08:36		07:39	15:20 (B0018)	06:27	16:42 (B0017)	06:00	04:45	04:00		
	15:40		16:49	18	15:38 (B0018)	17:54	35	17:18 (B0012)	20:02	21:08	21:59
13	08:35		07:37	15:23 (B0018)	06:24	16:43 (B0017)	05:58	04:43	04:00		
	15:42		16:52	14	15:37 (B0018)	17:56	31	17:17 (B0012)	20:05	21:10	22:00
14	08:34		07:35	15:26 (B0018)	06:21	16:46 (B0017)	05:55	04:41	03:59		
	15:44		16:54	8	15:34 (B0018)	17:58	23	17:16 (B0012)	20:07	21:12	22:01
15	08:32		07:32		06:18	17:03 (B0012)	05:52	04:39	03:59		
	15:46		16:56		18:01	17:14 (B0012)	20:09	21:14	22:01		
16	08:31		07:30	16:23 (B0025)	06:15	17:06 (B0012)	05:50	04:37	03:59		
	15:48		16:59	3	16:26 (B0025)	18:03	6	17:12 (B0012)	20:11	21:16	22:02
17	08:30		07:27	16:22 (B0025)	06:13		05:47	04:35	03:58		
	15:50		17:01	7	16:29 (B0025)	18:05		20:13	21:18	22:02	
18	08:28		07:25	16:21 (B0025)	06:10		05:44	04:33	03:58		
	15:52		17:03	11	16:32 (B0025)	18:07		20:16	21:20	22:03	
19	08:27		07:22	16:21 (B0025)	06:07		05:42	04:31	03:58		
	15:54		17:06	13	16:34 (B0025)	18:10		20:18	21:22	22:03	
20	08:25		07:20	16:20 (B0025)	06:04		05:39	04:29	03:58		
	15:56		17:08	16	16:36 (B0025)	18:12		20:20	21:24	22:04	
21	08:24		07:17	16:21 (B0025)	06:01		05:36	04:27	03:58		
	15:58		17:11	16	16:37 (B0025)	18:14		20:22	21:26	22:04	
22	08:22		07:15	16:21 (B0025)	05:59		05:34	04:26	03:59		
	16:01		17:13	15	16:36 (B0025)	18:16		20:24	21:28	22:04	
23	08:21		07:12	16:21 (B0025)	05:56		05:31	04:24	03:59		
	16:03		17:15	14	16:35 (B0025)	18:18		20:27	21:30	22:04	
24	08:19		07:10	16:22 (B0025)	05:53		05:28	04:22	03:59		
	16:05		17:18	11	16:33 (B0025)	18:21		20:29	21:32	22:04	
25	08:17	15:23 (B0018)	07:07	16:25 (B0025)	05:50		05:26	04:20	04:00		
	16:07	6	15:29 (B0018)	17:20	7	16:32 (B0025)		20:31	21:34	22:04	
26	08:15	15:21 (B0018)	07:04		05:48		05:23	04:19	04:00		
	16:09	10	15:31 (B0018)	17:22	18:25		20:33	21:36	22:04		
27	08:14	15:18 (B0018)	07:02		05:45		05:21	04:17	04:01		
	16:12	15	15:33 (B0018)	17:24	18:27		20:35	21:37	22:04		
28	08:12	15:18 (B0018)	06:59	16:50 (B0017)	05:42		05:18	04:16	04:01		
	16:14	18	15:36 (B0019)	17:27	5	16:55 (B0017)	18:29	20:38	21:39	22:04	
29	08:10	15:17 (B0018)			06:39		05:16	04:14	04:02		
	16:16	22	15:39 (B0019)		19:32		20:40	21:41	22:04		
30	08:08	15:17 (B0018)			06:36		05:13	04:13	04:03		
	16:19	25	15:42 (B0019)		19:34		20:42	21:42	22:03		
31	08:06	15:16 (B0018)			06:34			04:11			
	16:21	29	15:45 (B0019)		19:36			21:44			
Potential sun hours	228		262		366		429	515	539		
Total, worst case	220		501		416						
Sun reduction	0,19		0,16		0,22						
Oper. time red.	0,99		0,99		0,99						
Wind dir. red.	0,69		0,69		0,67						
Total reduction	0,13		0,11		0,15						
Total, real	28		55		61						

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (831)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December			
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	17:22 (B0017) 17:57 (B0012)	07:11 16:15	14:47 (B0018) 15:10 (B0018)	08:16 15:21	
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	17:20 (B0017) 17:56 (B0012)	07:13 16:13	14:47 (B0018) 15:16 (B0019)	08:18 15:20	
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:18 (B0017) 17:56 (B0012)	07:15 16:10	14:46 (B0018) 15:18 (B0019)	08:19 15:19	14:03 (B0020)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:18 (B0017) 17:56 (B0012)	07:17 16:08	14:46 (B0018) 15:19 (B0019)	08:21 15:18	14:02 (B0020)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:17 (B0017) 17:54 (B0012)	07:20 16:06	14:45 (B0018) 15:20 (B0019)	08:23 15:17	14:09 (B0020)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:16 (B0017) 17:51 (B0012)	07:22 16:04	14:45 (B0018) 15:21 (B0019)	08:24 15:16	14:01 (B0020)
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:16 (B0017) 17:48 (B0012)	07:24 16:01	14:46 (B0018) 15:22 (B0019)	08:26 15:15	14:01 (B0020)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	17:17 (B0017) 17:45 (B0022)	07:27 15:59	14:46 (B0018) 15:21 (B0019)	08:27 15:15	14:01 (B0020)
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:16 (B0017) 17:42 (B0022)	07:29 15:57	14:46 (B0018) 15:20 (B0019)	08:29 15:14	14:01 (B0020)
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	17:17 (B0017) 17:39 (B0022)	07:31 15:55	14:46 (B0018) 15:17 (B0019)	08:30 15:14	14:02 (B0020)
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	17:17 (B0017) 17:35 (B0017)	07:33 15:53	14:47 (B0018) 15:15 (B0019)	08:32 15:13	14:01 (B0020)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	17:19 (B0017) 17:34 (B0017)	07:36 15:51	14:48 (B0018) 15:12 (B0019)	08:33 15:13	14:01 (B0020)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	17:21 (B0017) 17:31 (B0017)	07:38 15:49	14:49 (B0018) 15:11 (B0019)	08:34 15:13	14:02 (B0020)
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	17:30 18:01	07:40 15:47	14:51 (B0018) 15:09 (B0019)	08:35 15:12	14:02 (B0020)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	17:32 17:58	07:43 15:45	14:51 (B0018) 15:06 (B0018)	08:36 15:12	14:02 (B0020)
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	17:34 17:55	07:45 15:43	14:54 (B0018) 15:04 (B0018)	08:37 15:12	14:03 (B0020)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:55 (B0025) 17:04 (B0025)	07:47 15:41	14:56 (B0018) 15:02 (B0018)	08:38 15:12	14:03 (B0020)
18	04:26 21:44	05:28 20:38	06:34 19:13	07:39 17:50	16:54 (B0025) 17:06 (B0025)	07:49 15:39	15:02 (B0018)	08:39 15:12	14:04 (B0020)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:52 (B0025) 17:06 (B0025)	07:51 15:38	15:12 (B0018)	08:40 15:13	14:04 (B0020)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:52 (B0025) 17:07 (B0025)	07:54 15:36	15:13 (B0018)	08:41 15:13	14:04 (B0020)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	16:51 (B0025) 17:07 (B0025)	07:56 15:34	15:14 (B0018)	08:41 15:13	14:05 (B0020)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:50 (B0025) 17:06 (B0025)	07:58 15:33	15:14 (B0018)	08:42 15:14	14:06 (B0020)
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:51 (B0025) 17:04 (B0025)	08:00 15:31	15:15 (B0018)	08:42 15:14	14:06 (B0020)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:51 (B0025) 17:00 (B0025)	08:02 15:30	15:16 (B0018)	08:43 15:15	14:06 (B0020)
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 16:32	15:52 (B0025) 15:58 (B0025)	08:04 15:28	15:17 (B0018)	08:43 15:16	14:07 (B0020)
26	04:40 21:30	05:45 20:16	06:51 18:50	07:57 16:30	15:53 (B0025) 15:55 (B0025)	08:06 15:27	15:18 (B0018)	08:43 15:16	14:07 (B0020)
27	04:42 21:28	05:47 20:14	06:53 18:48	07:59 16:27	15:55 (B0025) 17:51 (B0012)	15:27 15:25	15:19 (B0018)	08:43 15:17	14:08 (B0020)
28	04:44 21:26	05:50 20:11	06:55 18:45	08:01 16:25	17:45 (B0012) 17:54 (B0012)	08:10 15:24	15:18 (B0018)	08:44 15:18	14:08 (B0020)
29	04:46 21:24	05:52 20:08	06:57 18:42	08:02 16:22	14:52 (B0018) 15:07 (B0018)	08:12 15:23	15:19 (B0018)	08:44 15:19	14:09 (B0020)
30	04:48 21:22	05:54 20:06	06:59 18:39	08:04 16:20	17:24 (B0017) 15:08 (B0018)	08:14 15:22	15:20 (B0018)	08:44 15:20	14:10 (B0020)
31	04:50 21:20	05:56 20:03		08:06 16:17	14:49 (B0018) 15:09 (B0018)	15:22	15:21 (B0018)	08:43 15:21	14:10 (B0020)
Potential sun hours	538	474	386	321	241	207			
Total, worst case			58	541	447	387			
Sun reduction			0,31	0,26	0,17	0,13			
Oper. time red.			0,99	0,99	0,99	0,99			
Wind dir. red.			0,66	0,67	0,69	0,70			
Total reduction			0,20	0,17	0,12	0,09			
Total, real			12	93	52	35			

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (843)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	08:43		14:13 (B0020)	08:04		15:19 (B0018)	06:56		16:52 (B0017)	06:31	05:11	04:10
	15:23	14	14:27 (B0020)	16:23	28	15:47 (B0019)	17:29	7	16:59 (B0017)	19:38	20:44	21:45
2	08:43		14:13 (B0020)	08:02		15:19 (B0018)	06:54		16:48 (B0017)	06:28	05:08	04:09
	15:24	14	14:27 (B0020)	16:26	31	15:50 (B0019)	17:31	13	17:01 (B0017)	19:40	20:46	21:47
3	08:42		14:14 (B0020)	08:00		15:19 (B0018)	06:51		16:46 (B0017)	06:25	05:06	04:08
	15:25	14	14:28 (B0020)	16:28	34	15:53 (B0019)	17:34	17	17:03 (B0017)	19:43	20:49	21:48
4	08:42		14:15 (B0020)	07:58		15:19 (B0018)	06:48		16:45 (B0017)	06:22	05:04	04:07
	15:27	13	14:28 (B0020)	16:30	34	15:53 (B0019)	17:36	19	17:04 (B0017)	19:45	20:51	21:50
5	08:41		14:15 (B0020)	07:55		15:19 (B0018)	06:46		16:44 (B0017)	06:20	05:01	04:06
	15:28	13	14:28 (B0020)	16:33	34	15:53 (B0019)	17:38	21	17:05 (B0017)	19:47	20:53	21:51
6	08:41		14:16 (B0020)	07:53		15:19 (B0018)	06:43		16:43 (B0017)	06:17	04:59	04:05
	15:30	12	14:28 (B0020)	16:35	33	15:52 (B0019)	17:40	23	17:06 (B0017)	19:49	20:55	21:52
7	08:40		14:17 (B0020)	07:51		15:19 (B0018)	06:40		16:43 (B0017)	06:14	04:57	04:04
	15:31	11	14:28 (B0020)	16:37	33	15:52 (B0019)	17:43	28	17:13 (B0012)	19:51	20:57	21:54
8	08:39		14:18 (B0020)	07:49		15:19 (B0018)	06:37		16:42 (B0017)	06:11	04:54	04:03
	15:33	10	14:28 (B0020)	16:40	32	15:51 (B0019)	17:45	32	17:15 (B0012)	19:54	21:00	21:55
9	08:39		14:20 (B0020)	07:46		15:20 (B0018)	06:35		16:42 (B0017)	06:09	04:52	04:02
	15:35	7	14:27 (B0020)	16:42	30	15:50 (B0019)	17:47	35	17:17 (B0012)	19:56	21:02	21:56
10	08:38		14:21 (B0020)	07:44		15:20 (B0018)	06:32		16:43 (B0017)	06:06	04:50	04:01
	15:37	5	14:26 (B0020)	16:45	24	15:44 (B0018)	17:49	37	17:20 (B0012)	19:58	21:04	21:57
11	08:37			07:42		15:21 (B0018)	06:29		16:43 (B0017)	06:03	04:48	04:01
	15:38			16:47	23	15:44 (B0018)	17:52	37	17:20 (B0012)	20:00	21:06	21:58
12	08:36			07:39		15:22 (B0018)	06:27		16:43 (B0017)	06:00	04:45	04:00
	15:40			16:49	21	15:43 (B0018)	17:54	36	17:19 (B0012)	20:02	21:08	21:59
13	08:35			07:37		15:24 (B0018)	06:24		16:44 (B0017)	05:58	04:43	04:00
	15:42			16:52	18	15:42 (B0018)	17:56	33	17:19 (B0012)	20:05	21:10	22:00
14	08:34			07:35		15:26 (B0018)	06:21		16:46 (B0017)	05:55	04:41	03:59
	15:44			16:54	14	15:40 (B0018)	17:58	28	17:18 (B0012)	20:07	21:12	22:01
15	08:32			07:32		15:28 (B0018)	06:18		16:49 (B0017)	05:52	04:39	03:59
	15:46			16:56	9	15:37 (B0018)	18:01	20	17:16 (B0012)	20:09	21:14	22:01
16	08:31			07:30			06:15		17:06 (B0012)	05:50	04:37	03:59
	15:48			16:59			18:03	9	17:15 (B0012)	20:11	21:16	22:02
17	08:30			07:27		16:24 (B0025)	06:13			05:47	04:35	03:58
	15:50			17:01	5	16:29 (B0025)	18:05			20:13	21:18	22:02
18	08:28			07:25		16:24 (B0025)	06:10			05:44	04:33	03:58
	15:52			17:03	8	16:32 (B0025)	18:07			20:16	21:20	22:03
19	08:27			07:22		16:23 (B0025)	06:07			05:42	04:31	03:58
	15:54			17:06	11	16:34 (B0025)	18:10			20:18	21:22	22:03
20	08:25			07:20		16:22 (B0025)	06:04			05:39	04:29	03:58
	15:56			17:08	14	16:36 (B0025)	18:12			20:20	21:24	22:04
21	08:24			07:17		16:22 (B0025)	06:01			05:36	04:27	03:58
	15:58			17:11	16	16:38 (B0025)	18:14			20:22	21:26	22:04
22	08:22			07:15		16:22 (B0025)	05:59			05:34	04:26	03:59
	16:01			17:13	16	16:38 (B0025)	18:16			20:24	21:28	22:04
23	08:21			07:12		16:22 (B0025)	05:56			05:31	04:24	03:59
	16:03			17:15	15	16:37 (B0025)	18:18			20:27	21:30	22:04
24	08:19			07:10		16:23 (B0025)	05:53			05:28	04:22	03:59
	16:05			17:18	13	16:36 (B0025)	18:21			20:29	21:32	22:04
25	08:17			07:07		16:25 (B0025)	05:50			05:26	04:20	04:00
	16:07			17:20	10	16:35 (B0025)	18:23			20:31	21:34	22:04
26	08:15			07:04		16:28 (B0025)	05:48			05:23	04:19	04:00
	16:09			17:22	4	16:32 (B0025)	18:25			20:33	21:36	22:04
27	08:14		15:24 (B0018)	07:02			05:45			05:21	04:17	04:01
	16:12	9	15:33 (B0018)	17:24			18:27			20:35	21:37	22:04
28	08:12		15:23 (B0018)	06:59			05:42			05:18	04:16	04:01
	16:14	13	15:36 (B0018)	17:27			18:29			20:38	21:39	22:04
29	08:10		15:22 (B0018)				06:39			05:16	04:14	04:02
	16:16	17	15:39 (B0019)				19:32			20:40	21:41	22:04
30	08:08		15:21 (B0018)				06:36			05:13	04:13	04:03
	16:19	21	15:42 (B0019)				19:34			20:42	21:42	22:03
31	08:06		15:21 (B0018)				06:34				04:11	
	16:21	24	15:45 (B0019)				19:36				21:44	
Potential sun hours	228			262			366		429	515		539
Total, worst case		197			510			395				
Sun reduction		0,19			0,16			0,22				
Oper. time red.		0,99			0,99			0,99				
Wind dir. red.		0,69			0,69			0,66				
Total reduction		0,13			0,11			0,15				
Total, real		25			56			58				

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (843)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	17:23 (B0017) 16:15	14:49 (B0018) 15:21
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	17:21 (B0017) 16:13	14:49 (B0018) 15:20
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:20 (B0017) 16:10	14:48 (B0018) 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:20 (B0017) 16:08	14:49 (B0018) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:19 (B0017) 16:06	14:48 (B0018) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:19 (B0017) 16:04	14:49 (B0018) 15:16
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:18 (B0017) 16:01	14:49 (B0018) 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	17:19 (B0017) 15:59	14:49 (B0018) 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:19 (B0017) 15:57	14:50 (B0018) 15:14
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	17:20 (B0017) 15:55	14:50 (B0018) 15:14
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	17:21 (B0017) 15:53	14:52 (B0018) 15:13
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	17:23 (B0017) 15:51	14:52 (B0018) 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	17:34 (B0017) 15:49	14:54 (B0018) 15:13
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	17:05 (B0025) 15:47	14:56 (B0018) 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	17:09 (B0025) 15:45	14:57 (B0018) 15:12
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	16:58 (B0025) 15:43	14:58 (B0018) 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:55 (B0025) 15:41	14:59 (B0018) 15:12
18	04:26 21:44	05:28 20:38	06:34 19:13	07:39 17:50	16:55 (B0025) 15:39	14:59 (B0018) 15:12
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:53 (B0025) 15:38	14:59 (B0018) 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:53 (B0025) 15:36	14:59 (B0018) 15:13
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	16:53 (B0025) 15:34	14:59 (B0018) 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:52 (B0025) 15:33	14:59 (B0018) 15:14
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:53 (B0025) 15:31	14:59 (B0018) 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:53 (B0025) 15:30	14:59 (B0018) 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 16:32	15:55 (B0025) 15:28	14:59 (B0018) 15:16
26	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	15:58 (B0025) 15:27	14:59 (B0018) 15:16
27	04:42 21:28	05:47 20:14	06:53 18:48	06:59 16:27	14:58 (B0018) 15:25	14:59 (B0018) 15:17
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	14:54 (B0018) 15:24	14:59 (B0018) 15:18
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	14:53 (B0018) 15:23	14:59 (B0018) 15:19
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	14:51 (B0018) 15:22	14:59 (B0018) 15:20
31	04:50 21:20	05:56 20:03		07:08 16:17	14:51 (B0018) 15:14	14:59 (B0018) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case			75	526	399	408
Sun reduction			0,31	0,26	0,17	0,13
Oper. time red.			0,99	0,99	0,99	0,99
Wind dir. red.			0,66	0,67	0,69	0,70
Total reduction			0,20	0,17	0,12	0,09
Total, real			15	91	47	37

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (918)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	14:49 (B0018) 15:29 (B0019)	06:56 17:29	16:18 (B0017) 19:38	05:11 20:44
2	08:43 15:24	08:02 16:26	14:51 (B0018) 15:27 (B0019)	06:54 17:31	16:19 (B0017) 19:40	05:08 20:46
3	08:42 15:25	08:00 16:28	14:53 (B0018) 15:08 (B0018)	06:51 17:34	16:19 (B0017) 19:43	05:06 20:49
4	08:42 15:27	07:58 16:30	14:55 (B0018) 15:05 (B0018)	06:48 17:36	16:20 (B0017) 19:45	05:04 20:51
5	08:41 15:28	07:55 16:33	15:05 (B0018) 17:38	17:36 33	16:22 (B0017) 19:47	05:01 20:53
6	08:41 15:30	07:53 16:35	16:43 17:40	30	16:24 (B0017) 19:49	04:59 20:55
7	08:40 15:31	07:51 16:37	16:40 17:43	17	16:47 (B0012) 19:51	04:57 20:57
8	08:39 15:33	07:49 16:40	16:37 17:45	16	16:47 (B0012) 19:54	04:54 21:00
9	08:39 15:35	14:50 (B0018) 14:51 (B0018)	07:46 16:42	16:07 (B0025) 16:08 (B0025)	06:35 17:47	16:48 (B0012) 19:56
10	08:38 15:37	14:47 (B0018) 14:52 (B0018)	07:44 16:45	16:05 (B0025) 16:10 (B0025)	17:47 17:50	17:02 (B0012) 19:58
11	08:37 15:38	14:46 (B0018) 14:55 (B0018)	07:42 16:47	16:05 (B0025) 16:13 (B0025)	06:29 17:52	16:54 (B0012) 20:00
12	08:36 15:40	14:46 (B0018) 14:57 (B0018)	07:39 16:49	16:04 (B0025) 16:16 (B0025)	06:27 17:54	06:00 20:02
13	08:35 15:42	14:45 (B0018) 14:59 (B0018)	07:37 16:52	16:04 (B0025) 16:19 (B0025)	06:24 17:56	05:58 20:05
14	08:34 15:44	14:45 (B0018) 15:02 (B0018)	07:35 16:54	16:04 (B0025) 16:21 (B0025)	06:21 17:58	05:55 20:07
15	08:32 15:46	14:44 (B0018) 15:03 (B0018)	07:32 16:56	16:05 (B0025) 16:21 (B0025)	06:18 18:01	05:52 20:09
16	08:31 15:48	14:45 (B0018) 15:06 (B0018)	07:30 16:59	16:05 (B0025) 16:20 (B0025)	06:15 18:03	05:50 20:11
17	08:30 15:50	14:44 (B0018) 15:07 (B0018)	07:27 17:01	16:05 (B0025) 16:19 (B0025)	06:13 18:05	05:47 20:13
18	08:28 15:52	14:44 (B0018) 15:07 (B0018)	07:25 17:03	16:07 (B0025) 16:19 (B0025)	06:10 18:07	05:44 20:16
19	08:27 15:54	14:43 (B0018) 15:08 (B0018)	07:22 17:06	16:09 (B0025) 16:34 (B0017)	06:07 18:10	05:42 20:18
20	08:25 15:56	14:44 (B0018) 15:16 (B0019)	07:20 17:08	16:24 (B0017) 16:36 (B0017)	06:04 18:12	05:39 20:20
21	08:24 15:58	14:44 (B0018) 15:19 (B0019)	07:17 17:11	16:23 (B0017) 16:39 (B0017)	06:02 18:14	05:36 20:22
22	08:22 16:01	14:44 (B0018) 15:21 (B0019)	07:15 17:13	16:21 (B0017) 16:41 (B0017)	05:59 18:16	05:34 20:24
23	08:21 16:03	14:44 (B0018) 15:24 (B0019)	07:12 17:15	16:20 (B0017) 16:41 (B0017)	05:56 18:18	05:31 20:27
24	08:19 16:05	14:44 (B0018) 15:26 (B0019)	07:10 17:18	16:19 (B0017) 16:42 (B0017)	05:53 18:21	05:29 20:29
25	08:17 16:07	14:45 (B0018) 15:29 (B0019)	07:07 17:20	16:19 (B0017) 16:43 (B0017)	05:50 18:23	05:26 20:31
26	08:15 16:09	14:45 (B0018) 15:31 (B0019)	07:04 17:22	16:18 (B0017) 16:43 (B0017)	05:48 18:25	05:23 20:33
27	08:14 16:12	14:45 (B0018) 15:31 (B0019)	07:02 17:24	16:18 (B0017) 16:54 (B0022)	05:45 18:27	05:21 20:35
28	08:12 16:14	14:45 (B0018) 15:31 (B0019)	06:59 17:27	16:17 (B0017) 16:56 (B0012)	05:42 18:29	05:18 20:38
29	08:10 16:16	14:46 (B0018) 15:31 (B0019)	17:27 19:32	06:39 19:32	05:16 20:40	04:14 21:41
30	08:08 16:19	14:47 (B0018) 15:31 (B0019)	19:34 19:34	06:36 19:34	05:13 20:42	04:13 21:42
31	08:06 16:21	14:48 (B0018) 15:31 (B0019)	19:36 19:36	06:34 19:36	04:11 21:44	22:03
Potential sun hours	228	262	366	429	515	539
Total, worst case	622	405	262			
Sun reduction	0,19	0,16	0,22			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,69	0,68			
Total reduction	0,13	0,11	0,15			
Total, real	79	45	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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: DÖDRINGSHULT 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (918)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	15:35 (B0025) 15:39 (B0025)
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	07:13 16:13	15:21 15:20
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:29 (B0012) 17:37 (B0012)	15:20 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:27 (B0012) 17:39 (B0012)	15:19 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:25 (B0012) 17:40 (B0012)	15:21 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:24 (B0012) 17:40 (B0012)	14:30 (B0018) 14:31 (B0018)
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:01 (B0017) 17:40 (B0012)	14:25 (B0018) 14:36 (B0018)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	16:58 (B0017) 17:40 (B0012)	14:22 (B0018) 14:38 (B0018)
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	16:56 (B0017) 17:40 (B0012)	14:21 (B0018) 14:58 (B0019)
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	16:54 (B0017) 17:39 (B0012)	14:20 (B0018) 15:00 (B0019)
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	16:52 (B0017) 17:36 (B0012)	14:19 (B0018) 15:01 (B0019)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	16:52 (B0017) 17:34 (B0012)	14:18 (B0018) 15:02 (B0019)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	16:51 (B0017) 17:31 (B0012)	14:18 (B0018) 15:03 (B0019)
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	16:50 (B0017) 17:28 (B0022)	14:18 (B0018) 15:04 (B0019)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:51 (B0017) 17:16 (B0017)	14:18 (B0018) 15:04 (B0019)
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	16:50 (B0017) 17:15 (B0017)	14:18 (B0018) 15:04 (B0019)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:50 (B0017) 17:14 (B0017)	14:18 (B0018) 15:02 (B0019)
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	16:51 (B0017) 17:14 (B0017)	14:18 (B0018) 15:00 (B0019)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:51 (B0017) 17:12 (B0017)	14:18 (B0018) 14:58 (B0019)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:53 (B0017) 17:12 (B0017)	14:19 (B0018) 14:56 (B0019)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	16:54 (B0017) 17:09 (B0017)	14:19 (B0018) 14:54 (B0019)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:55 (B0017) 17:06 (B0017)	14:20 (B0018) 14:52 (B0019)
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:38 (B0025) 16:47 (B0025)	14:20 (B0018) 14:45 (B0018)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:36 (B0025) 16:48 (B0025)	14:21 (B0018) 14:44 (B0018)
25	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	15:35 (B0025) 15:50 (B0025)	14:22 (B0018) 14:45 (B0018)
26	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	15:34 (B0025) 15:50 (B0025)	14:23 (B0018) 14:44 (B0018)
27	04:42 21:28	05:47 20:14	06:53 18:48	06:59 16:27	15:34 (B0025) 15:50 (B0025)	14:23 (B0018) 14:43 (B0018)
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	15:33 (B0025) 15:50 (B0025)	14:25 (B0018) 14:42 (B0018)
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	15:34 (B0025) 15:48 (B0025)	14:26 (B0018) 14:40 (B0018)
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	15:34 (B0025) 15:45 (B0025)	14:27 (B0018) 14:38 (B0018)
31	04:50 21:20	05:56 20:03		07:08 16:17	15:35 (B0025) 15:42 (B0025)	14:38 (B0018) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case				591	698	34
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,68	0,69	0,69
Total reduction				0,17	0,12	0,09
Total, real				103	82	3

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: Grevekulla - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (806)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	08:43		14:08 (6)	08:04			06:56			06:31		18:36 (4)	05:11		19:36 (3)	04:10		19:40 (3)
	15:22	25	14:33 (6)	16:23			17:29			19:38	25	19:01 (4)	20:44	29	20:05 (3)	21:45	24	20:04 (3)
2	08:43		14:08 (6)	08:02			06:54			06:28		18:36 (4)	05:08		19:34 (3)	04:09		19:41 (3)
	15:24	25	14:33 (6)	16:25			17:31			19:40	25	19:01 (4)	20:46	32	20:06 (3)	21:47	22	20:03 (3)
3	08:42		14:09 (6)	08:00			06:51			06:25		18:35 (4)	05:06		19:33 (3)	04:07		19:42 (3)
	15:25	26	14:35 (6)	16:28			17:33			19:42	26	19:01 (4)	20:49	34	20:07 (3)	21:48	20	20:02 (3)
4	08:42		14:09 (6)	07:57			06:48			06:22		18:35 (4)	05:03		19:33 (3)	04:06		19:43 (3)
	15:27	26	14:35 (6)	16:30			17:36			19:45	25	19:00 (4)	20:51	36	20:17 (2)	21:50	19	20:02 (3)
5	08:41		14:09 (6)	07:55			06:45			06:19		18:35 (4)	05:01		19:32 (3)	04:05		19:45 (3)
	15:28	26	14:35 (6)	16:32			17:38			19:47	26	19:17 (1)	20:53	40	20:19 (2)	21:51	17	20:02 (3)
6	08:41		14:09 (6)	07:53			06:43			06:17		18:35 (4)	04:59		19:32 (3)	04:04		19:46 (3)
	15:30	27	14:36 (6)	16:35			17:40			19:49	29	19:19 (1)	20:55	45	20:21 (2)	21:52	14	20:00 (3)
7	08:40		14:09 (6)	07:51			06:40			06:14		18:36 (4)	04:56		19:30 (3)	04:03		19:47 (3)
	15:31	28	14:37 (6)	16:37			17:43			19:51	30	19:21 (1)	20:57	49	20:22 (2)	21:54	12	19:59 (3)
8	08:39		14:10 (6)	07:49			06:37			06:11		18:36 (4)	04:54		19:30 (3)	04:03		19:49 (3)
	15:33	27	14:37 (6)	16:40			17:45			19:53	31	19:23 (1)	20:59	52	20:24 (2)	21:55	10	19:59 (3)
9	08:39		14:10 (6)	07:46			06:35			06:08		18:38 (4)	04:52		19:30 (3)	04:02		19:51 (3)
	15:34	28	14:38 (6)	16:42			17:47			19:56	31	19:26 (1)	21:02	54	20:26 (2)	21:56	5	19:56 (3)
10	08:38		14:10 (6)	07:44			06:32			06:06		18:40 (4)	04:49		19:30 (3)	04:01		
	15:36	28	14:38 (6)	16:44			17:49			19:58	29	19:27 (1)	21:04	57	20:28 (2)	21:57		
11	08:37		14:10 (6)	07:42			06:29			06:03		18:43 (4)	04:47		19:29 (3)	04:00		
	15:38	29	14:39 (6)	16:47			17:52			20:00	24	19:29 (1)	21:06	61	20:30 (2)	21:58		
12	08:36		14:11 (6)	07:39		16:13 (5)	06:26			06:00		19:12 (1)	04:45		19:29 (3)	04:00		
	15:40	28	14:39 (6)	16:49	2	16:15 (5)	17:54			20:02	18	19:30 (1)	21:08	63	20:32 (2)	21:59		
13	08:35		14:11 (6)	07:37		16:11 (5)	06:24			05:57		19:12 (1)	04:43		19:29 (3)	03:59		
	15:42	28	14:39 (6)	16:51	8	16:19 (5)	17:56			20:04	16	19:28 (1)	21:10	63	20:32 (2)	22:00		
14	08:33		14:12 (6)	07:35		16:10 (5)	06:21			05:55		19:13 (1)	04:41		19:30 (3)	03:59		
	15:44	28	14:40 (6)	16:54	11	16:21 (5)	17:58			20:07	13	19:26 (1)	21:12	62	20:33 (2)	22:01		
15	08:32		14:12 (6)	07:32		16:08 (5)	06:18			05:52		19:16 (1)	04:39		19:30 (3)	03:59		
	15:46	28	14:40 (6)	16:56	15	16:23 (5)	18:00			20:09	9	19:25 (1)	21:14	61	20:32 (2)	22:01		
16	08:31		14:13 (6)	07:30		16:08 (5)	06:15			05:49			04:37		19:30 (3)	03:58		
	15:48	28	14:41 (6)	16:59	18	16:26 (5)	18:03			20:11			21:16	61	20:32 (2)	22:02		
17	08:30		14:13 (6)	07:27		16:07 (5)	06:12			05:47			04:35		19:30 (3)	03:58		
	15:50	28	14:41 (6)	17:01	21	16:28 (5)	18:05			20:13			21:18	59	20:31 (2)	22:02		
18	08:28		14:14 (6)	07:25		16:07 (5)	06:10			05:44			04:33		19:30 (3)	03:58		
	15:52	27	14:41 (6)	17:03	23	16:30 (5)	18:07			20:15			21:20	57	20:30 (2)	22:03		
19	08:27		14:14 (6)	07:22		16:07 (5)	06:07			05:41			04:31		19:31 (3)	03:58		
	15:54	26	14:40 (6)	17:06	23	16:30 (5)	18:09			20:18			21:22	57	20:31 (2)	22:03		
20	08:25		14:16 (6)	07:20		16:07 (5)	06:04			05:39			04:29		19:31 (3)	03:58		
	15:56	25	14:41 (6)	17:08	23	16:30 (5)	18:12			20:20			21:24	54	20:29 (2)	22:04		
21	08:24		14:16 (6)	07:17		16:07 (5)	06:01			05:36			04:27		19:32 (3)	03:58		
	15:58	25	14:41 (6)	17:10	22	16:29 (5)	18:14			20:22			21:26	51	20:29 (2)	22:04		
22	08:22		14:17 (6)	07:15		16:08 (5)	05:59			05:33			04:25		19:32 (3)	03:58		
	16:00	24	14:41 (6)	17:13	21	16:29 (5)	18:16			20:24			21:28	48	20:28 (2)	22:04		
23	08:21		14:18 (6)	07:12		16:09 (5)	05:56			05:31			04:23		19:33 (3)	03:58		
	16:02	22	14:40 (6)	17:15	19	16:28 (5)	18:18			20:27			21:30	45	20:27 (2)	22:04		
24	08:19		14:20 (6)	07:09		16:09 (5)	05:53			05:28			04:22		19:33 (3)	03:59		
	16:05	20	14:40 (6)	17:17	18	16:27 (5)	18:20			20:29			21:32	37	20:23 (2)	22:04		
25	08:17		14:21 (6)	07:07		16:12 (5)	05:50			05:26			04:20		19:34 (3)	03:59		
	16:07	18	14:39 (6)	17:20	14	16:26 (5)	18:23			20:31			21:34	34	20:08 (3)	22:04		
26	08:15		14:23 (6)	07:04		16:14 (5)	05:47		17:47 (4)	05:23			04:18		19:34 (3)	04:00		
	16:09	15	14:38 (6)	17:22	9	16:23 (5)	18:25	6	17:53 (4)	20:33			21:35	33	20:07 (3)	22:04		
27	08:14		14:25 (6)	07:02			05:45		17:44 (4)	05:21		19:44 (3)	04:17		19:36 (3)	04:00		
	16:11	10	14:35 (6)	17:24			18:27	13	17:57 (4)	20:35	13	19:57 (3)	21:37	31	20:07 (3)	22:04		
28	08:12			06:59			05:42		17:41 (4)	05:18		19:42 (3)	04:15		19:37 (3)	04:01		
	16:14			17:27			18:29	18	17:59 (4)	20:38	18	20:00 (3)	21:39	29	20:06 (3)	22:04		
29	08:10						06:39		18:39 (4)	05:16		19:39 (3)	04:14		19:38 (3)	04:01		
	16:16						19:31	21	19:00 (4)	20:40	23	20:02 (3)	21:41	28	20:06 (3)	22:04		
30	08:08						06:36		18:38 (4)	05:13		19:37 (3)	04:12		19:38 (3)	04:02		
	16:18						19:34	22	19:00 (4)	20:42	27	20:04 (3)	21:42	27	20:05 (3)	22:03		
31	08:06						06:33		18:36 (4)				04:11		19:39 (3)			
	16:21						19:36	25	19:01 (4)				21:44	25	20:04 (3)			
Potential sun hours	227			262			366			429			515			539		
Total, worst case		675			247		105			438			1414				143	
Sun reduction		0,19			0,16		0,22			0,42			0,53				0,43	
Oper. time red.		0,99			0,99		0,99			0,99			0,99				0,99	
Wind dir. red.		0,70			0,69		0,65			0,63			0,60				0,60	
Total reduction		0,13			0,11		0,15			0,27			0,32				0,26	
Total, real		88			28		15			119			455				37	

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: Grevekulla - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	19:40 (3) 20:42 (2)	05:58 20:00	18:43 (4) 19:29 (1)	07:01 18:36
2	04:04 22:02	04:54 21:16	19:40 (3) 20:39 (2)	06:00 19:57	18:39 (4) 19:26 (1)	07:03 18:33
3	04:05 22:02	19:57 (3) 04:56	21:14 19:40 (3)	06:02 19:55	18:36 (4) 19:24 (1)	07:06 18:31
4	04:06 22:01	19:55 (3) 20:03 (3)	04:58 21:11	06:04 20:36 (2)	18:34 (4) 19:21 (1)	07:08 18:28
5	04:07 22:00	19:54 (3) 20:05 (3)	05:00 21:09	06:06 20:34 (2)	18:33 (4) 19:18 (1)	07:10 18:25
6	04:08 21:59	19:53 (3) 20:06 (3)	05:02 21:07	06:08 19:41 (3)	18:32 (4) 19:15 (1)	07:12 18:22
7	04:09 21:58	19:52 (3) 20:08 (3)	05:05 21:04	06:11 20:30 (2)	18:31 (4) 19:13 (1)	07:14 18:20
8	04:10 21:57	19:51 (3) 20:09 (3)	05:07 21:02	06:13 19:41	18:30 (4) 18:55 (4)	07:16 18:17
9	04:12 21:56	19:50 (3) 20:09 (3)	05:09 21:00	06:15 19:42 (3)	18:29 (4) 18:55 (4)	07:19 18:14
10	04:13 21:55	19:49 (3) 20:10 (3)	05:11 20:57	06:17 19:35	18:29 (4) 18:55 (4)	07:21 18:11
11	04:14 21:54	19:49 (3) 20:12 (3)	05:13 20:55	06:19 19:32	18:29 (4) 18:54 (4)	07:23 18:09
12	04:16 21:53	19:48 (3) 20:12 (3)	05:15 20:52	06:21 19:30	18:29 (4) 18:53 (4)	07:25 18:06
13	04:17 21:52	19:47 (3) 20:13 (3)	05:17 20:50	06:23 19:27	18:29 (4) 18:52 (4)	07:27 18:03
14	04:19 21:50	19:47 (3) 20:14 (3)	05:19 20:48	06:25 19:24	18:29 (4) 18:50 (4)	07:30 18:01
15	04:20 21:49	19:46 (3) 20:15 (3)	05:22 20:45	06:27 19:21	18:30 (4) 18:49 (4)	07:32 17:58
16	04:22 21:48	19:45 (3) 20:15 (3)	05:24 20:43	06:30 19:18	18:32 (4) 18:46 (4)	07:34 17:55
17	04:24 21:46	19:45 (3) 20:16 (3)	05:26 20:40	06:32 19:15	18:34 (4) 18:43 (4)	07:36 17:53
18	04:25 21:44	19:43 (3) 19:42 (3)	05:28 20:37	06:34 19:13	18:41 (4) 17:50	07:39 17:50
19	04:27 21:43	19:43 (3) 20:17 (3)	05:30 20:35	06:36 19:10	17:41 17:47	07:41 17:47
20	04:29 21:41	19:43 (3) 20:35 (2)	05:32 20:32	06:38 19:07	17:43 17:45	07:43 17:45
21	04:31 21:40	19:42 (3) 20:37 (2)	05:34 20:30	06:40 19:04	17:45 17:42	07:45 17:42
22	04:33 21:38	19:42 (3) 20:38 (2)	05:37 20:27	06:42 19:01	17:48 17:40	07:48 17:40
23	04:34 21:36	19:42 (3) 20:40 (2)	05:39 20:24	06:44 18:59	17:50 17:37	07:50 17:37
24	04:36 21:34	19:41 (3) 20:40 (2)	05:41 20:22	06:46 18:56	17:52 17:34	07:52 17:34
25	04:38 21:32	19:41 (3) 20:41 (2)	05:43 20:19	06:49 18:53	17:54 16:32	07:54 16:32
26	04:40 21:30	19:41 (3) 20:42 (2)	05:45 20:16	06:51 18:50	16:57 16:29	07:57 16:29
27	04:42 21:28	19:40 (3) 20:42 (2)	05:47 20:14	06:53 18:47	16:59 16:27	07:59 16:27
28	04:44 21:26	19:40 (3) 20:42 (2)	05:49 20:11	19:16 (1) 18:45	16:29 16:24	15:39 (5) 15:50 (5)
29	04:46 21:24	19:40 (3) 20:43 (2)	05:51 20:08	19:14 (1) 18:42	16:22 16:22	15:41 (5) 15:47 (5)
30	04:48 21:22	19:40 (3) 20:43 (2)	05:54 20:06	19:12 (1) 18:39	16:20 16:20	15:43 (5) 15:44 (5)
31	04:50 21:20	19:40 (3) 20:43 (2)	05:56 20:03	19:12 (1) 19:30 (1)	16:20 16:17	15:44 (5) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case	1035	675	411	249	382	759
Sun reduction	0,38	0,35	0,31	0,26	0,17	0,13
Oper. time red.	0,99	0,99	0,99	0,99	0,99	0,99
Wind dir. red.	0,60	0,60	0,64	0,69	0,70	0,70
Total reduction	0,23	0,22	0,20	0,18	0,12	0,09
Total, real	240	145	84	45	46	71

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Grevekulla 1:11 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (802)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January		February		March		April		May		June	
1	08:43		09:26 (5)	08:04	08:36 (1)	06:56	07:24 (3)	06:31	07:36 (2)	05:11	04:10	
	15:23	6	09:32 (5)	16:23	09:02 (1)	17:29	10	07:34 (3)	19:38	14	07:50 (2)	20:44
2	08:43		09:26 (5)	08:02	08:34 (4)	06:54		07:21 (3)	06:28		07:40 (2)	20:44
	15:24	7	09:33 (5)	16:25	09:03 (1)	17:31	13	07:34 (3)	19:40	4	07:44 (2)	20:47
3	08:43		09:25 (5)	08:00	08:32 (4)	06:51		07:18 (3)	06:25		05:06	04:07
	15:25	9	09:34 (5)	16:28	09:05 (1)	17:34	16	07:34 (3)	19:43		20:49	21:49
4	08:42		09:24 (5)	07:58	08:29 (4)	06:48		07:15 (3)	06:22		05:03	04:06
	15:27	10	09:34 (5)	16:30	09:05 (1)	17:36	18	07:33 (3)	19:45		20:51	21:50
5	08:42		09:23 (5)	07:55	08:27 (4)	06:46		07:15 (3)	06:20		05:01	04:05
	15:28	11	09:34 (5)	16:33	09:06 (1)	17:38	19	07:34 (3)	19:47		20:53	21:51
6	08:41		09:22 (5)	07:53	08:24 (4)	06:43		07:15 (3)	06:17		04:59	04:04
	15:30	13	09:35 (5)	16:35	09:06 (1)	17:40	18	07:33 (3)	19:49		20:55	21:53
7	08:40		09:21 (5)	07:51	08:24 (4)	06:40		07:16 (3)	06:14		04:56	04:03
	15:31	14	09:35 (5)	16:37	09:06 (1)	17:43	15	07:31 (3)	19:51		20:57	21:54
8	08:40		09:20 (5)	07:49	08:23 (4)	06:37		07:17 (3)	06:11		04:54	04:03
	15:33	16	09:36 (5)	16:40	09:06 (1)	17:45	12	07:29 (3)	19:54		21:00	21:55
9	08:39		09:19 (5)	07:47	08:23 (4)	06:35		07:19 (3)	06:09		04:52	04:02
	15:35	17	09:36 (5)	16:42	09:07 (1)	17:47	7	07:26 (3)	19:56		21:02	21:56
10	08:38		09:19 (5)	07:44	08:22 (4)	06:32			06:06		04:50	04:01
	15:36	18	09:37 (5)	16:44	09:06 (1)	17:49			19:58		21:04	21:57
11	08:37		09:19 (5)	07:42	08:23 (4)	06:29			06:03		04:47	04:00
	15:38	17	09:36 (5)	16:47	09:07 (1)	17:52			20:00		21:06	21:58
12	08:36		09:20 (5)	07:40	08:23 (4)	06:26			06:00		04:45	04:00
	15:40	17	09:37 (5)	16:49	09:06 (1)	17:54			20:02		21:08	21:59
13	08:35		09:21 (5)	07:37	08:24 (4)	06:24			05:58		04:43	03:59
	15:42	16	09:37 (5)	16:52	09:06 (1)	17:56			20:05		21:10	22:00
14	08:34		09:21 (5)	07:35	08:24 (4)	06:21		06:47 (2)	05:55		04:41	03:59
	15:44	16	09:37 (5)	16:54	09:05 (1)	17:58	7	06:54 (2)	20:07		21:12	22:01
15	08:32		09:22 (5)	07:32	08:25 (4)	06:18		06:44 (2)	05:52		04:39	03:59
	15:46	14	09:36 (5)	16:56	09:05 (1)	18:01	13	06:57 (2)	20:09		21:14	22:01
16	08:31		09:09 (6)	07:30	08:26 (4)	06:15		06:42 (2)	05:49		04:37	03:58
	15:48	14	09:36 (5)	16:59	09:04 (1)	18:03	18	07:00 (2)	20:11		21:16	22:02
17	08:30		09:07 (6)	07:27	08:27 (4)	06:13		06:39 (2)	05:47		04:35	03:58
	15:50	14	09:35 (5)	17:01	09:02 (1)	18:05	22	07:01 (2)	20:13		21:19	22:03
18	08:28		09:05 (6)	07:25	08:29 (4)	06:10		06:36 (2)	05:44		04:33	03:58
	15:52	13	09:33 (5)	17:03	09:01 (1)	18:07	25	07:01 (2)	20:16		21:21	22:03
19	08:27		09:04 (6)	07:22	08:37 (1)	06:07		06:33 (2)	05:41		04:31	03:58
	15:54	7	09:11 (6)	17:06	08:59 (1)	18:09	29	07:02 (2)	20:18		21:23	22:04
20	08:26		09:02 (6)	07:20	08:39 (1)	06:04		06:32 (2)	05:39		04:29	03:58
	15:56	9	09:11 (6)	17:08	08:56 (1)	18:12	30	07:02 (2)	20:20		21:24	22:04
21	08:24		09:00 (6)	07:17	08:43 (1)	06:01		06:31 (2)	05:36		04:27	03:58
	15:58	11	09:11 (6)	17:10	08:53 (1)	18:14	31	07:02 (2)	20:22		21:26	22:04
22	08:22		09:01 (6)	07:15		05:59		06:31 (2)	05:34		04:25	03:58
	16:00	9	09:10 (6)	17:13		18:16	31	07:02 (2)	20:24		21:28	22:04
23	08:21		09:03 (6)	07:12		05:56		06:30 (2)	05:31		04:23	03:58
	16:02	5	09:08 (6)	17:15		18:18	32	07:02 (2)	20:27		21:30	22:05
24	08:19			07:10		05:53		06:30 (2)	05:28		04:22	03:59
	16:05			17:17		18:21	31	07:01 (2)	20:29		21:32	22:05
25	08:17			07:07		05:50		06:30 (2)	05:26		04:20	03:59
	16:07			17:20		18:23	31	07:01 (2)	20:31		21:34	22:05
26	08:16		08:50 (1)	07:04		05:47		06:29 (2)	05:23		04:18	04:00
	16:09	2	08:52 (1)	17:22		18:25	31	07:00 (2)	20:33		21:36	22:05
27	08:14		08:48 (1)	07:02	07:29 (3)	05:45		06:30 (2)	05:21		04:17	04:00
	16:11	7	08:55 (1)	17:24	07:32 (3)	18:27	29	06:59 (2)	20:36		21:37	22:04
28	08:12		08:45 (1)	06:59	07:26 (3)	05:42		06:31 (2)	05:18		04:15	04:01
	16:14	12	08:57 (1)	17:27	07:33 (3)	18:29	27	06:58 (2)	20:38		21:39	22:04
29	08:10		08:43 (1)			06:39		07:31 (2)	05:16		04:14	04:01
	16:16	16	08:59 (1)			19:32	25	07:56 (2)	20:40		21:41	22:04
30	08:08		08:41 (1)			06:36		07:32 (2)	05:13		04:13	04:02
	16:18	19	09:00 (1)			19:34	22	07:54 (2)	20:42		21:42	22:03
31	08:06		08:39 (1)			06:33		07:33 (2)			04:11	
	16:21	23	09:02 (1)			19:36	19	07:52 (2)			21:44	
Potential sun hours	227			262		366		429		515		539
Total, worst case	362			752		581		18				
Sun reduction	0,19			0,16		0,22		0,42				
Oper. time red.	0,99			0,99		0,99		0,99				
Wind dir. red.	0,57			0,57		0,62		0,62				
Total reduction	0,10			0,09		0,13		0,26				
Total, real	38			68		78		5				

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Grevekulla 1:11 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (802)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:11 16:15	07:52 (4) 08:36 (1)
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	07:13 16:13	07:53 (4) 08:36 (1)
3	04:05 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	07:53 (4) 08:36 (1)
4	04:06 22:01	04:58 21:12	06:04 19:52	07:08 18:28	07:17 16:08	07:54 (4) 08:36 (1)
5	04:07 22:00	05:00 21:09	06:06 19:49	07:10 18:25	07:20 16:06	07:55 (4) 08:36 (1)
6	04:08 22:00	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:03	07:57 (4) 08:35 (1)
7	04:09 21:59	05:05 21:05	06:11 19:44	07:14 18:20	07:24 16:01	08:00 (4) 08:35 (1)
8	04:10 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:02 (4) 08:34 (1)
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:05 (4) 08:34 (1)
10	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:11	07:31 15:55	08:07 (1) 08:33 (1)
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:34 15:53	08:10 (1) 08:33 (1)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:13 (1) 08:32 (1)
13	04:17 21:52	05:17 20:50	06:23 19:27	07:28 18:03	07:38 15:49	08:15 (1) 08:30 (1)
14	04:19 21:51	05:20 20:48	06:25 19:24	07:30 18:01	07:40 15:47	08:18 (1) 08:29 (1)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:20 (1) 08:27 (1)
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	07:45 15:43	08:23 (1) 08:25 (1)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:25 (1) 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:37	08:40 15:12
20	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	04:31 21:40	05:34 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:45 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:32	08:46 15:14
23	04:35 21:36	05:39 20:25	06:44 18:59	07:50 17:37	08:00 15:31	08:47 15:14
24	04:36 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:29	08:48 15:15
25	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:49 15:15
26	04:40 21:30	05:45 20:17	06:51 18:50	07:56 16:30	08:06 15:26	08:51 15:16
27	04:42 21:29	05:47 20:14	06:53 18:47	07:58 16:27	08:08 15:25	08:53 15:17
28	04:44 21:27	05:49 20:11	06:55 18:45	08:00 16:25	08:10 15:24	08:55 15:18
29	04:46 21:24	05:52 20:08	06:57 18:42	08:02 16:22	08:12 15:23	08:57 15:19
30	04:48 21:22	05:54 20:06	06:59 18:39	08:04 16:20	08:14 15:21	08:59 15:20
31	04:50 21:20	05:56 20:03		08:06 16:17	08:16 15:21	09:01 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case			474	514	594	178
Sun reduction			0,31	0,26	0,17	0,13
Oper. time red.			0,99	0,99	0,99	0,99
Wind dir. red.			0,62	0,58	0,57	0,58
Total reduction			0,19	0,15	0,10	0,07
Total, real			91	75	57	13

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:10>2 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (873)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23 13	14:22 (B0024) 16:23 18	15:19 (B0023) 17:29 9	16:50 (B0021) 19:38 12	05:11 20:44 4	19:49 (B0018) 21:45 19:53 (B0018)
2	08:43 15:24 13	14:22 (B0024) 16:26 18	15:19 (B0023) 17:31 12	16:49 (B0021) 19:40 13	05:08 20:46 13	04:09 21:47 04:08
3	08:42 15:26 14	14:22 (B0024) 16:28 17	15:19 (B0023) 17:34 13	16:49 (B0021) 19:42 14	05:06 20:49 14	04:08 21:48 04:07
4	08:42 15:27 14	14:23 (B0024) 16:30 16	15:20 (B0023) 17:36 14	16:48 (B0021) 19:45 15	05:04 20:51 15	04:07 21:50 04:06
5	08:41 15:28 15	14:23 (B0024) 16:33 14	15:22 (B0023) 17:38 13	16:48 (B0021) 19:47 16	05:01 20:53 16	04:06 21:51 04:05
6	08:41 15:30 15	14:23 (B0024) 16:35 12	15:22 (B0023) 17:40 11	16:50 (B0021) 19:49 17	04:59 20:55 17	04:05 21:52 04:04
7	08:40 15:31 16	14:23 (B0024) 16:37 8	15:25 (B0023) 17:43 8	16:51 (B0021) 19:51 18	04:57 20:57 18	04:04 21:53 04:03
8	08:39 15:33 16	14:24 (B0024) 16:40 17	15:33 (B0023) 17:45 9	16:59 (B0021) 19:53 19	04:54 20:59 19	04:03 21:55 04:02
9	08:38 15:35 17	14:23 (B0024) 16:42 18	15:36 (B0023) 17:47 10	16:59 (B0021) 19:56 20	04:52 21:02 20	04:02 21:56 04:01
10	08:38 15:37 16	14:24 (B0024) 16:44 19	15:36 (B0023) 17:49 11	16:59 (B0021) 19:58 21	04:50 21:04 21	04:01 21:57 04:00
11	08:37 15:38 17	14:24 (B0024) 16:47 20	15:38 (B0023) 17:52 12	16:59 (B0021) 20:00 22	04:48 21:06 22	04:01 21:58 04:00
12	08:36 15:40 17	14:25 (B0024) 16:49 21	15:40 (B0023) 17:54 13	16:59 (B0021) 20:02 23	04:45 21:08 23	04:00 21:59 04:00
13	08:34 15:42 17	14:25 (B0024) 16:52 22	15:42 (B0023) 17:56 14	16:59 (B0021) 20:04 24	04:43 21:10 24	04:00 22:00 03:59
14	08:33 15:44 16	14:26 (B0024) 16:54 23	15:44 (B0023) 17:58 15	17:25 (B0020) 20:07 25	04:41 21:12 25	03:59 22:00 03:59
15	08:32 15:46 16	14:26 (B0024) 16:56 24	15:46 (B0023) 18:01 16	17:23 (B0020) 20:09 26	04:39 21:14 26	03:59 22:01 03:59
16	08:31 15:48 15	14:27 (B0024) 16:59 25	15:48 (B0023) 18:03 17	17:23 (B0020) 20:11 27	04:37 21:16 27	03:59 22:02 03:58
17	08:30 15:50 14	14:28 (B0024) 17:01 26	15:50 (B0023) 18:05 18	17:22 (B0020) 20:13 28	04:35 21:18 28	03:58 22:02 03:58
18	08:28 15:52 13	14:29 (B0024) 17:03 27	15:52 (B0023) 18:07 19	17:22 (B0020) 20:15 29	04:33 21:20 29	03:58 22:03 03:58
19	08:27 15:54 11	14:30 (B0024) 17:06 28	15:54 (B0023) 18:09 20	17:22 (B0020) 20:18 30	04:31 21:22 30	03:58 22:03 03:58
20	08:25 15:56 9	14:31 (B0024) 17:08 29	15:56 (B0023) 18:12 21	17:22 (B0020) 20:20 31	04:29 21:24 31	03:58 22:04 03:58
21	08:24 15:58 4	14:34 (B0024) 17:10 30	16:01 (B0021) 18:14 22	17:24 (B0020) 20:22 2	19:49 (B0018) 21:26 3	03:58 22:04 03:59
22	08:22 16:01 3	14:38 (B0024) 17:15 29	16:03 (B0021) 18:16 23	17:30 (B0020) 20:24 3	19:51 (B0018) 21:28 4	03:59 22:04 03:59
23	08:20 16:03 2	14:41 (B0024) 17:15 28	16:05 (B0021) 18:18 24	17:30 (B0020) 20:26 4	19:47 (B0018) 21:30 5	03:59 22:04 03:59
24	08:19 16:05 1	15:25 (B0023) 17:17 27	16:07 (B0021) 18:20 25	17:30 (B0020) 20:28 5	19:52 (B0018) 21:32 6	03:59 22:04 03:59
25	08:17 16:07 7	15:21 (B0023) 17:20 26	16:09 (B0021) 18:23 26	17:30 (B0020) 20:31 6	19:55 (B0018) 21:34 7	03:59 22:04 04:00
26	08:15 16:09 11	15:20 (B0023) 17:22 25	16:11 (B0021) 18:25 27	17:30 (B0020) 20:33 7	19:58 (B0018) 21:35 8	04:00 22:04 04:01
27	08:13 16:12 13	15:20 (B0023) 17:24 24	16:13 (B0021) 18:27 28	17:30 (B0020) 20:35 8	19:58 (B0018) 21:37 9	04:01 22:04 04:01
28	08:12 16:14 15	15:19 (B0023) 17:27 23	16:15 (B0021) 18:29 29	17:30 (B0020) 20:38 9	19:58 (B0018) 21:39 10	04:01 22:04 04:02
29	08:10 16:16 16	15:19 (B0023) 17:27 22	16:17 (B0021) 18:31 30	17:30 (B0020) 20:40 10	19:58 (B0018) 21:40 11	04:02 22:03 04:03
30	08:08 16:19 17	15:19 (B0023) 17:27 21	16:19 (B0021) 18:33 31	17:30 (B0020) 20:42 11	19:57 (B0018) 21:42 12	04:03 22:03 04:03
31	08:06 16:21 18	15:18 (B0023) 17:27 20	16:21 (B0021) 18:36 1	17:30 (B0020) 20:44 12	19:56 (B0018) 21:44 13	04:03 22:03 04:03
Potential sun hours	228	262	366	429	515	539
Total, worst case	396	108	157	103	4	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,68	0,66	0,60	0,60	
Total reduction	0,13	0,11	0,15	0,25	0,32	
Total, real	51	12	23	26	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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:10>2 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (873)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December	
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:21	14:06 (B0024) 14:23 (B0024)
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20	14:07 (B0024) 14:23 (B0024)
3	04:05 22:01	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19	14:07 (B0024) 14:24 (B0024)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18	14:08 (B0024) 14:24 (B0024)
5	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17	14:08 (B0024) 14:24 (B0024)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 17:29 (B0021)	08:24 15:16	14:09 (B0024) 14:25 (B0024)
7	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 17:36 (B0021)	08:26 15:15	14:09 (B0024) 14:24 (B0024)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:26 17:36 (B0021)	08:27 15:15	14:10 (B0024) 14:24 (B0024)
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 17:37 (B0021)	08:29 15:14	14:11 (B0024) 14:25 (B0024)
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	07:31 17:37 (B0021)	08:30 15:14	14:11 (B0024) 14:25 (B0024)
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 17:36 (B0021)	08:31 15:13	14:13 (B0024) 14:25 (B0024)
12	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 17:34 (B0021)	08:33 15:13	14:13 (B0024) 14:25 (B0024)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:27 18:03	07:38 17:31 (B0021)	08:34 15:13	14:13 (B0024) 14:25 (B0024)
14	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 17:28 (B0021)	08:35 15:12	14:15 (B0024) 14:26 (B0024)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:12	14:15 (B0024) 14:26 (B0024)
16	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12	14:16 (B0024) 14:26 (B0024)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:12	14:17 (B0024) 14:25 (B0024)
18	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:13	14:18 (B0024) 14:26 (B0024)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13	14:19 (B0024) 14:26 (B0024)
20	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13	14:18 (B0024) 14:26 (B0024)
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13	14:19 (B0024) 14:26 (B0024)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 18:11 (B0020)	07:58 15:34	08:42 14:08 (B0024)	14:19 (B0024) 14:26 (B0024)
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 18:08 (B0020)	08:00 15:33	08:42 14:07 (B0024)	14:20 (B0024) 14:26 (B0024)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 18:17 (B0020)	08:02 15:30	08:43 14:06 (B0024)	14:21 (B0024) 14:28 (B0024)
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 18:05 (B0020)	08:04 15:28	08:43 14:06 (B0024)	14:21 (B0024) 14:28 (B0024)
26	04:41 21:30	05:45 20:16	06:51 18:50	07:56 18:17 (B0020)	08:06 15:27	08:43 14:06 (B0024)	14:21 (B0024) 14:29 (B0024)
27	04:42 21:28	05:47 20:14	06:53 18:47	07:59 18:04 (B0020)	08:08 15:25	08:43 14:05 (B0024)	14:21 (B0024) 14:30 (B0024)
28	04:44 21:26	05:50 20:11	06:55 18:45	08:01 18:16 (B0020)	08:10 15:24	08:43 14:05 (B0024)	14:21 (B0024) 14:31 (B0024)
29	04:46 21:24	05:52 20:08	06:57 18:42	08:03 18:13 (B0020)	08:12 15:24	08:43 14:06 (B0024)	14:22 (B0024) 14:32 (B0024)
30	04:48 21:22	05:54 20:06	06:59 18:39	08:06 18:05 (B0020)	08:14 15:23	08:43 14:06 (B0024)	14:22 (B0024) 14:33 (B0024)
31	04:50 21:20	05:56 20:03		08:08 16:20	08:16 15:22	08:43 15:20	14:22 (B0024) 14:33 (B0024)
Potential sun hours	538	474	386	321	241	207	
Total, worst case		108	76	89	333	348	
Sun reduction		0,35	0,31	0,26	0,17	0,13	
Oper. time red.		0,99	0,99	0,99	0,99	0,99	
Wind dir. red.		0,60	0,66	0,67	0,69	0,70	
Total reduction		0,21	0,21	0,17	0,12	0,09	
Total, real		23	16	16	40	32	

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (860)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:01	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:45 17:38	06:19 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:03	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:53	04:09 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:44	06:37 17:49	06:11 19:58	04:54 21:04	04:03 21:57	04:11 21:55	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:34 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 19:31	05:42 19:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 19:34	05:40 19:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 19:36	05:38 19:36	05:11 21:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 16:17	08:14 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:15>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (891)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January			February			March			April			May			June		
1	08:43		14:12 (B0024)	08:04		15:12 (B0023)	06:56		16:48 (B0021)	06:31			05:11			19:49 (B0018)	04:10	
	15:23	16	14:28 (B0024)	16:23	18	15:30 (B0023)	17:29	11	16:59 (B0021)	19:38			20:44	13		20:02 (B0018)	21:45	
2	08:43		14:12 (B0024)	08:02		15:13 (B0023)	06:54		16:47 (B0021)	06:28			05:08			19:50 (B0018)	04:09	
	15:24	16	14:28 (B0024)	16:26	17	15:30 (B0023)	17:31	14	17:01 (B0021)	19:40			20:46	12		20:02 (B0018)	21:47	
3	08:42		14:12 (B0024)	08:00		15:13 (B0023)	06:51		16:47 (B0021)	06:25			05:06			19:50 (B0018)	04:08	
	15:26	17	14:29 (B0024)	16:28	16	15:29 (B0023)	17:34	14	17:01 (B0021)	19:42			20:49	9		19:59 (B0018)	21:48	
4	08:42		14:13 (B0024)	07:57		15:14 (B0023)	06:48		16:46 (B0021)	06:22			05:04			19:53 (B0018)	04:07	
	15:27	17	14:30 (B0024)	16:30	15	15:29 (B0023)	17:36	15	17:01 (B0021)	19:45			20:51	4		19:57 (B0018)	21:50	
5	08:41		14:13 (B0024)	07:55		15:16 (B0023)	06:46		16:46 (B0021)	06:20			05:01				21:51	
	15:28	17	14:30 (B0024)	16:33	12	15:28 (B0023)	17:38	14	17:00 (B0021)	19:47			20:53				21:51	
6	08:41		14:14 (B0024)	07:53		15:18 (B0023)	06:43		16:48 (B0021)	06:17			04:59				21:51	
	15:30	17	14:31 (B0024)	16:35	7	15:25 (B0023)	17:40	12	17:00 (B0021)	19:49			20:55				21:52	
7	08:40		14:14 (B0024)	07:51			06:40		16:49 (B0021)	06:14			04:57				21:52	
	15:31	17	14:31 (B0024)	16:37			17:43	9	16:58 (B0021)	19:51			20:57				21:53	
8	08:39		14:15 (B0024)	07:49			06:37			06:11			04:54				21:53	
	15:33	17	14:32 (B0024)	16:40			17:45			19:53			20:59				21:55	
9	08:38		14:14 (B0024)	07:46			06:35			06:09			04:52				21:55	
	15:35	17	14:31 (B0024)	16:42			17:47			19:56			21:02				21:56	
10	08:38		14:15 (B0024)	07:44			06:32			06:06			04:50				21:56	
	15:37	17	14:32 (B0024)	16:45			17:49			19:58			21:04				21:57	
11	08:37		14:16 (B0024)	07:42			06:29			06:03			04:48				21:57	
	15:38	17	14:33 (B0024)	16:47			17:52			20:00			21:06				21:58	
12	08:36		14:17 (B0024)	07:39			06:26			06:00			04:45				21:58	
	15:40	16	14:33 (B0024)	16:49			17:54			20:02			21:08				21:59	
13	08:35		14:17 (B0024)	07:37			06:24			05:58			04:43				21:59	
	15:42	16	14:33 (B0024)	16:52			17:56			20:04			21:10				22:00	
14	08:33		14:18 (B0024)	07:35			06:21		17:26 (B0020)	05:55			04:41				22:00	
	15:44	15	14:33 (B0024)	16:54			17:58	3	17:29 (B0020)	20:07			21:12				22:00	
15	08:32		14:18 (B0024)	07:32			06:18		17:23 (B0020)	05:52			04:39				22:00	
	15:46	15	14:33 (B0024)	16:56			18:01	8	17:31 (B0020)	20:09			21:14				22:01	
16	08:31		14:19 (B0024)	07:30			06:15		17:23 (B0020)	05:50			04:37				22:01	
	15:48	13	14:32 (B0024)	16:59			18:03	11	17:34 (B0020)	20:11			21:16				22:02	
17	08:30		14:21 (B0024)	07:27			06:13		17:22 (B0020)	05:47			04:35				22:02	
	15:50	11	14:32 (B0024)	17:01			18:05	13	17:35 (B0020)	20:13			21:18				22:02	
18	08:28		14:22 (B0024)	07:25			06:10		17:21 (B0020)	05:44			04:33				22:02	
	15:52	9	14:31 (B0024)	17:03			18:07	14	17:35 (B0020)	20:15			21:20				22:03	
19	08:27		14:25 (B0024)	07:22			06:07		17:21 (B0020)	05:42			04:31				22:03	
	15:54	4	14:29 (B0024)	17:06			18:09	13	17:34 (B0020)	20:18			21:22				22:03	
20	08:25			07:20			06:04		17:21 (B0020)	05:39			04:29				22:04	
	15:56			17:08			18:12	12	17:33 (B0020)	20:20			21:24				22:04	
21	08:24			07:17			06:01		17:22 (B0020)	05:36			04:27				22:04	
	15:58			17:10			18:14	10	17:32 (B0020)	20:22			21:26				22:04	
22	08:22		15:16 (B0023)	07:15			05:59		17:25 (B0020)	05:34			04:26				22:04	
	16:01	5	15:21 (B0023)	17:13			18:16	5	17:30 (B0020)	20:24			21:28				22:04	
23	08:20		15:14 (B0023)	07:12			05:56			05:31		19:54 (B0018)	04:24				22:04	
	16:03	10	15:24 (B0023)	17:15			18:18			20:27	1	19:55 (B0018)	21:30				22:04	
24	08:19		15:13 (B0023)	07:09			05:53			05:28		19:51 (B0018)	04:22				22:04	
	16:05	13	15:26 (B0023)	17:17			18:20			20:29	5	19:56 (B0018)	21:32				22:04	
25	08:17		15:11 (B0023)	07:07			05:50			05:26		19:50 (B0018)	04:20				22:04	
	16:07	15	15:26 (B0023)	17:20			18:23			20:31	9	19:59 (B0018)	21:34				22:04	
26	08:15		15:11 (B0023)	07:04			05:47			05:23		19:50 (B0018)	04:19				22:04	
	16:09	16	15:27 (B0023)	17:22			18:25			20:33	11	20:01 (B0018)	21:35				22:04	
27	08:13		15:11 (B0023)	07:02		16:51 (B0021)	05:45			05:21		19:48 (B0018)	04:17				22:04	
	16:12	17	15:28 (B0023)	17:24	3	16:54 (B0021)	18:27			20:35	15	20:03 (B0018)	21:37				22:04	
28	08:12		15:11 (B0023)	06:59		16:49 (B0021)	05:42			05:18		19:48 (B0018)	04:16				22:04	
	16:14	18	15:29 (B0023)	17:27	7	16:56 (B0021)	18:29			20:38	15	20:03 (B0018)	21:39				22:04	
29	08:10		15:11 (B0023)				06:39			05:16		19:48 (B0018)	04:14				22:04	
	16:16	19	15:30 (B0023)				19:31			20:40	15	20:03 (B0018)	21:40				22:04	
30	08:08		15:11 (B0023)				06:36			05:13		19:48 (B0018)	04:13				22:04	
	16:19	19	15:30 (B0023)				19:34			20:42	15	20:03 (B0018)	21:42				22:04	
31	08:06		15:11 (B0023)				06:33						04:12				22:04	
	16:21	19	15:30 (B0023)				19:36						21:44				22:04	
Potential sun hours	228			262			366			429			515				539	
Total, worst case		435			95			178			86			38				
Sun reduction		0,19			0,16			0,22			0,42			0,53				
Oper. time red.		0,99			0,99			0,99			0,99			0,99				
Wind dir. red.		0,69			0,68			0,66			0,60			0,60				
Total reduction		0,13			0,11			0,15			0,26			0,32				
Total, real		56			11			26			22			12				

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:15>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (891)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December	
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:21	13:58 (B0024) 14:15 (B0024)
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20	13:58 (B0024) 14:15 (B0024)
3	04:05 22:01	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19	13:58 (B0024) 14:16 (B0024)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18	13:59 (B0024) 14:16 (B0024)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17	13:59 (B0024) 14:16 (B0024)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 17:33 (B0021)	08:24 14:45 (B0023)	14:00 (B0024) 14:17 (B0024)
7	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 17:34 (B0021)	08:26 14:44 (B0023)	13:59 (B0024) 14:17 (B0024)
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:26 17:35 (B0021)	08:27 15:00 (B0023)	14:00 (B0024) 14:17 (B0024)
9	04:12 21:56	05:09 21:00	20:01 (B0018) 20:08 (B0018)	06:15 19:38	07:29 18:14	08:29 15:01 (B0023)	14:01 (B0024) 14:18 (B0024)
10	04:13 21:55	05:11 20:57	19:59 (B0018) 20:09 (B0018)	06:17 19:35	07:31 18:12	08:30 15:01 (B0023)	14:01 (B0024) 14:17 (B0024)
11	04:15 21:54	05:13 20:55	19:58 (B0018) 20:10 (B0018)	06:19 19:32	07:33 18:09	08:31 15:01 (B0023)	14:02 (B0024) 14:18 (B0024)
12	04:16 21:53	05:15 20:52	19:57 (B0018) 20:11 (B0018)	06:21 19:30	07:36 18:06	08:33 15:01 (B0023)	14:03 (B0024) 14:18 (B0024)
13	04:18 21:52	05:18 20:50	19:56 (B0018) 20:11 (B0018)	06:23 19:27	07:38 18:03	08:34 15:01 (B0023)	14:03 (B0024) 14:18 (B0024)
14	04:19 21:50	05:20 20:48	19:56 (B0018) 20:11 (B0018)	06:25 19:24	07:40 18:01	08:35 15:01 (B0023)	14:04 (B0024) 14:19 (B0024)
15	04:21 21:49	05:22 20:45	19:56 (B0018) 20:11 (B0018)	06:28 19:21	07:42 17:58	08:36 15:01 (B0023)	14:05 (B0024) 14:19 (B0024)
16	04:23 21:47	05:24 20:42	19:56 (B0018) 20:10 (B0018)	06:30 19:18	07:45 17:55	08:37 15:00 (B0023)	14:05 (B0024) 14:20 (B0024)
17	04:24 21:46	05:26 20:40	19:56 (B0018) 20:07 (B0018)	06:32 19:16	07:47 17:53	08:38 15:00 (B0023)	14:06 (B0024) 14:20 (B0024)
18	04:26 21:44	05:28 20:37	19:57 (B0018) 20:05 (B0018)	06:34 19:13	07:49 17:50	08:39 15:39	14:06 (B0024) 14:20 (B0024)
19	04:28 21:43	05:30 20:35	19:58 (B0018) 20:02 (B0018)	06:36 19:10	07:51 17:48	08:40 14:58 (B0023)	14:07 (B0024) 14:21 (B0024)
20	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 14:55 (B0023)	14:07 (B0024) 14:21 (B0024)
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13	14:08 (B0024) 14:22 (B0024)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 18:08 (B0020)	07:58 17:40	08:42 15:14	14:08 (B0024) 14:22 (B0024)
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 18:18 (B0020)	08:00 15:31	08:42 14:02 (B0024)	14:09 (B0024) 14:23 (B0024)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 18:05 (B0020)	08:02 15:30	08:43 13:59 (B0024)	14:09 (B0024) 14:23 (B0024)
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 18:04 (B0020)	08:04 15:28	08:43 14:10 (B0024)	14:09 (B0024) 14:23 (B0024)
26	04:41 21:30	05:45 20:16	06:51 18:50	07:56 18:04 (B0020)	08:06 15:27	08:43 13:58 (B0024)	14:10 (B0024) 14:24 (B0024)
27	04:42 21:28	05:47 20:14	06:53 18:47	07:59 18:04 (B0020)	08:08 15:25	08:43 14:12 (B0024)	14:10 (B0024) 14:24 (B0024)
28	04:44 21:26	05:50 20:11	06:55 18:45	08:01 18:13 (B0020)	08:10 15:24	08:43 14:12 (B0024)	14:10 (B0024) 14:25 (B0024)
29	04:46 21:24	05:52 20:08	06:57 18:42	08:03 18:06 (B0020)	08:12 15:23	08:43 13:58 (B0024)	14:11 (B0024) 14:26 (B0024)
30	04:48 21:22	05:54 20:06	06:59 18:39	08:06 16:22	08:14 15:22	08:43 14:14 (B0024)	14:12 (B0024) 14:27 (B0024)
31	04:50 21:20	05:56 20:03	07:08 16:17	08:08 16:20	15:22 16:17	08:43 15:21	14:11 (B0024) 14:27 (B0024)
Potential sun hours	538	474	386	321	241	207	
Total, worst case		125	87	101	336	476	
Sun reduction		0,35	0,31	0,26	0,17	0,13	
Oper. time red.		0,99	0,99	0,99	0,99	0,99	
Wind dir. red.		0,60	0,66	0,67	0,69	0,70	
Total reduction		0,21	0,21	0,18	0,12	0,09	
Total, real		27	18	18	40	44	

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:16>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (858)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:01	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:53	04:09 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:44	06:37 17:49	06:11 19:58	04:54 21:04	04:03 21:57	04:11 21:55	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:59 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:48 17:40	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:41	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (847)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:01	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:45 17:38	06:19 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:03	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:53	04:09 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:44	06:37 17:49	06:11 19:58	04:54 21:04	04:03 21:57	04:11 21:55	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:34 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (924)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:01	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:45 17:38	06:19 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:03	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:53	04:09 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:44	06:37 17:49	06:11 19:58	04:54 21:04	04:03 21:57	04:11 21:55	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:34 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (836)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:01	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:37	06:45 17:38	06:19 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:03	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:53	04:09 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:01	08:26 15:15
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9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:34 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
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23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
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29	08:10 16:16	06:59 19:31	05:42 19:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 19:34	05:40 19:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 19:36	05:38 19:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 16:17	08:14 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 3:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (846)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:56 21:13	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
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6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
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8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:59 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	07:58 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:43 15:16
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:37	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HUSTOMTA 3:1>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (895)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	16:46 (B0023) 17:38	06:31 20:44	05:11 21:45	04:10 22:02	04:03 21:18	04:52 20:00	05:58 18:36	07:01 16:15	08:15 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	16:46 (B0023) 17:40	06:28 20:46	05:08 21:47	04:09 22:02	04:04 21:16	04:54 20:00	07:04 18:33	07:13 16:13	08:17 15:20
3	08:42 15:25	07:59 16:28	06:51 17:34	16:46 (B0023) 17:42	06:25 20:48	05:06 21:48	04:08 22:01	04:05 21:13	04:57 20:02	07:06 18:31	07:15 16:10	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	16:47 (B0023) 17:45	06:22 20:51	05:04 21:49	04:07 22:01	04:06 21:11	04:59 20:04	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:28	07:55 16:33	06:45 17:38	16:48 (B0023) 17:55	06:20 20:53	05:01 21:51	04:06 22:00	05:01 21:09	06:06 20:06	07:10 18:25	07:20 16:06	08:22 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	16:55 (B0023) 17:47	06:17 20:55	04:59 21:52	04:08 21:59	05:03 21:07	06:09 20:07	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	16:55 (B0023) 17:43	06:14 20:57	04:57 21:53	04:04 21:58	05:05 21:04	06:11 20:04	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	16:55 (B0023) 17:45	06:11 20:59	04:54 21:55	04:03 21:57	05:07 21:02	06:13 20:07	07:16 18:27	17:26 (B0023) 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	16:55 (B0023) 17:47	06:09 21:01	04:52 21:56	04:02 21:56	05:09 21:00	06:15 20:06	07:19 18:24	17:32 (B0023) 15:57	08:29 15:14
10	08:37 15:37	07:44 16:44	06:32 17:49	16:55 (B0023) 17:49	06:06 21:04	04:50 21:57	04:01 21:55	05:11 20:57	06:17 20:07	07:21 18:21	17:32 (B0023) 15:55	08:30 15:14
11	08:37 15:38	07:42 16:47	16:12 (B0024) 17:52	16:55 (B0023) 17:52	06:03 21:06	04:47 21:58	04:01 21:55	05:13 20:55	06:19 20:07	07:23 18:09	17:32 (B0023) 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	16:10 (B0024) 17:54	16:55 (B0023) 17:54	06:00 21:08	04:45 21:59	04:00 21:53	05:15 20:52	06:21 20:06	07:25 18:06	17:32 (B0023) 15:51	08:33 15:13
13	08:34 15:42	07:37 16:52	16:08 (B0024) 17:56	16:55 (B0023) 17:56	05:58 21:10	04:43 21:59	04:00 21:51	05:18 20:50	06:23 20:07	07:27 18:03	17:32 (B0023) 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	16:08 (B0024) 17:58	16:55 (B0023) 17:58	05:55 21:12	04:41 22:00	03:59 21:50	05:20 20:47	06:25 20:07	07:30 18:01	17:32 (B0023) 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	16:08 (B0024) 18:01	16:55 (B0023) 18:01	05:52 21:14	04:39 22:01	03:59 21:49	05:22 20:45	06:27 20:07	07:32 18:06	17:32 (B0023) 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	16:08 (B0024) 18:03	16:55 (B0023) 18:03	05:50 21:16	04:37 22:02	03:59 21:47	05:24 20:42	06:30 20:07	07:34 18:06	17:32 (B0023) 15:43	08:37 15:12
17	08:29 15:50	07:27 17:01	16:08 (B0024) 18:05	16:55 (B0023) 18:05	05:47 21:18	04:35 22:02	03:58 21:46	05:26 20:40	06:32 20:07	07:36 18:01	17:32 (B0023) 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	16:09 (B0024) 18:07	16:55 (B0023) 18:07	05:44 21:20	04:33 22:03	03:58 21:44	05:28 20:37	06:34 20:07	07:38 18:01	17:32 (B0023) 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	16:11 (B0024) 18:09	16:55 (B0023) 18:09	05:41 21:22	04:31 22:03	03:58 21:43	05:30 20:35	06:36 20:07	07:41 18:01	17:32 (B0023) 15:37	08:40 15:13
20	08:25 15:56	07:20 17:08	16:13 (B0024) 18:12	16:55 (B0023) 18:12	05:39 21:24	04:29 22:03	03:58 21:41	05:32 20:32	06:38 20:07	07:43 18:01	17:32 (B0023) 15:35	08:40 15:13
21	08:24 15:58	07:17 17:10	16:15 (B0024) 18:14	16:55 (B0023) 18:14	05:36 21:26	04:27 22:04	03:58 21:39	05:35 20:30	06:40 20:07	07:45 18:01	17:32 (B0023) 15:33	08:41 15:13
22	08:22 16:00	07:15 17:13	16:16 (B0024) 18:16	16:55 (B0023) 18:16	05:34 21:28	04:26 22:04	03:59 21:38	05:37 20:27	06:42 20:07	07:47 18:01	16:42 (B0024) 15:33	08:42 15:14
23	08:20 16:03	07:12 17:15	16:16 (B0024) 18:18	16:55 (B0023) 18:18	05:31 21:30	04:24 22:04	03:59 21:36	05:39 20:24	06:44 20:07	07:50 18:01	16:40 (B0024) 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	16:17 (B0024) 18:20	16:55 (B0023) 18:20	05:28 21:32	04:22 22:04	03:59 21:34	05:41 20:22	06:46 20:07	07:52 18:01	16:39 (B0024) 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	16:18 (B0024) 18:23	16:55 (B0023) 18:23	05:26 21:33	04:20 22:04	04:00 21:32	05:43 20:19	06:49 20:07	06:54 18:01	16:38 (B0024) 15:28	08:43 15:16
26	08:15 16:09	07:04 17:22	16:19 (B0024) 18:25	16:55 (B0023) 18:25	05:23 21:35	04:19 22:04	04:00 21:30	05:45 20:16	06:51 20:07	06:57 18:01	16:37 (B0024) 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	16:20 (B0024) 18:27	16:55 (B0023) 18:27	05:21 21:37	04:17 22:04	04:01 21:28	05:47 20:14	06:53 20:07	06:59 18:01	16:36 (B0024) 15:25	08:43 15:17
28	08:11 16:14	06:59 17:27	16:21 (B0024) 18:29	16:55 (B0023) 18:29	05:18 21:39	04:16 22:04	04:01 21:26	05:49 20:11	06:55 20:07	07:01 18:01	16:35 (B0024) 15:24	08:43 15:18
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30	08:08 16:19	07:00 17:31	16:23 (B0024) 18:32	16:55 (B0023) 18:32	05:13 21:41	04:13 22:03	04:03 21:22	05:54 20:06	06:59 20:07	07:06 18:01	16:33 (B0024) 15:22	08:43 15:20
31	08:06 16:21	07:00 17:32	16:24 (B0024) 18:33	16:55 (B0023) 18:33	05:11 21:42	04:11 22:03	04:00 21:20	05:56 20:03	07:08 20:07	07:08 18:01	16:32 (B0024) 15:21	08:43 15:21
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
Total, worst case		112	55							166		
Sun reduction		0,16	0,22							0,26		
Oper. time red.		0,99	0,99							0,99		
Wind dir. red.		0,69	0,67							0,69		
Total reduction		0,11	0,15							0,18		
Total, real		12	8							29		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Hyltestugan - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (804)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:22	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:11 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:47	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:18 15:19
3	08:43 15:25	08:00 16:28	06:51 17:33	06:25 19:42	05:06 20:49	04:07 21:49	04:05 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:26	07:58 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:06 21:50	04:06 22:01	04:58 21:12	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
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6	08:41 15:29	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:04 21:53	04:08 22:00	05:02 21:07	06:08 19:46	07:12 18:22	07:22 16:03	08:25 15:16
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25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:05	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:43 15:15
26	08:16 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:18 21:36	03:59 22:05	04:40 21:31	05:45 20:17	06:51 18:50	06:57 16:29	08:06 15:26	08:44 15:16
27	08:14 16:11	07:02 17:24	05:45 18:27	05:21 20:36	04:17 21:37	04:00 22:04	04:42 21:29	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:15 21:39	04:01 22:04	04:44 21:27	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:39 19:31	05:16 20:40	04:14 21:41	04:01 22:04	04:01 21:25	04:46 20:08	05:51 18:42	06:57 16:22	07:04 15:22	08:12 15:19	08:44 15:19
30	08:08 16:18	06:36 19:34	05:13 20:42	04:12 21:42	04:02 22:03	04:02 21:22	04:48 20:06	05:54 18:39	06:59 16:20	07:06 15:21	08:14 15:20	08:44 15:20
31	08:06 16:21	06:33 19:36	05:11 20:44	04:11 21:44	04:01 22:04	04:01 21:20	04:50 20:03	05:56 16:17	07:08 15:21	07:08 15:21	08:14 15:21	08:44 15:21
Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HARSTORP 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (837)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:03 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:02	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:24	08:01 16:26	06:53 17:31	06:28 19:40	05:08 20:46	04:09 21:46	04:04 22:02	04:55 21:16	06:00 19:57	07:03 18:33	07:13 16:13	08:17 15:20
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:54	07:06 18:31	07:15 16:10	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:00	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:28	07:55 16:33	06:45 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:19 16:06	08:22 15:17
6	08:40 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:32	07:51 16:37	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:01	08:25 15:15
8	08:39 15:33	07:48 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:54	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:55	04:52 21:01	04:02 21:55	04:12 21:56	05:09 20:59	06:15 19:38	07:19 18:14	07:29 15:57	08:28 15:14
10	08:37 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:03	04:02 21:56	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:14
11	08:36 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:57	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:58	04:16 21:53	05:15 20:52	06:21 19:29	07:25 18:06	07:35 15:51	08:32 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:06	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	03:59 22:01	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:44 15:43	08:37 15:12
17	08:29 15:50	07:27 17:01	06:12 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:02	04:26 21:44	05:28 20:37	06:34 19:13	07:38 17:50	07:49 15:39	08:39 15:13
19	08:27 15:54	07:22 17:06	06:07 18:09	05:42 20:18	04:31 21:22	03:58 22:03	04:28 21:42	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:39 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:03	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:23 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:59 22:04	04:31 21:39	05:35 20:29	06:40 19:04	07:45 17:42	07:55 15:34	08:41 15:13
22	08:22 16:01	07:14 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:37	05:37 20:27	06:42 19:01	07:47 17:40	07:57 15:33	08:41 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:31	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:33	04:00 22:04	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:16
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:41 21:30	05:45 20:16	06:51 18:50	06:56 16:30	08:06 15:27	08:43 15:17
27	08:13 16:12	07:01 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:01 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:11 16:14	06:59 17:27	05:42 18:29	05:18 20:37	04:16 21:39	04:01 22:03	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:09 16:16		06:39 19:31	05:16 20:40	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:07 16:19		06:36 19:34	05:13 20:42	04:13 21:42	04:03 22:03	04:48 21:22	05:54 20:05	06:59 18:39	07:06 16:20	08:13 15:22	08:43 15:20
31	08:06 16:21		06:33 19:36		04:12 21:43		04:50 21:20	05:56 20:03		07:08 16:17		08:43 15:21
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (888)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:12>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (850)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:44	04:11 21:45
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:09 21:47
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	05:01 20:55	04:05 21:52
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:52	04:57 20:57	04:04 21:54
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:52 21:02	04:03 21:56
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 22:00
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:39 21:14	03:59 22:01
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	03:59 22:02
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:14	04:35 21:18	03:59 22:02
18	08:28 15:52	07:25 17:04	06:10 18:08	05:45 20:16	04:33 21:20	03:59 22:03
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:32 21:22	03:59 22:03
20	08:25 15:57	07:20 17:08	06:05 18:12	05:39 20:20	04:30 21:24	03:59 22:04
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:28	03:59 22:04
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:04
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:23 21:32	04:00 22:04
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:04
26	08:15 16:10	07:04 17:22	05:48 18:25	05:24 20:33	04:19 21:36	04:00 22:04
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:18 21:37	04:01 22:04
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04
29	08:10 16:17	06:57 17:32	05:40 18:32	05:17 20:40	04:15 21:41	04:02 22:04
30	08:08 16:19	06:57 17:34	05:40 18:34	05:17 20:42	04:13 21:42	04:03 22:03
31	08:06 16:21	06:54 17:36	05:38 18:36	05:15 20:44	04:12 21:44	04:03 22:03
Potential sun hours	228	263	366	429	515	538
Total, worst case				38	393	409
Sun reduction				0,42	0,53	0,43
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,68	0,69	0,69
Total reduction				0,28	0,36	0,29
Total, real				11	142	119

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (850)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December
1	04:04 22:03	04:44 (B0015) 05:00 (B0015)	04:53 21:18	05:30 (B0011) 05:47 (B0011)	05:58 20:00	07:02 18:37
2	04:05 22:02	04:45 (B0015) 05:00 (B0015)	04:55 21:16	05:31 (B0011) 05:46 (B0011)	06:01 19:58	07:04 18:34
3	04:06 22:02	04:46 (B0015) 05:00 (B0015)	04:57 21:14	05:33 (B0011) 05:45 (B0011)	06:03 19:55	07:06 18:31
4	04:07 22:01	04:46 (B0015) 05:00 (B0015)	04:59 21:12	05:34 (B0011) 05:43 (B0011)	06:05 19:52	07:08 18:28
5	04:08 22:00	04:47 (B0015) 05:00 (B0015)	05:01 21:09		06:07 19:49	07:10 18:26
6	04:09 21:59	04:48 (B0015) 05:00 (B0015)	05:03 21:07		06:09 19:47	07:12 18:23
7	04:10 21:58	04:50 (B0015) 05:01 (B0015)	05:05 21:05	05:55 (B0016) 05:59 (B0016)	06:11 19:44	07:15 18:20
8	04:11 21:57	04:51 (B0015) 05:01 (B0015)	05:07 21:02	05:52 (B0016) 06:00 (B0016)	06:13 19:41	07:17 18:17
9	04:13 21:56	04:52 (B0015) 05:00 (B0015)	05:09 21:00	05:51 (B0016) 06:02 (B0016)	06:15 19:38	07:19 18:15
10	04:14 21:55	04:53 (B0015) 05:00 (B0015)	05:12 20:58	05:50 (B0016) 06:03 (B0016)	06:17 19:35	07:21 18:12
11	04:15 21:54	04:54 (B0015) 05:00 (B0015)	05:14 20:55	05:49 (B0016) 06:03 (B0016)	06:19 19:33	07:23 18:09
12	04:17 21:53	04:56 (B0015) 05:00 (B0015)	05:16 20:53	05:49 (B0016) 06:03 (B0016)	06:22 19:30	07:26 18:06
13	04:18 21:52	04:57 (B0015) 04:59 (B0015)	05:18 20:50	05:51 (B0016) 06:03 (B0016)	06:24 19:27	07:28 18:04
14	04:20 21:50		05:20 20:48	05:53 (B0016) 06:03 (B0016)	06:26 19:24	07:30 18:01
15	04:21 21:49	05:35 (B0011) 05:40 (B0011)	05:22 20:45	05:55 (B0016) 06:02 (B0016)	06:28 19:21	07:32 17:58
16	04:23 21:48	05:33 (B0011) 05:42 (B0011)	05:24 20:43	05:57 (B0016) 06:01 (B0016)	06:30 19:19	07:34 17:56
17	04:25 21:46	05:32 (B0011) 05:44 (B0011)	05:26 20:40	05:59 (B0016) 06:00 (B0016)	06:32 19:16	07:37 17:53
18	04:26 21:44	05:31 (B0011) 05:44 (B0011)	05:29 20:38		06:34 19:13	07:39 17:50
19	04:28 21:43	05:31 (B0011) 05:46 (B0011)	05:31 20:35		06:36 19:10	07:41 17:48
20	04:30 21:41	05:30 (B0011) 05:46 (B0011)	05:33 20:32		06:38 19:07	07:43 17:45
21	04:32 21:40	05:30 (B0011) 05:47 (B0011)	05:35 20:30		06:41 19:05	07:46 17:43
22	04:33 21:38	05:30 (B0011) 05:48 (B0011)	05:37 20:27		06:43 19:02	07:48 17:40
23	04:35 21:36	05:29 (B0011) 05:47 (B0011)	05:39 20:25		06:45 18:59	07:50 17:38
24	04:37 21:34	05:29 (B0011) 05:48 (B0011)	05:41 20:22		06:47 18:56	07:52 17:35
25	04:39 21:32	05:29 (B0011) 05:49 (B0011)	05:44 20:19		06:49 18:53	07:55 16:33
26	04:41 21:30	05:28 (B0011) 05:48 (B0011)	05:46 20:17		06:51 18:51	06:57 16:30
27	04:43 21:28	05:28 (B0011) 05:48 (B0011)	05:48 20:14		06:53 18:48	06:59 16:28
28	04:45 21:26	05:29 (B0011) 05:48 (B0011)	05:50 20:11		06:55 18:45	07:01 16:25
29	04:47 21:24	05:29 (B0011) 05:49 (B0011)	05:52 20:09		06:57 18:42	07:04 16:23
30	04:49 21:22	05:30 (B0011) 05:48 (B0011)	05:54 20:06		07:00 18:39	07:06 16:20
31	04:51 21:20	05:29 (B0011) 05:47 (B0011)	05:56 20:03			07:08 16:18
Potential sun hours	538		474	386	321	241
Total, worst case	409		151			
Sun reduction	0,38		0,35			
Oper. time red.	0,99		0,99			
Wind dir. red.	0,69		0,68			
Total reduction	0,26		0,24			
Total, real	107		36			

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (815)
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:03	04:44 (B0021) 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:47	04:09 21:47	04:05 22:02	04:45 (B0021) 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:45 (B0021) 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:46 (B0021) 21:11	06:05 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:16
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:54	04:10 21:58	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:39 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:09 21:00	06:15 19:38	07:19 18:15	07:29 15:57	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:33	07:23 18:09	07:33 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	03:59 22:02	04:23 21:47	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:43	08:37 15:13
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:25 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:28 15:52	07:25 17:04	06:10 18:08	05:45 20:16	04:33 21:20	03:59 22:03	04:26 21:44	05:29 20:38	06:34 19:13	07:39 17:50	07:49 15:40	08:39 15:13
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:22	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	08:25 15:57	07:20 17:08	06:04 18:12	05:39 20:20	04:30 21:24	03:59 22:04	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:40 15:13
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:39	05:35 20:30	06:40 19:05	07:45 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:31	08:42 15:15
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:22 21:32	04:00 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:04	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:29	08:43 15:16
26	08:15 16:10	07:04 17:22	05:48 18:25	05:24 20:33	04:19 21:35	04:00 22:04	04:41 21:30	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:26	08:43 15:18
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:19
29	08:10 16:17		06:39 19:32	05:16 20:40	04:15 21:41	04:02 22:03	04:47 21:24	05:52 20:08	06:57 18:42	07:04 16:23	08:12 15:23	08:43 15:20
30	08:08 16:19		06:37 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:49 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:43 15:21
31	08:06 16:21		06:34 19:36		04:12 21:44		04:51 21:20	05:56 20:03		07:08 16:18		08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
Total, worst case						103						
Sun reduction						0,43						
Oper. time red.						0,99						
Wind dir. red.						0,69						
Total reduction						0,29						
Total, real						30						

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (851)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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	08:04	06:57	06:31	05:11	04:11	04:47 (B0016)	04:04	04:44 (B0016)	04:53	05:58	07:02	07:11	08:16		
	15:23	16:24	17:29	19:38	20:44	21:45	6	04:53 (B0016)	22:03	17	05:01 (B0016)	21:18	20:00	18:37	16:15	15:21
2	08:43	08:02	06:54	06:28	05:09	04:09	04:46 (B0016)	04:05	04:45 (B0016)	04:55	06:00	07:04	07:13	08:18		
	15:25	16:26	17:32	19:40	20:47	21:47	8	04:54 (B0016)	22:02	17	05:02 (B0016)	21:16	19:58	18:34	16:13	15:20
3	08:42	08:00	06:51	06:25	05:06	04:08	04:45 (B0016)	04:06	04:46 (B0016)	04:57	06:03	07:06	07:15	08:19		
	15:26	16:28	17:34	19:43	20:49	21:48	9	04:54 (B0016)	22:01	16	05:02 (B0016)	21:14	19:55	18:31	16:11	15:19
4	08:42	07:58	06:48	06:23	05:04	04:07	04:44 (B0016)	04:07	04:46 (B0016)	04:59	06:05	07:08	07:17	08:21		
	15:27	16:31	17:36	19:45	20:51	21:50	10	04:54 (B0016)	22:01	15	05:01 (B0016)	21:11	19:52	18:28	16:08	15:18
5	08:41	07:55	06:46	06:20	05:02	04:06	04:43 (B0016)	04:08	04:47 (B0016)	05:01	06:07	07:10	07:20	08:23		
	15:29	16:33	17:38	19:47	20:53	21:51	12	04:55 (B0016)	22:00	14	05:01 (B0016)	21:09	19:49	18:26	16:06	15:17
6	08:41	07:53	06:43	06:17	04:59	04:05	04:43 (B0016)	04:09	04:48 (B0016)	05:03	06:09	07:12	07:22	08:24		
	15:30	16:35	17:41	19:49	20:55	21:52	13	04:56 (B0016)	21:59	13	05:01 (B0016)	21:07	19:47	18:23	16:04	15:16
7	08:40	07:51	06:40	06:14	04:57	04:04	04:42 (B0016)	04:10	04:50 (B0016)	05:05	06:11	07:15	07:24	08:26		
	15:32	16:38	17:43	19:51	20:57	21:54	14	04:56 (B0016)	21:58	12	05:02 (B0016)	21:05	19:44	18:20	16:02	15:16
8	08:39	07:49	06:38	06:12	04:55	04:03	04:41 (B0016)	04:11	04:51 (B0016)	05:07	06:13	07:17	07:27	08:27		
	15:34	16:40	17:45	19:54	21:00	21:55	15	04:56 (B0016)	21:57	11	05:02 (B0016)	21:02	19:41	18:17	16:00	15:15
9	08:39	07:47	06:35	06:09	04:52	04:03	04:41 (B0016)	04:13	04:52 (B0016)	05:09	06:15	07:19	07:29	08:29		
	15:35	16:43	17:47	19:56	21:02	21:56	15	04:56 (B0016)	21:56	10	05:02 (B0016)	21:00	19:38	18:15	15:57	15:15
10	08:38	07:44	06:32	06:06	04:50	04:02	04:40 (B0016)	04:14	04:53 (B0016)	05:12	06:17	07:21	07:31	08:30		
	15:37	16:45	17:50	19:58	21:04	21:57	16	04:56 (B0016)	21:55	8	05:01 (B0016)	20:57	19:35	18:12	15:55	15:14
11	08:37	07:42	06:29	06:03	04:48	04:01	04:40 (B0016)	04:15	04:54 (B0016)	05:14	06:19	07:23	07:34	08:32		
	15:39	16:47	17:52	20:00	21:06	21:58	17	04:57 (B0016)	21:54	7	05:01 (B0016)	20:55	19:33	18:09	15:53	15:14
12	08:36	07:40	06:27	06:01	04:46	04:01	04:39 (B0016)	04:17	04:56 (B0016)	05:16	06:22	07:26	07:36	08:33		
	15:41	16:50	17:54	20:02	21:08	21:59	18	04:57 (B0016)	21:53	5	05:01 (B0016)	20:53	19:30	18:06	15:51	15:13
13	08:35	07:37	06:24	05:58	04:44	04:00	04:40 (B0016)	04:18	04:57 (B0016)	05:18	06:24	07:28	07:38	08:34		
	15:42	16:52	17:56	20:05	21:10	22:00	17	04:57 (B0016)	21:52	4	05:01 (B0016)	20:50	19:27	18:04	15:49	15:13
14	08:33	07:35	06:21	05:55	04:42	04:00	04:40 (B0016)	04:20	04:58 (B0016)	05:20	06:26	07:30	07:40	08:35		
	15:44	16:54	17:59	20:07	21:12	22:00	18	04:58 (B0016)	21:50	2	05:00 (B0016)	20:48	19:24	18:01	15:47	15:13
15	08:32	07:32	06:18	05:53	04:39	03:59	04:41 (B0016)	04:21	05:22	06:28	07:32	07:43	08:36			
	15:46	16:57	18:01	20:09	21:14	22:01	17	04:58 (B0016)	21:49	20:45	19:21	17:58	15:45	15:13		
16	08:31	07:30	06:16	05:50	04:37	03:59	04:41 (B0016)	04:23	05:24	06:30	07:34	07:45	08:37			
	15:48	16:59	18:03	20:11	21:16	22:02	17	04:58 (B0016)	21:47	20:43	19:19	17:56	15:43	15:13		
17	08:30	07:27	06:13	05:47	04:35	03:59	04:40 (B0016)	04:25	05:26	06:32	07:37	07:47	08:38			
	15:50	17:01	18:05	20:13	21:18	22:02	18	04:58 (B0016)	21:46	20:40	19:16	17:53	15:42	15:13		
18	08:28	07:25	06:10	05:45	04:33	03:59	04:41 (B0016)	04:26	05:29	06:34	07:39	07:49	08:39			
	15:52	17:04	18:08	20:16	21:20	22:03	17	04:58 (B0016)	21:44	20:38	19:13	17:50	15:40	15:13		
19	08:27	07:22	06:07	05:42	04:31	03:59	04:41 (B0016)	04:28	05:31	06:36	07:41	07:51	08:40			
	15:54	17:06	18:10	20:18	21:22	22:03	17	04:58 (B0016)	21:43	20:35	19:10	17:48	15:38	15:13		
20	08:25	07:20	06:04	05:39	04:30	03:59	04:42 (B0016)	04:30	05:33	06:38	07:43	07:54	08:41			
	15:57	17:08	18:12	20:20	21:24	22:04	17	04:59 (B0016)	21:41	20:32	19:07	17:45	15:36	15:13		
21	08:24	07:17	06:02	05:37	04:28	03:59	04:42 (B0016)	04:32	05:35	06:40	07:46	07:56	08:41			
	15:59	17:11	18:14	20:22	21:26	22:04	17	04:59 (B0016)	21:39	20:30	19:05	17:43	15:35	15:14		
22	08:22	07:15	05:59	05:34	04:26	03:59	04:42 (B0016)	04:33	05:37	06:43	07:48	07:58	08:42			
	16:01	17:13	18:16	20:24	21:28	22:04	17	04:59 (B0016)	21:38	20:27	19:02	17:40	15:33	15:14		
23	08:21	07:12	05:56	05:31	04:24	03:59	04:42 (B0016)	04:35	05:39	06:45	07:50	08:00	08:42			
	16:03	17:15	18:19	20:27	21:30	22:04	17	04:59 (B0016)	21:36	20:25	18:59	17:38	15:32	15:15		
24	08:19	07:10	05:53	05:29	04:23	04:00	04:43 (B0016)	04:37	05:41	06:47	07:52	08:02	08:43			
	16:05	17:18	18:21	20:29	21:32	22:04	17	05:00 (B0016)	21:34	20:22	18:56	17:35	15:30	15:15		
25	08:17	07:07	05:51	05:26	04:21	04:00	04:43 (B0016)	04:39	05:43	06:49	06:55	08:04	08:43			
	16:08	17:20	18:23	20:31	21:34	22:04	17	05:00 (B0016)	21:32	20:19	18:53	16:32	15:29	15:16		
26	08:15	07:04	05:48	05:24	04:19	04:00	04:43 (B0016)	04:41	05:46	06:51	06:57	08:06	08:43			
	16:10	17:22	18:25	20:33	21:35	22:04	17	05:00 (B0016)	21:30	20:17	18:51	16:30	15:27	15:17		
27	08:14	07:02	05:45	05:21	04:18	04:01	04:43 (B0016)	04:43	05:48	06:53	06:59	08:08	08:43			
	16:12	17:25	18:27	20:36	21:37	22:04	17	05:00 (B0016)	21:28	20:14	18:48	16:28	15:26	15:18		
28	08:12	06:59	05:42	05:19	04:16	04:02	04:44 (B0016)	04:45	05:50	06:55	07:01	08:10	08:43			
	16:14	17:27	18:30	20:38	21:39	22:04	17	05:01 (B0016)	21:26	20:11	18:45	16:25	15:25	15:19		
29	08:10	06:59	05:42	05:19	04:16	04:02	04:43 (B0016)	04:47	05:52	06:57	07:04	08:12	08:44			
	16:17	19:32	20:40	21:41		22:03	17	05:00 (B0016)	21:24	20:09	18:42	16:23	15:23	15:20		
30	08:08	06:37	05:14	04:13		04:03	04:44 (B0016)	04:49	05:54	07:00	07:06	08:14	08:43			
	16:19	19:34	20:42	21:42	3	04:52 (B0016)	22:03	17	05:01 (B0016)	21:22	20:06	18:39	16:20	15:22	15:21	
31	08:06	06:34	05:11	04:12		04:48 (B0016)			04:51	05:56	07:08					
	16:21	19:36	20:44	21:44	5	04:53 (B0016)			21:20	20:03	16:18					
Potential sun hours	228	263	366	429	515	538		538		474	386	321	241	207		
Total, worst case					8	461		151								
Sun reduction					0,53	0,43		0,38								
Oper. time red.					0,99	0,99		0,99								
Wind dir. red.					0,69	0,69		0,69								
Total reduction					0,36	0,29		0,26								
Total, real					3	134		40								

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: HASSLEÅS 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (852)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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	08:04	06:56	06:31	05:11	04:11	04:04	04:53	05:58	07:02	07:11	08:16
	15:23	16:24	17:29	19:38	20:44	21:45	22:03	21:18	20:00	18:37	16:15	15:21
2	08:43	08:02	06:54	06:28	05:09	04:09	04:05	04:55	06:00	07:04	07:13	08:17
	15:25	16:26	17:32	19:40	20:46	21:47	22:02	21:16	19:58	18:34	16:13	15:20
3	08:42	08:00	06:51	06:25	05:06	04:08	04:06	04:57	06:03	07:06	07:15	08:19
	15:26	16:28	17:34	19:43	20:49	21:48	22:01	21:14	19:55	18:31	16:11	15:19
4	08:42	07:58	06:48	06:23	05:04	04:07	04:07	04:59	06:05	07:08	07:17	08:21
	15:27	16:31	17:36	19:45	20:51	21:50	22:01	21:11	19:52	18:28	16:08	15:18
5	08:41	07:55	06:46	06:20	05:02	04:06	04:08	05:01	06:07	07:10	07:20	08:23
	15:29	16:33	17:38	19:47	20:53	21:51	22:00	21:09	19:49	18:25	16:06	15:17
6	08:41	07:53	06:43	06:17	04:59	04:05	04:09	05:03	06:09	07:12	07:22	08:24
	15:30	16:35	17:41	19:49	20:55	21:52	21:59	21:07	19:47	18:23	16:04	15:16
7	08:40	07:51	06:40	06:14	04:57	04:04	04:10	05:05	06:11	07:15	07:24	08:26
	15:32	16:38	17:43	19:51	20:57	21:53	21:58	21:05	19:44	18:20	16:02	15:16
8	08:39	07:49	06:38	06:12	04:55	04:03	04:11	05:07	06:13	07:17	07:27	08:27
	15:34	16:40	17:45	19:54	21:00	21:55	21:57	21:02	19:41	18:17	16:00	15:15
9	08:39	07:46	06:35	06:09	04:52	04:03	04:13	05:09	06:15	07:19	07:29	08:29
	15:35	16:42	17:47	19:56	21:02	21:56	21:56	21:00	19:38	18:15	15:57	15:15
10	08:38	07:44	06:32	06:06	04:50	04:02	04:14	05:12	06:17	07:21	07:31	08:30
	15:37	16:45	17:50	19:58	21:04	21:57	21:55	20:57	19:35	18:12	15:55	15:14
11	08:37	07:42	06:29	06:03	04:48	04:01	04:15	05:14	06:19	07:23	07:33	08:31
	15:39	16:47	17:52	20:00	21:06	21:58	21:54	20:55	19:33	18:09	15:53	15:14
12	08:36	07:39	06:27	06:01	04:46	04:01	04:17	05:16	06:22	07:25	07:36	08:33
	15:41	16:50	17:54	20:02	21:08	21:59	21:53	20:53	19:30	18:06	15:51	15:13
13	08:35	07:37	06:24	05:58	04:44	04:00	04:18	05:18	06:24	07:28	07:38	08:34
	15:42	16:52	17:56	20:05	21:10	22:00	21:52	20:50	19:27	18:04	15:49	15:13
14	08:33	07:35	06:21	05:55	04:41	04:00	04:20	05:20	06:26	07:30	07:40	08:35
	15:44	16:54	17:59	20:07	21:12	22:00	21:50	20:48	19:24	18:01	15:47	15:13
15	08:32	07:32	06:18	05:53	04:39	03:59	04:21	05:22	06:28	07:32	07:42	08:36
	15:46	16:57	18:01	20:09	21:14	22:01	21:49	20:45	19:21	17:58	15:45	15:13
16	08:31	07:30	06:16	05:50	04:37	03:59	04:23	05:24	06:30	07:34	07:45	08:37
	15:48	16:59	18:03	20:11	21:16	22:02	21:47	20:43	19:19	17:56	15:43	15:13
17	08:30	07:27	06:13	05:47	04:35	03:59	04:25	05:26	06:32	07:37	07:47	08:38
	15:50	17:01	18:05	20:13	21:18	22:02	21:46	20:40	19:16	17:53	15:42	15:13
18	08:28	07:25	06:10	05:45	04:33	03:59	04:26	05:29	06:34	07:39	07:49	08:39
	15:52	17:04	18:08	20:16	21:20	22:03	21:44	20:38	19:13	17:50	15:40	15:13
19	08:27	07:22	06:07	05:42	04:31	03:59	04:28	05:31	06:36	07:41	07:51	08:40
	15:54	17:06	18:10	20:18	21:22	22:03	21:43	20:35	19:10	17:48	15:38	15:13
20	08:25	07:20	06:04	05:39	04:30	03:59	04:30	05:33	06:38	07:43	07:53	08:40
	15:57	17:08	18:12	20:20	21:24	22:04	21:41	20:32	19:07	17:45	15:36	15:13
21	08:24	07:17	06:02	05:37	04:28	03:59	04:32	05:35	06:40	07:45	07:56	08:41
	15:59	17:11	18:14	20:22	21:26	22:04	21:39	20:30	19:05	17:43	15:35	15:14
22	08:22	07:15	05:59	05:34	04:26	03:59	04:33	05:37	06:43	07:48	07:58	08:42
	16:01	17:13	18:16	20:24	21:28	22:04	21:38	20:27	19:02	17:40	15:33	15:14
23	08:21	07:12	05:56	05:31	04:24	03:59	04:35	05:39	06:45	07:50	08:00	08:42
	16:03	17:15	18:19	20:27	21:30	22:04	21:36	20:25	18:59	17:38	15:31	15:15
24	08:19	07:10	05:53	05:29	04:22	04:00	04:37	05:41	06:47	07:52	08:02	08:43
	16:05	17:18	18:21	20:29	21:32	22:04	21:34	20:22	18:56	17:35	15:30	15:15
25	08:17	07:07	05:50	05:26	04:21	04:00	04:39	05:43	06:49	06:55	08:04	08:43
	16:08	17:20	18:23	20:31	21:34	22:04	21:32	20:19	18:53	16:32	15:29	15:16
26	08:15	07:04	05:48	05:24	04:19	04:00	04:41	05:46	06:51	06:57	08:06	08:43
	16:10	17:22	18:25	20:33	21:35	22:04	21:30	20:17	18:51	16:30	15:27	15:17
27	08:14	07:02	05:45	05:21	04:18	04:01	04:43	05:48	06:53	06:59	08:08	08:43
	16:12	17:25	18:27	20:35	21:37	22:04	21:28	20:14	18:48	16:27	15:26	15:18
28	08:12	06:59	05:42	05:19	04:16	04:02	04:45	05:50	06:55	07:01	08:10	08:43
	16:14	17:27	18:29	20:38	21:39	22:04	21:26	20:11	18:45	16:25	15:24	15:19
29	08:10		06:39	05:16	04:15	04:02	04:47	05:52	06:57	07:04	08:12	08:43
	16:17		19:32	20:40	21:41	22:03	21:24	20:08	18:42	16:23	15:23	15:20
30	08:08		06:37	05:14	04:13	04:03	04:49	05:54	07:00	07:06	08:14	08:43
	16:19		19:34	20:42	21:42	22:03	21:22	20:06	18:39	16:20	15:22	15:21
31	08:06		06:34		04:12		04:51	05:56		07:08		08:43
	16:21		19:36		21:44		21:20	20:03		16:18		15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (859)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47
3	08:42 15:25	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49
5	08:41 15:28	07:55 16:33	06:45 17:38	06:20 19:47	05:01 20:53	04:06 21:51
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52
7	08:40 15:31	07:51 16:37	06:40 17:43	17:06 (B0023) 17:13 (B0023)	06:14 19:51	04:04 20:57
8	08:39 15:33	07:49 16:40	06:37 17:45	17:05 (B0023) 17:15 (B0023)	06:11 19:53	04:03 20:59
9	08:38 15:35	07:46 16:42	06:35 17:47	17:03 (B0023) 17:16 (B0023)	06:09 19:56	04:02 21:01
10	08:37 15:37	07:44 16:44	06:32 17:49	17:03 (B0023) 17:16 (B0023)	06:06 19:58	04:00 21:04
11	08:36 15:38	07:42 16:47	06:29 17:52	17:03 (B0023) 17:17 (B0023)	06:03 20:00	04:01 21:06
12	08:35 15:40	07:39 16:49	06:26 17:54	17:03 (B0023) 17:16 (B0023)	06:00 20:02	04:00 21:08
13	08:34 15:42	07:37 16:52	06:24 17:56	17:04 (B0023) 17:14 (B0023)	05:58 20:04	04:00 21:10
14	08:33 15:44	07:34 16:54	06:21 17:58	17:06 (B0023) 17:12 (B0023)	05:55 20:07	04:01 21:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	03:59 22:02
17	08:29 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:58 22:02
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03
19	08:27 15:54	07:22 17:06	06:07 18:09	05:42 20:18	04:31 21:22	03:58 22:03
20	08:25 15:56	07:20 17:08	16:30 (B0024) 16:35 (B0024)	06:04 20:20	04:29 21:24	03:58 22:03
21	08:24 15:58	07:17 17:10	16:27 (B0024) 16:37 (B0024)	06:01 20:22	04:27 21:26	03:58 22:04
22	08:22 16:00	07:15 17:13	16:27 (B0024) 16:39 (B0024)	05:59 20:24	04:26 21:28	03:59 22:04
23	08:20 16:03	07:12 17:15	16:26 (B0024) 16:39 (B0024)	05:56 20:26	04:24 21:30	03:59 22:04
24	08:19 16:05	07:09 17:17	16:25 (B0024) 16:39 (B0024)	05:53 20:29	04:22 21:32	03:59 22:04
25	08:17 16:07	07:07 17:20	16:26 (B0024) 16:40 (B0024)	05:50 20:31	04:20 21:33	04:00 22:04
26	08:15 16:09	07:04 17:22	16:26 (B0024) 16:39 (B0024)	05:47 20:33	04:19 21:35	04:00 22:04
27	08:13 16:12	07:02 17:24	16:26 (B0024) 16:38 (B0024)	05:45 20:35	04:17 21:37	04:01 22:04
28	08:11 16:14	06:59 17:27	16:27 (B0024) 16:36 (B0024)	05:42 20:37	04:16 21:39	04:01 22:04
29	08:10 16:16		06:39 19:31	05:16 20:40	04:14 21:40	04:02 22:03
30	08:08 16:19		06:36 19:34	05:13 20:42	04:13 21:42	04:03 22:03
31	08:06 16:21		06:33 19:36		04:12 21:44	
Potential sun hours	228	263	366	429	515	539
Total, worst case		102	86			
Sun reduction		0,16	0,22			
Oper. time red.		0,99	0,99			
Wind dir. red.		0,69	0,65			
Total reduction		0,11	0,14			
Total, real		11	12			

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (859)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:02	04:52 21:18	05:58 20:00	07:01 18:36	17:43 (B0023) 17:55 (B0023)	07:10 16:15
2	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	17:42 (B0023) 17:55 (B0023)	07:13 16:13
3	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	17:41 (B0023) 17:54 (B0023)	07:15 16:10
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:40 (B0023) 17:54 (B0023)	07:17 16:08
5	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	17:41 (B0023) 17:53 (B0023)	07:19 16:06
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	17:42 (B0023) 17:51 (B0023)	07:22 16:04
7	04:10 21:58	05:05 21:04	06:11 19:43	07:14 18:20	17:43 (B0023) 17:48 (B0023)	07:24 16:01
8	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17		07:26 15:59
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14		07:29 15:57
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11		07:31 15:55
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09		07:33 15:53
12	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06		07:36 15:51
13	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	17:03 (B0024) 17:08 (B0024)	07:38 15:49
14	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	5 17:00 (B0024) 9 17:09 (B0024)	07:40 15:47
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:58 (B0024) 12 17:10 (B0024)	07:42 15:45
16	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	16:58 (B0024) 13 17:11 (B0024)	07:45 15:43
17	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	16:57 (B0024) 14 17:11 (B0024)	07:47 15:41
18	04:26 21:44	05:28 20:37	06:34 19:13	07:38 17:50	16:57 (B0024) 14 17:11 (B0024)	07:49 15:39
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:47	16:57 (B0024) 13 17:10 (B0024)	07:51 15:38
20	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	16:57 (B0024) 12 17:09 (B0024)	07:53 15:36
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	16:59 (B0024) 8 17:07 (B0024)	07:55 15:34
22	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40		07:58 15:33
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37		08:00 15:31
24	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35		08:02 15:30
25	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32		08:04 15:28
26	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30		08:06 15:27
27	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27		08:08 15:25
28	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25		08:10 15:24
29	04:46 21:24	05:52 20:08	06:57 18:42	17:47 (B0023) 4 17:51 (B0023)	07:03 16:22	08:12 15:23
30	04:48 21:22	05:54 20:05	06:59 18:39	17:45 (B0023) 9 17:54 (B0023)	07:06 16:20	08:14 15:22
31	04:50 21:20	05:56 20:03		07:08 16:17		08:16 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case			13	178		
Sun reduction			0,31	0,26		
Oper. time red.			0,99	0,99		
Wind dir. red.			0,65	0,67		
Total reduction			0,20	0,17		
Total, real			3	31		

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (905)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23 20	15:00 (B0024) 15:20 (B0024) 17:29	06:31 19:38 7	19:02 (B0020) 19:09 (B0020) 20:44	04:10 21:45
2	08:43 15:24	08:02 16:26 19	15:01 (B0024) 15:20 (B0024) 17:31	06:28 19:40 10	19:01 (B0020) 19:11 (B0020) 20:46	04:09 21:47
3	08:42 15:26	08:00 16:28 18	15:01 (B0024) 15:19 (B0024) 17:34	06:25 19:42 13	19:00 (B0020) 19:13 (B0020) 20:49	04:08 21:48
4	08:42 15:27	07:57 16:30 17	15:02 (B0024) 15:19 (B0024) 17:36	06:22 19:45 14	18:59 (B0020) 19:13 (B0020) 20:51	04:07 21:50
5	08:41 15:28	07:55 16:33 14	15:04 (B0024) 15:18 (B0024) 17:38	06:20 19:47 13	19:00 (B0020) 19:13 (B0020) 20:53	04:06 21:51
6	08:41 15:30	07:53 16:35 10	15:06 (B0024) 15:16 (B0024) 17:40	06:17 19:49 12	19:00 (B0020) 19:12 (B0020) 20:55	04:05 21:52
7	08:40 15:32	07:51 16:37 3	15:10 (B0024) 15:13 (B0024) 17:43	06:14 19:51 10	19:00 (B0020) 19:10 (B0020) 20:57	04:04 21:53
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53 6	19:03 (B0020) 19:09 (B0020) 20:59	04:03 21:55
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56
10	08:38 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	20:32 (B0018) 20:34 (B0018) 21:59
14	08:33 15:44	07:35 16:54 8	16:10 (B0023) 16:18 (B0023) 17:58	05:55 20:07	04:41 21:12	20:31 (B0018) 20:36 (B0018) 22:00
15	08:32 15:46	07:32 16:56 13	16:07 (B0023) 16:20 (B0023) 18:01	05:52 20:09	04:39 21:14	20:30 (B0018) 20:38 (B0018) 22:01
16	08:31 15:48	07:30 16:59 17	16:06 (B0023) 16:23 (B0023) 18:03	05:50 20:11	04:37 21:16	20:30 (B0018) 20:39 (B0018) 22:02
17	08:30 15:50	07:27 17:01 18	16:05 (B0023) 16:23 (B0023) 18:05	17:33 (B0021) 17:36 (B0021) 20:13	05:47 21:18	20:29 (B0018) 20:41 (B0018) 22:02
18	08:28 15:52	07:25 17:03 20	16:04 (B0023) 16:24 (B0023) 18:07	17:31 (B0021) 17:38 (B0021) 20:15	05:44 21:20	20:30 (B0018) 20:43 (B0018) 22:03
19	08:27 15:54	07:22 17:06 21	16:04 (B0023) 16:25 (B0023) 18:09	17:29 (B0021) 17:40 (B0021) 20:18	05:42 21:22	20:30 (B0018) 20:44 (B0018) 22:03
20	08:25 15:56 5	07:20 15:04 (B0024) 15:09 (B0024) 17:08	16:03 (B0023) 16:25 (B0023) 18:12	17:28 (B0021) 17:42 (B0021) 20:20	05:39 21:24	20:30 (B0018) 20:43 (B0018) 22:03
21	08:24 15:58 10	07:17 15:12 (B0024) 15:17 (B0024) 17:10	16:03 (B0023) 16:24 (B0023) 18:14	17:27 (B0021) 17:42 (B0021) 20:22	05:36 21:26	20:31 (B0018) 20:44 (B0018) 22:04
22	08:22 16:01 13	07:15 15:00 (B0024) 15:13 (B0024) 17:13	16:03 (B0023) 16:25 (B0023) 18:16	17:28 (B0021) 17:43 (B0021) 20:24	05:34 21:28	20:31 (B0018) 20:43 (B0018) 22:04
23	08:20 16:03 15	07:12 15:01 (B0024) 15:16 (B0024) 17:15	16:03 (B0023) 16:24 (B0023) 18:18	17:28 (B0021) 17:42 (B0021) 20:26	05:31 21:30	20:32 (B0018) 20:43 (B0018) 22:04
24	08:19 16:05 17	07:09 14:59 (B0024) 15:17 (B0024) 17:17	16:04 (B0023) 16:23 (B0023) 18:20	17:28 (B0021) 17:41 (B0021) 20:29	05:28 21:32	20:33 (B0018) 20:41 (B0018) 22:04
25	08:17 16:07 18	07:07 14:59 (B0024) 15:17 (B0024) 17:20	16:05 (B0023) 16:23 (B0023) 18:23	17:30 (B0021) 17:39 (B0021) 20:31	05:26 21:34	20:35 (B0018) 20:40 (B0018) 22:04
26	08:15 16:09 19	07:04 14:59 (B0024) 15:18 (B0024) 17:22	16:06 (B0023) 16:21 (B0023) 18:25	05:23 20:33	04:19 21:35	04:00 22:04
27	08:13 16:12 20	07:02 14:59 (B0024) 15:19 (B0024) 17:24	16:08 (B0023) 16:19 (B0023) 18:27	05:21 20:35	04:17 21:37	04:01 22:04
28	08:12 16:14 20	06:59 14:59 (B0024) 15:19 (B0024) 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04
29	08:10 16:16 21	06:59 14:59 (B0024) 15:20 (B0024)	05:42 19:31	05:16 20:40	04:14 21:40	04:02 22:03
30	08:08 16:19 21	06:59 14:59 (B0024) 15:20 (B0024)	06:36 19:34	05:13 20:42	04:13 21:42	04:03 22:03
31	08:06 16:21 21	06:59 14:59 (B0024) 15:20 (B0024)	06:33 19:36	19:04 (B0020) 19:06 (B0020)	04:12 21:44	
Potential sun hours	228	263	366	429	515	539
Total, worst case	200	347	103	85	125	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,69	0,66	0,64	0,59	
Total reduction	0,13	0,11	0,15	0,27	0,32	
Total, real	26	39	15	23	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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (905)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July		August		September		October		November		December	
1	04:03		04:52		05:58		07:01		07:10		08:16	
	22:02		21:18		20:00		18:36		16:15		15:21	
2	04:04		04:55		06:00		07:04		07:13		08:17	
	22:02		21:16		19:57		18:34		16:13		15:20	
3	04:05		04:57		06:02		07:06		07:15		08:19	
	22:01		21:13		19:55		18:31		16:10		15:19	
4	04:06		04:59		06:04	19:00 (B0020)	07:08		07:17	14:39 (B0024)	08:21	
	22:01		21:11		19:52	6 19:06 (B0020)	18:28		16:08	4 14:43 (B0024)	15:18	
5	04:07		05:01		06:07	18:57 (B0020)	07:10		07:20		14:35 (B0024)	08:22
	22:00		21:09		19:49	10 19:07 (B0020)	18:25		16:06	11 14:46 (B0024)	15:17	
6	04:08		05:03		06:09	18:56 (B0020)	07:12		07:22		14:34 (B0024)	08:24
	21:59		21:07		19:46	12 19:08 (B0020)	18:22		16:04	14 14:48 (B0024)	15:16	
7	04:10		05:05		06:11	18:55 (B0020)	07:14		07:24		14:32 (B0024)	08:26
	21:58		21:04		19:44	13 19:08 (B0020)	18:20		16:01	17 14:49 (B0024)	15:15	
8	04:11		05:07		06:13	18:54 (B0020)	07:17		07:26		14:31 (B0024)	08:27
	21:57		21:02		19:41	14 19:08 (B0020)	18:17		15:59	19 14:50 (B0024)	15:15	
9	04:12		05:09		06:15	18:54 (B0020)	07:19		07:29		14:31 (B0024)	08:29
	21:56		21:00		19:38	13 19:07 (B0020)	18:14		15:57	20 14:51 (B0024)	15:14	
10	04:14		05:11		06:17	18:54 (B0020)	07:21		07:31		14:30 (B0024)	08:30
	21:55		20:57		19:35	10 19:04 (B0020)	18:12		15:55	21 14:51 (B0024)	15:14	
11	04:15		05:13		06:19	18:54 (B0020)	07:23		07:33		14:31 (B0024)	08:31
	21:54		20:55		19:32	7 19:01 (B0020)	18:09		15:53	21 14:52 (B0024)	15:13	
12	04:16		05:15		06:21	18:56 (B0020)	07:25		07:36		14:30 (B0024)	08:33
	21:53		20:52		19:30	3 18:59 (B0020)	18:06		15:51	21 14:51 (B0024)	15:13	
13	04:18		05:18		06:23		07:27		07:38		14:31 (B0024)	08:34
	21:51		20:50		19:27		18:03		15:49	21 14:52 (B0024)	15:13	
14	04:19		05:20		06:25		07:30	16:43 (B0023)	07:40		14:31 (B0024)	08:35
	21:50		20:47		19:24		18:01	7 16:50 (B0023)	15:47	20 14:51 (B0024)	15:13	
15	04:21		05:22		06:28		07:32		07:42		14:31 (B0024)	08:36
	21:49		20:45		19:21		17:58	13 16:52 (B0023)	15:45	21 14:52 (B0024)	15:12	
16	04:23		05:24		06:30		07:34		07:45		14:31 (B0024)	08:37
	21:47		20:42		19:18		17:55	16 16:54 (B0023)	15:43	20 14:51 (B0024)	15:12	
17	04:24		05:26		06:32		07:36		07:47		14:33 (B0024)	08:38
	21:46		20:40		19:16		17:53	18 16:54 (B0023)	15:41	18 14:51 (B0024)	15:12	
18	04:26	20:46 (B0018)	05:28	06:34	18:18 (B0021)	07:39		07:49			14:33 (B0024)	08:39
	21:44	3 20:49 (B0018)	20:37	19:13	8 18:26 (B0021)	17:50	20 16:56 (B0023)	15:39	17 14:50 (B0024)		15:13	
19	04:28		20:43 (B0018)	05:30	06:36	18:15 (B0021)	07:41		07:51		14:35 (B0024)	08:40
	21:43	7 20:50 (B0018)	20:35	19:10	12 18:27 (B0021)	17:48	21 16:55 (B0023)	15:38	15 14:50 (B0024)		15:13	
20	04:29		20:43 (B0018)	05:33	06:38	18:14 (B0021)	07:43		07:53		14:35 (B0024)	08:40
	21:41	9 20:52 (B0018)	20:32	19:07	13 18:27 (B0021)	17:45	21 16:55 (B0023)	15:36	13 14:48 (B0024)		15:13	
21	04:31		20:42 (B0018)	05:35	06:40	18:14 (B0021)	07:45		07:56		14:38 (B0024)	08:41
	21:39	11 20:53 (B0018)	20:30	19:04	14 18:28 (B0021)	17:42	22 16:56 (B0023)	15:34	10 14:48 (B0024)		15:13	
22	04:33		20:41 (B0018)	05:37	06:42	18:13 (B0021)	07:48		07:58		14:40 (B0024)	08:42
	21:38	12 20:53 (B0018)	20:27	19:02	15 18:28 (B0021)	17:40	22 16:55 (B0023)	15:33	5 14:45 (B0024)		15:14	
23	04:35		20:41 (B0018)	05:39	06:44	18:13 (B0021)	07:50		08:00			08:42
	21:36	13 20:54 (B0018)	20:24	18:59	14 18:27 (B0021)	17:37	21 16:55 (B0023)	15:31			15:14	
24	04:37		20:41 (B0018)	05:41	06:47	18:13 (B0021)	07:52		08:02			08:42
	21:34	14 20:55 (B0018)	20:22	18:56	12 18:25 (B0021)	17:35	20 16:54 (B0023)	15:30			15:15	
25	04:39		20:40 (B0018)	05:43	06:49	18:13 (B0021)	06:54		08:04			08:43
	21:32	14 20:54 (B0018)	20:19	18:53	9 18:22 (B0021)	16:32	18 15:53 (B0023)	15:28			15:16	
26	04:41		20:40 (B0018)	05:45	06:51	18:14 (B0021)	06:57		08:06			08:43
	21:30	13 20:53 (B0018)	20:16	18:50	5 18:19 (B0021)	16:30	16 15:52 (B0023)	15:27			15:16	
27	04:42		20:41 (B0018)	05:47	06:53		06:59		08:08			08:43
	21:28	10 20:51 (B0018)	20:14	18:47		16:27	12 15:50 (B0023)	15:25			15:17	
28	04:44		20:41 (B0018)	05:50	06:55		07:01		08:10			08:43
	21:26	9 20:50 (B0018)	20:11	18:45		16:25	7 15:47 (B0023)	15:24			15:18	
29	04:46		20:41 (B0018)	05:52	06:57		07:03		08:12			08:43
	21:24	6 20:47 (B0018)	20:08	18:42		16:22		15:23			15:19	
30	04:48		20:41 (B0018)	05:54	06:59		07:06		08:14			08:43
	21:22	4 20:45 (B0018)	20:06	18:39		16:20		15:22			15:20	
31	04:50		20:42 (B0018)	05:56		07:08					08:43	
	21:20	2 20:44 (B0018)	20:03			16:17					15:21	
Potential sun hours	538		474		386		321		241		207	
Total, worst case	127				190		254		308			
Sun reduction	0,38				0,31		0,26		0,17			
Oper. time red.	0,99				0,99		0,99		0,99			
Wind dir. red.	0,59				0,65		0,69		0,69			
Total reduction	0,23				0,20		0,18		0,12			
Total, real	29				39		46		37			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (857)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23 20	15:08 (B0024) 15:28 (B0024) 17:29	06:31 19:38 8	19:01 (B0020) 19:09 (B0020) 20:44	04:10 21:45
2	08:43 15:24	08:02 16:26 19	15:09 (B0024) 15:28 (B0024) 17:31	06:28 19:40 11	05:08 19:11 (B0020) 20:46	04:09 21:47
3	08:42 15:26	08:00 16:28 18	15:09 (B0024) 15:27 (B0024) 17:34	06:25 19:42 14	05:06 18:59 (B0020) 20:49	04:08 21:48
4	08:42 15:27	07:57 16:30 17	15:10 (B0024) 15:27 (B0024) 17:36	06:22 19:45 13	05:04 18:59 (B0020) 20:51	04:07 21:50
5	08:41 15:28	07:55 16:33 15	15:12 (B0024) 15:27 (B0024) 17:38	06:20 19:47 11	05:01 19:00 (B0020) 20:53	04:06 21:51
6	08:41 15:30	07:53 16:35 12	15:13 (B0024) 15:25 (B0024) 17:40	06:17 19:49 8	04:59 19:01 (B0020) 20:55	04:05 21:52
7	08:40 15:32	07:51 16:37 7	15:16 (B0024) 15:23 (B0024) 17:43	06:14 19:51	04:57 20:57	04:04 21:53
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56
10	08:38 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:04 1	20:28 (B0018) 20:29 (B0018) 21:57
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06 4	20:27 (B0018) 20:31 (B0018) 21:58
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08 5	20:27 (B0018) 20:32 (B0018) 21:59
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10 7	20:27 (B0018) 20:34 (B0018) 21:59
14	08:33 15:44	07:35 16:54 4	16:17 (B0023) 16:21 (B0023) 17:58	05:55 20:07	04:41 21:12 10	20:26 (B0018) 20:36 (B0018) 22:00
15	08:32 15:46	07:32 16:56 9	16:14 (B0023) 16:23 (B0023) 18:01	05:52 20:09	04:39 21:14 12	20:26 (B0018) 20:38 (B0018) 22:01
16	08:31 15:48	07:30 16:59 14	16:13 (B0023) 16:27 (B0023) 18:03	05:50 20:11	04:37 21:16 13	20:26 (B0018) 20:39 (B0018) 22:02
17	08:30 15:50	07:27 17:01 17	16:11 (B0023) 16:28 (B0023) 18:05	17:32 (B0021) 20:13 4	05:47 21:18 12	20:27 (B0018) 20:39 (B0018) 22:02
18	08:28 15:52	07:25 17:03 19	16:10 (B0023) 16:29 (B0023) 18:07	17:31 (B0021) 20:15 7	05:44 21:20 11	20:28 (B0018) 20:39 (B0018) 22:03
19	08:27 15:54	07:22 17:06 20	16:10 (B0023) 16:30 (B0023) 18:09	17:30 (B0021) 20:18 10	05:42 21:22 9	20:29 (B0018) 20:38 (B0018) 22:03
20	08:25 15:56	07:20 17:08 21	16:09 (B0023) 16:30 (B0023) 18:12	17:29 (B0021) 20:20 13	05:39 21:24 6	20:30 (B0018) 20:36 (B0018) 22:03
21	08:24 15:58	07:17 17:10 21	16:09 (B0023) 16:30 (B0023) 18:14	17:29 (B0021) 20:22 14	05:36 21:26	22:04 22:04
22	08:22 16:01 8	15:11 (B0024) 15:19 (B0024) 17:13	16:10 (B0023) 16:30 (B0023) 18:16	17:30 (B0021) 20:24 13	05:34 21:28	22:04 22:04
23	08:20 16:03 11	15:11 (B0024) 15:22 (B0024) 17:15	16:10 (B0023) 16:29 (B0023) 18:18	17:30 (B0021) 20:26 12	05:31 21:30	22:04 22:04
24	08:19 16:05 14	15:09 (B0024) 15:24 (B0024) 17:17	16:10 (B0023) 16:29 (B0023) 18:20	17:31 (B0021) 20:29 9	05:28 21:32	22:04 22:04
25	08:17 16:07 16	15:08 (B0024) 15:24 (B0024) 17:20	16:12 (B0023) 16:28 (B0023) 18:23	05:26 20:31	04:20 21:34	22:04 22:04
26	08:15 16:09 17	15:08 (B0024) 15:25 (B0024) 17:22	16:13 (B0023) 16:26 (B0023) 18:25	05:23 20:33	04:19 21:35	22:04 22:04
27	08:13 16:12 18	15:08 (B0024) 15:26 (B0024) 17:24	16:15 (B0023) 16:24 (B0023) 18:27	05:21 20:35	04:17 21:37	22:04 22:04
28	08:12 16:14 19	15:08 (B0024) 15:27 (B0024) 17:27	05:42 18:29	05:18 20:38	04:16 21:39	22:04 22:04
29	08:10 16:16 20	15:08 (B0024) 15:28 (B0024)	05:42 19:31	05:16 20:40	04:14 21:40	22:04 22:04
30	08:08 16:19 20	15:08 (B0024) 15:28 (B0024)	06:36 19:34 1	19:03 (B0020) 19:04 (B0020) 20:42	05:13 21:42	22:03 22:03
31	08:06 16:21 20	15:08 (B0024) 15:28 (B0024)	06:33 19:36 5	19:01 (B0020) 19:06 (B0020)	04:12 21:44	22:03 22:03
Potential sun hours	228	263	366	429	515	539
Total, worst case	163	329	88	65	90	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,68	0,69	0,65	0,64	0,59	
Total reduction	0,13	0,11	0,15	0,27	0,32	
Total, real	21	37	13	18	28	

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: INGATORPS-BJÖRKEBERG 1:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (857)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:02	04:52 21:18	20:37 (B0018) 20:42 (B0018)	05:58 20:00	07:01 18:36	07:10 16:15
2	04:04 22:02	04:55 21:16	20:38 (B0018) 20:40 (B0018)	06:00 19:57	07:04 18:34	07:13 16:13
3	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	14:46 (B0024) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	14:43 (B0024) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:58 (B0020)	07:22 16:04	14:42 (B0024) 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:56 (B0020)	07:24 16:01	14:40 (B0024) 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:54 (B0020)	07:26 15:59	14:40 (B0024) 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:53 (B0020)	07:29 15:57	14:40 (B0024) 15:14
10	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:53 (B0020)	07:31 15:55	14:40 (B0024) 15:14
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:53 (B0020)	07:33 15:53	14:39 (B0024) 15:13
12	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:53 (B0020)	07:36 15:51	14:39 (B0024) 15:13
13	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:54 (B0020)	07:38 15:49	14:40 (B0024) 15:13
14	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 16:50 (B0023)	14:40 (B0024) 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 16:54 (B0023)	14:59 (B0024) 15:12
16	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:45 16:57 (B0023)	14:41 (B0024) 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 16:42 (B0023)	14:42 (B0024) 15:12
18	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 16:42 (B0023)	14:43 (B0024) 15:13
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 18:18 (B0021)	07:51 16:41 (B0023)	14:45 (B0024) 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 18:27 (B0021)	07:53 16:40 (B0023)	14:46 (B0024) 15:13
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 18:15 (B0021)	07:56 16:40 (B0023)	14:54 (B0024) 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 18:29 (B0021)	07:58 16:40 (B0023)	15:13 15:14
23	04:35 21:36	20:42 (B0018) 20:46 (B0018)	05:39 20:24	06:44 18:14 (B0021)	07:50 16:40 (B0023)	08:00 15:31
24	04:37 21:34	20:40 (B0018) 20:48 (B0018)	05:41 20:22	06:47 18:13 (B0021)	07:52 16:40 (B0023)	08:02 15:30
25	04:39 21:32	20:38 (B0018) 20:48 (B0018)	05:43 20:19	06:49 18:13 (B0021)	08:04 15:42 (B0023)	08:04 15:28
26	04:41 21:30	20:38 (B0018) 20:49 (B0018)	05:45 20:16	06:51 18:14 (B0021)	08:06 15:58 (B0023)	08:06 15:27
27	04:42 21:28	20:38 (B0018) 20:50 (B0018)	05:47 20:14	06:53 18:15 (B0021)	08:08 15:45 (B0023)	08:08 15:25
28	04:44 21:26	20:37 (B0018) 20:50 (B0018)	05:50 20:11	06:55 18:16 (B0021)	08:10 15:53 (B0023)	08:10 15:25
29	04:46 21:24	20:36 (B0018) 20:47 (B0018)	05:52 20:08	06:57 18:42	08:12 16:22	08:12 15:23
30	04:48 21:22	20:37 (B0018) 20:45 (B0018)	05:54 20:06	06:59 18:39	08:14 16:20	08:14 15:22
31	04:50 21:20	20:37 (B0018) 20:44 (B0018)	05:56 20:03	07:08 16:17	08:16 15:17	08:16 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case	84	7	160	224	272	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,59	0,59	0,65	0,69	0,68	
Total reduction	0,23	0,21	0,20	0,18	0,12	
Total, real	19	1	33	40	32	

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: INGATORPS-GRIMMESTORP 2:4>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (822)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 19:38	04:10 20:44	04:03 21:45	04:52 22:02	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	17:47 (B0023) 16:13	08:17 15:20
3	08:42 15:25	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	17:45 (B0023) 16:10	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:43 (B0023) 16:08	08:21 15:18
5	08:41 15:28	07:55 16:33	06:45 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	17:43 (B0023) 16:06	08:22 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	17:07 (B0023) 19:49	04:59 20:55	04:05 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	17:42 (B0023) 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	17:06 (B0023) 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:43	07:14 18:20	17:42 (B0023) 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	17:06 (B0023) 19:53	04:54 20:59	04:03 21:54	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	17:42 (B0023) 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	17:06 (B0023) 19:56	04:52 21:01	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	17:45 (B0023) 15:57	08:29 15:14
10	08:37 15:37	07:44 16:44	06:32 17:49	17:06 (B0023) 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	17:42 (B0023) 15:55	08:30 15:14
11	08:36 15:38	07:42 16:47	06:29 17:52	17:08 (B0023) 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	17:42 (B0023) 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	17:16 (B0023) 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	17:42 (B0023) 15:51	08:33 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	17:42 (B0023) 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	17:42 (B0023) 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	17:42 (B0023) 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	20:11	04:37 21:16	03:59 22:02	04:22 21:47	05:24 20:42	06:30 19:18	07:34 17:55	17:04 (B0024) 15:43	08:37 15:12
17	08:29 15:50	07:27 17:01	06:13 18:05	20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:15	07:36 17:53	17:02 (B0024) 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:38 17:50	17:01 (B0024) 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	16:32 (B0024) 18:09	20:18	04:31 21:22	03:58 22:03	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:47	17:00 (B0024) 15:37	08:40 15:13
20	08:25 15:56	07:20 17:08	16:30 (B0024) 18:12	20:20	04:29 21:24	03:58 22:03	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	17:00 (B0024) 15:35	08:40 15:13
21	08:24 15:58	07:17 17:10	16:29 (B0024) 18:14	20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	17:01 (B0024) 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	16:30 (B0024) 18:16	20:24	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:47 17:40	17:01 (B0024) 15:33	08:41 15:14
23	08:20 16:03	07:12 17:15	16:29 (B0024) 18:18	20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	17:02 (B0024) 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	16:30 (B0024) 18:20	20:28	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:46 18:56	07:52 17:35	17:04 (B0024) 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	16:30 (B0024) 18:23	20:29	04:20 21:33	04:00 22:04	04:39 21:32	05:43 20:19	06:49 18:53	07:54 16:32	17:09 (B0024) 15:28	08:43 15:16
26	08:15 16:09	07:04 17:22	16:33 (B0024) 18:25	20:31	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	17:01 (B0024) 15:27	08:43 15:16
27	08:13 16:12	07:01 17:24	16:39 (B0024) 18:27	20:33	04:17 21:37	04:01 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	17:02 (B0024) 15:25	08:43 15:17
28	08:11 16:14	06:59 17:27	16:42 (B0024) 18:29	20:35	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	17:02 (B0024) 15:24	08:43 15:18
29	08:10 16:16		16:43 (B0024) 18:30	20:37	04:14 21:40	04:02 22:03	04:46 21:24	05:52 20:08	06:57 18:42	07:03 16:22	17:03 (B0024) 15:23	08:43 15:19
30	08:08 16:19		16:44 (B0024) 18:31	20:40	04:13 21:42	04:03 22:03	04:48 21:22	05:54 20:05	06:59 18:39	07:06 16:20	17:04 (B0024) 15:22	08:43 15:20
31	08:06 16:21		16:45 (B0024) 18:32	20:42	04:11 21:44		04:50 21:20	05:56 20:03	07:08 16:17	07:08 16:17		08:43 15:21
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
Total, worst case		72		50						128		
Sun reduction		0,16		0,22						0,26		
Oper. time red.		0,99		0,99						0,99		
Wind dir. red.		0,69		0,66						0,67		
Total reduction		0,11		0,14						0,17		
Total, real		8		7						22		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: JUSTORP 1:2>2 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (835)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:34	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:04 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:54	04:09 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:27 15:14
9	08:39 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:32 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:48	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:43	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:12
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19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:41 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:36 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 19:31	05:42 20:40	05:16 21:41	04:14 22:04	04:02 21:24	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	08:08 16:18	06:56 19:34	05:40 20:42	05:13 21:42	04:13 22:03	04:02 21:22	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 19:36	05:38 20:44	05:11 21:44	04:11 22:04	04:00 21:20	04:50 20:03	05:56 16:17	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: JUSTORP 1.5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (875)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:34	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:04 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:54	04:09 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:27 15:14
9	08:39 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:32 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:48	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:27 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:43	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:41 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:36 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
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27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:41	04:02 22:04	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: JUSTORP 1.5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (894)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:20
2	08:43 15:24	08:02 16:25	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:57	07:04 18:33	07:13 16:13	08:17 15:19
3	08:42 15:25	08:00 16:28	06:51 17:34	06:25 19:42	05:06 20:49	04:08 21:48	04:05 22:02	04:56 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:03 20:51	04:07 21:50	04:06 22:01	04:58 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	08:41 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51	04:07 22:00	05:01 21:09	06:06 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:49	04:59 20:55	04:04 21:52	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:54	04:09 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:01	08:26 15:15
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:27 15:15
9	08:39 15:35	07:46 16:42	06:35 17:47	06:08 19:56	04:52 21:02	04:02 21:56	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:11	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:32 15:13
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:59	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 22:00	04:18 21:52	05:17 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:12
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:00	04:19 21:50	05:20 20:48	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:49 20:11	04:37 21:16	03:58 22:02	04:22 21:47	05:24 20:43	06:30 19:18	07:34 17:55	07:45 15:43	08:37 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:58 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:12
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15	04:33 21:20	03:58 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:09	05:41 20:18	04:31 21:22	03:58 22:03	04:27 21:43	05:30 20:35	06:36 19:10	07:41 17:47	07:51 15:38	08:40 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:58 22:04	04:29 21:41	05:32 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:41 15:13
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	03:58 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	03:58 22:04	04:33 21:38	05:37 20:27	06:42 19:01	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	08:19 16:05	07:09 17:17	05:53 18:20	05:28 20:29	04:22 21:32	03:59 22:04	04:36 21:34	05:41 20:22	06:46 18:56	07:52 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	03:59 22:04	04:38 21:32	05:43 20:19	06:49 18:53	07:54 16:32	08:04 15:28	08:43 15:15
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:00 22:04	04:42 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:25	08:43 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:01 22:04	04:44 21:26	05:49 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:41	04:02 22:04	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	08:08 16:18	06:56 17:34	05:40 18:34	05:13 20:42	04:13 21:42	04:02 22:03	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:53 17:36	05:38 18:36	05:11 20:44	04:11 21:44	04:00 22:03	04:50 21:20	05:56 20:03	07:08 16:17	07:08 15:21	08:43 15:21	08:43 15:21
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Jonsberg - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (803)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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		09:26 (2)	08:04	06:56	06:31	05:11	04:10	04:03	04:52	05:58	07:01	07:11		08:16	08:58 (2)
2	15:23	9	09:58 (4)	16:23	17:29	19:38	20:44	21:46	22:03	21:18	20:00	18:36	16:15		15:20	19 09:17 (2)
	08:43		09:26 (2)	08:02	06:54	06:28	05:08	04:09	04:04	04:54	06:00	07:04	07:13		08:18	09:00 (2)
3	15:24	8	09:58 (4)	16:25	17:31	19:40	20:47	21:47	22:02	21:16	19:58	18:34	16:13		15:19	17 09:17 (2)
	08:43		09:25 (2)	08:00	06:51	06:25	05:06	04:07	04:05	04:56	06:02	07:06	07:15		08:20	09:02 (2)
4	15:25	5	09:30 (2)	16:28	17:34	19:43	20:49	21:49	22:02	21:14	19:55	18:31	16:10		15:18	15 09:17 (2)
	08:42		09:24 (2)	07:58	06:48	06:22	05:03	04:06	04:06	04:58	06:04	07:08	07:18		08:21	09:04 (2)
5	15:27	7	09:31 (2)	16:30	17:36	19:45	20:51	21:50	22:01	21:12	19:52	18:28	16:08		15:17	14 09:18 (2)
	08:42		09:23 (2)	07:56	06:46	06:20	05:01	04:05	04:07	05:00	06:06	07:10	07:20		08:23	09:06 (2)
6	15:28	8	09:31 (2)	16:32	17:38	19:47	20:53	21:51	22:00	21:09	19:49	18:25	16:06		15:16	12 09:18 (2)
	08:41		09:22 (2)	07:53	06:43	06:17	04:59	04:04	04:08	05:03	06:09	07:12	07:22		08:25	09:08 (2)
7	15:30	10	09:32 (2)	16:35	17:40	19:49	20:55	21:53	22:00	21:07	19:46	18:22	16:03		15:16	10 09:18 (2)
	08:40		09:21 (2)	07:51	06:40	06:14	04:56	04:03	04:09	05:05	06:11	07:14	07:24		08:26	09:10 (2)
8	15:31	12	09:33 (2)	16:37	17:43	19:51	20:58	21:54	21:59	21:05	19:44	18:20	16:01		15:15	8 09:18 (2)
	08:40		09:20 (2)	07:49	06:37	06:11	04:54	04:03	04:10	05:07	06:13	07:17	07:27		08:28	09:12 (2)
9	15:33	13	09:33 (2)	16:40	17:45	19:54	21:00	21:55	21:58	21:02	19:41	18:17	15:59		15:14	7 09:19 (2)
	08:39		09:19 (2)	07:47	06:35	06:08	04:52	04:02	04:12	05:09	06:15	07:19	07:29		08:29	09:13 (2)
10	15:34	15	09:34 (2)	16:42	17:47	19:56	21:02	21:56	21:57	21:00	19:38	18:14	15:57		15:14	5 09:18 (2)
	08:38		09:18 (2)	07:44	06:32	06:06	04:49	04:01	04:13	05:11	06:17	07:21	07:31		08:30	09:15 (2)
11	15:36	17	09:35 (2)	16:44	17:49	19:58	21:04	21:57	21:56	20:58	19:35	18:11	15:55		15:13	9 09:47 (4)
	08:37		09:16 (2)	07:42	06:29	06:03	04:47	04:00	04:14	05:13	06:19	07:23	07:34		08:32	09:16 (2)
12	15:38	19	09:35 (2)	16:47	17:52	20:00	21:06	21:58	21:54	20:55	19:32	18:09	15:53		15:13	9 09:48 (4)
	08:36		09:16 (2)	07:40	06:26	06:00	04:45	04:00	04:16	05:15	06:21	07:25	07:36		08:33	09:18 (2)
13	15:40	20	09:36 (2)	16:49	17:54	20:02	21:08	21:59	21:53	20:53	19:30	18:06	15:51		15:13	8 09:49 (4)
	08:35		09:17 (2)	07:37	06:24	05:58	04:43	03:59	04:17	05:17	06:23	07:28	07:38		08:34	09:41 (4)
14	15:42	20	09:37 (2)	16:51	17:56	20:05	21:10	22:00	21:52	20:50	19:27	18:03	15:49		15:12	9 09:50 (4)
	08:34		09:17 (2)	07:35	06:21	05:55	04:41	03:59	04:19	05:19	06:25	07:30	07:40		08:35	09:41 (4)
15	15:44	20	09:37 (2)	16:54	17:58	20:07	21:12	22:01	21:51	20:48	19:24	18:01	15:47		15:12	10 09:51 (4)
	08:33		09:11 (3)	07:32	06:18	05:52	04:39	03:59	04:21	05:22	06:28	07:32	07:43		08:37	09:41 (4)
16	15:46	21	09:38 (2)	16:56	18:01	20:09	21:14	22:02	21:49	20:45	19:21	17:58	15:45		15:12	10 09:51 (4)
	08:31		09:09 (3)	07:30	06:15	05:49	04:37	03:58	04:22	05:24	06:30	07:34	07:45		08:38	09:42 (4)
17	15:48	23	09:38 (2)	16:59	18:03	20:11	21:17	22:02	21:48	20:43	19:18	17:55	15:43		15:12	11 09:53 (4)
	08:30		09:07 (3)	07:27	06:13	05:47	04:35	03:58	04:24	05:26	06:32	07:36	07:47	08:37 (3)	08:38	09:43 (4)
18	15:50	25	09:38 (2)	17:01	18:05	20:13	21:19	22:03	21:46	20:40	19:16	17:53	15:41	9 09:04 (2)	15:12	11 09:54 (4)
	08:29		09:05 (3)	07:25	06:10	05:44	04:33	03:58	04:25	05:28	06:34	07:39	07:49	08:37 (3)	08:39	09:42 (4)
19	15:52	27	09:37 (2)	17:03	18:07	20:16	21:21	22:03	21:45	20:38	19:13	17:50	15:39	18 09:08 (2)	15:12	11 09:53 (4)
	08:27		09:04 (3)	07:22	06:07	05:41	04:31	03:58	04:27	05:30	06:36	07:41	07:52	08:35 (3)	08:40	09:43 (4)
20	15:54	28	09:38 (2)	17:06	18:09	20:18	21:23	22:04	21:43	20:35	19:10	17:47	15:37	25 09:10 (2)	15:12	11 09:54 (4)
	08:26		09:02 (3)	07:20	06:04	05:39	04:29	03:58	04:29	05:32	06:38	07:43	07:54	08:36 (3)	08:41	09:43 (4)
21	15:56	30	09:38 (2)	17:08	18:12	20:20	21:25	22:04	21:41	20:32	19:07	17:45	15:36	27 09:12 (2)	15:13	12 09:55 (4)
	08:24		09:00 (3)	07:17	06:01	05:36	04:27	03:58	04:31	05:34	06:40	07:45	07:56	08:35 (3)	08:41	09:43 (4)
22	15:58	30	09:37 (2)	17:10	18:14	20:22	21:26	22:04	21:40	20:30	19:04	17:42	15:34	30 09:12 (2)	15:13	12 09:55 (4)
	08:22		09:01 (3)	07:15	05:59	05:33	04:25	03:58	04:33	05:37	06:42	07:48	07:58	08:38 (3)	08:42	09:44 (4)
23	16:00	27	09:37 (2)	17:13	18:16	20:24	21:28	22:05	21:38	20:27	19:02	17:40	15:32	30 09:14 (2)	15:13	12 09:56 (4)
	08:21		09:02 (3)	07:12	05:56	05:31	04:23	03:58	04:34	05:39	06:44	07:50	08:00	08:40 (3)	08:43	09:44 (4)
24	16:02	24	09:36 (2)	17:15	18:18	20:27	21:30	22:05	21:36	20:25	18:59	17:37	15:31	28 09:14 (2)	15:14	12 09:56 (4)
	08:19		09:03 (3)	07:10	05:53	05:28	04:22	03:59	04:36	05:41	06:47	07:52	08:02	08:43 (3)	08:43	09:46 (4)
25	16:05	18	09:34 (2)	17:17	18:21	20:29	21:32	22:05	21:34	20:22	18:56	17:35	15:29	27 09:15 (2)	15:15	11 09:57 (4)
	08:17		09:04 (3)	07:07	05:50	05:26	04:20	03:59	04:38	05:43	06:49	06:55	08:04	08:45 (3)	08:43	09:46 (4)
26	16:07	9	09:31 (2)	17:20	18:23	20:31	21:34	22:05	21:32	20:19	18:53	16:32	15:28	25 09:16 (2)	15:15	11 09:57 (4)
	08:16			07:04	05:47	05:23	04:18	04:00	04:40	05:45	06:51	06:57	08:06	08:47 (3)	08:44	09:47 (4)
27	16:09			17:22	18:25	20:33	21:36	22:05	21:31	20:17	18:50	16:30	15:26	23 09:16 (2)	15:16	10 09:57 (4)
	08:14			07:02	05:45	05:21	04:17	04:00	04:42	05:47	06:53	06:59	08:08	08:50 (3)	08:44	09:47 (4)
28	16:11			17:24	18:27	20:36	21:38	22:04	21:29	20:14	18:47	16:27	15:25	21 09:17 (2)	15:17	11 09:58 (4)
	08:12			06:59	05:42	05:18	04:15	04:01	04:44	05:49	06:55	07:01	08:10	08:57 (2)	08:44	09:48 (4)
29	16:14			17:27	18:29	20:38	21:39	22:04	21:27	20:11	18:45	16:25	15:24	20 09:17 (2)	15:18	10 09:58 (4)
	08:10				06:39	05:16	04:14	04:01	04:46	05:52	06:57	07:04	08:12	08:57 (2)	08:44	09:49 (4)
30	16:16				19:32	20:40	21:41	22:04	21:25	20:08	18:42	16:22	15:23	20 09:17 (2)	15:19	10 09:59 (4)
	08:08				06:36	05:13	04:12	04:02	04:48	05:54	06:59	07:06	08:14	08:57 (2)	08:44	09:49 (4)
31	16:18				19:34	20:42	21:43	22:03	21:22	20:06	18:39	16:20	15:21	20 09:17 (2)	15:20	9 09:58 (4)
	08:06				06:33		04:11		04:50	05:56		07:08			08:44	09:50 (4)
	16:21				19:36		21:44		21:20	20:03		16:17			15:21	8 09:58 (4)
Potential sun hours	227		262	366		429	515	539	538	474	386	321	241		207	
Total, worst case		445											323		334	
Sun reduction		0,19											0,17		0,13	
Oper. time red.		0,99											0,99		0,99	
Wind dir. red.		0,57											0,57		0,59	
Total reduction		0,11											0,10		0,08	
Total, real		47											31		26	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (909)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

		January	February		March		April		May		June
1	08:43	08:04		06:57	08:00 (B0005)	06:31	06:57 (B0014)	05:11	05:44 (B0008)	04:11	04:55 (B0007)
	15:23	16:24		17:29	12 08:12 (B0005)	19:38	35 07:59 (B0004)	20:45	15 05:59 (B0008)	21:46	15 05:10 (B0007)
2	08:43	08:02		06:54	08:03 (B0005)	06:28	06:54 (B0014)	05:09	05:43 (B0008)	04:09	04:55 (B0007)
	15:25	16:26		17:32	5 08:08 (B0005)	19:41	37 07:58 (B0004)	20:47	17 06:00 (B0008)	21:47	15 05:10 (B0007)
3	08:43	08:00		06:51		06:26	06:52 (B0014)	05:06	05:43 (B0008)	04:08	04:55 (B0007)
	15:26	16:28		17:34		19:43	38 07:57 (B0004)	20:49	17 06:00 (B0008)	21:49	15 05:10 (B0007)
4	08:42	07:58		06:49		06:23	06:51 (B0009)	05:04	05:42 (B0008)	04:07	04:55 (B0007)
	15:27	16:31		17:36		19:45	35 07:55 (B0004)	20:51	19 06:01 (B0008)	21:50	16 05:11 (B0007)
5	08:42	07:56		06:46		06:20	06:48 (B0009)	05:02	05:31 (B0022)	04:06	04:54 (B0007)
	15:29	16:33		17:39		19:47	34 07:53 (B0004)	20:53	22 06:00 (B0008)	21:51	17 05:11 (B0007)
6	08:41	07:53		06:43		06:17	06:46 (B0009)	04:59	05:29 (B0022)	04:05	04:55 (B0007)
	15:30	16:35		17:41		19:49	31 07:50 (B0004)	20:55	26 06:00 (B0008)	21:53	17 05:12 (B0007)
7	08:40	07:51		06:40		06:14	06:45 (B0009)	04:57	05:27 (B0022)	04:04	04:55 (B0007)
	15:32	16:38		17:43		19:52	25 07:47 (B0004)	20:58	30 06:00 (B0008)	21:54	17 05:12 (B0007)
8	08:40	07:49		06:38		06:12	06:44 (B0009)	04:55	05:26 (B0022)	04:03	04:55 (B0007)
	15:34	16:40		17:45		19:54	18 07:02 (B0009)	21:00	31 06:00 (B0008)	21:55	17 05:12 (B0007)
9	08:39	07:47		06:35		06:09	06:43 (B0009)	04:52	05:25 (B0022)	04:03	04:56 (B0007)
	15:35	16:43		17:48		19:56	19 07:02 (B0009)	21:02	32 06:00 (B0008)	21:56	16 05:12 (B0007)
10	08:38	07:44		06:32		06:06	06:44 (B0009)	04:50	05:25 (B0022)	04:02	04:55 (B0007)
	15:37	16:45		17:50		19:58	18 07:02 (B0009)	21:04	31 05:59 (B0008)	21:57	17 05:12 (B0007)
11	08:37	07:42		06:30	06:56 (B0010)	06:03	06:43 (B0009)	04:48	05:25 (B0022)	04:01	04:56 (B0007)
	15:39	16:47		17:52	6 07:02 (B0010)	20:00	18 07:01 (B0009)	21:06	30 05:59 (B0008)	21:58	17 05:13 (B0007)
12	08:36	07:40		06:27	06:53 (B0010)	06:01	06:43 (B0009)	04:46	05:25 (B0022)	04:01	04:55 (B0007)
	15:41	16:50		17:54	10 07:03 (B0010)	20:03	17 07:00 (B0009)	21:08	27 05:57 (B0008)	21:59	17 05:12 (B0007)
13	08:35	07:37		06:24	06:50 (B0010)	05:58	06:44 (B0009)	04:44	05:25 (B0022)	04:00	04:56 (B0007)
	15:42	16:52		17:57	14 07:04 (B0010)	20:05	16 07:00 (B0009)	21:10	25 05:56 (B0008)	22:00	17 05:13 (B0007)
14	08:34	07:35		06:21	06:50 (B0010)	05:55	06:44 (B0009)	04:41	05:25 (B0022)	04:00	04:57 (B0007)
	15:44	16:54		17:59	15 07:05 (B0010)	20:07	14 06:58 (B0009)	21:12	20 05:54 (B0008)	22:01	16 05:13 (B0007)
15	08:33	07:32	08:06 (B0005)	06:19	06:49 (B0010)	05:53	06:46 (B0009)	04:39	05:26 (B0022)	03:59	04:57 (B0007)
	15:46	16:57	5 08:11 (B0005)	18:01	16 07:05 (B0010)	20:09	9 06:55 (B0009)	21:15	12 05:51 (B0008)	22:01	17 05:14 (B0007)
16	08:31	07:30	08:02 (B0005)	06:16	06:48 (B0010)	05:50		04:37	05:28 (B0022)	03:59	04:56 (B0007)
	15:48	16:59	12 08:14 (B0005)	18:03	17 07:05 (B0010)	20:11		21:17	8 05:36 (B0022)	22:02	17 05:13 (B0007)
17	08:30	07:28	07:59 (B0005)	06:13	06:48 (B0010)	05:47		04:35	05:29 (B0022)	03:59	04:57 (B0007)
	15:50	17:01	16 08:15 (B0005)	18:05	16 07:04 (B0010)	20:14		21:19	5 05:34 (B0022)	22:03	16 05:13 (B0007)
18	08:29	07:25	07:59 (B0005)	06:10	06:48 (B0010)	05:45		04:33		03:59	04:57 (B0007)
	15:52	17:04	18 08:17 (B0005)	18:08	15 07:03 (B0010)	20:16		21:21		22:03	16 05:13 (B0007)
19	08:27	07:23	07:57 (B0005)	06:07	06:49 (B0010)	05:42	06:09 (B0013)	04:31		03:59	04:57 (B0007)
	15:54	17:06	21 08:18 (B0005)	18:10	12 07:01 (B0010)	20:18	5 06:14 (B0013)	21:23		22:04	16 05:13 (B0007)
20	08:26	07:20	07:56 (B0005)	06:05	06:47 (B0004)	05:39	06:07 (B0013)	04:30		03:59	04:58 (B0007)
	15:57	17:09	22 08:18 (B0005)	18:12	13 07:00 (B0010)	20:20	10 06:17 (B0013)	21:25		22:04	17 05:15 (B0007)
21	08:24	07:18	07:56 (B0005)	06:02	06:42 (B0004)	05:37	06:05 (B0013)	04:28		03:59	04:58 (B0007)
	15:59	17:11	23 08:19 (B0005)	18:14	14 06:56 (B0004)	20:22	12 06:17 (B0013)	21:26		22:04	17 05:15 (B0007)
22	08:22	07:15	07:56 (B0005)	05:59	06:39 (B0004)	05:34	06:04 (B0013)	04:26		03:59	04:58 (B0007)
	16:01	17:13	23 08:19 (B0005)	18:16	19 06:58 (B0004)	20:25	14 06:18 (B0013)	21:28		22:04	17 05:15 (B0007)
23	08:21	07:12	07:55 (B0005)	05:56	06:37 (B0004)	05:31	06:03 (B0013)	04:24		03:59	04:58 (B0007)
	16:03	17:16	23 08:18 (B0005)	18:19	22 06:59 (B0004)	20:27	15 06:18 (B0013)	21:30		22:05	17 05:15 (B0007)
24	08:19	07:10	07:56 (B0005)	05:53	06:35 (B0004)	05:29	06:03 (B0013)	04:22		04:00	04:59 (B0007)
	16:05	17:18	23 08:19 (B0005)	18:21	25 07:00 (B0004)	20:29	15 06:18 (B0013)	21:32		22:05	16 05:15 (B0007)
25	08:17	07:07	07:56 (B0005)	05:51	06:35 (B0004)	05:26	06:03 (B0013)	04:21		04:00	04:59 (B0007)
	16:08	17:20	22 08:18 (B0005)	18:23	26 07:01 (B0004)	20:31	14 06:17 (B0013)	21:34		22:05	16 05:15 (B0007)
26	08:16	07:05	07:56 (B0005)	05:48	06:34 (B0004)	05:24	06:03 (B0013)	04:19		04:00	04:59 (B0007)
	16:10	17:22	21 08:17 (B0005)	18:25	27 07:01 (B0004)	20:33	14 06:17 (B0013)	21:36		22:04	17 05:16 (B0007)
27	08:14	07:02	07:56 (B0005)	05:45	06:33 (B0004)	05:21	06:03 (B0013)	04:18	04:59 (B0007)	04:01	04:59 (B0007)
	16:12	17:25	19 08:15 (B0005)	18:27	28 07:01 (B0004)	20:36	12 06:15 (B0013)	21:37	7 05:06 (B0007)	22:04	17 05:16 (B0007)
28	08:12	06:59	07:58 (B0005)	05:42	06:32 (B0004)	05:19	06:05 (B0013)	04:16	04:57 (B0007)	04:02	05:00 (B0007)
	16:14	17:27	17 08:15 (B0005)	18:30	29 07:01 (B0004)	20:38	9 06:14 (B0013)	21:39	9 05:06 (B0007)	22:04	16 05:16 (B0007)
29	08:10			06:39	07:31 (B0004)	05:16	05:49 (B0008)	04:15	04:56 (B0007)	04:02	04:59 (B0007)
	16:17			19:32	30 08:01 (B0004)	20:40	12 06:12 (B0013)	21:41	11 05:07 (B0007)	22:04	17 05:16 (B0007)
30	08:08			06:37	07:32 (B0004)	05:14	05:46 (B0008)	04:13	04:56 (B0007)	04:03	05:00 (B0007)
	16:19			19:34	29 08:01 (B0004)	20:42	11 05:57 (B0008)	21:42	12 05:08 (B0007)	22:03	16 05:16 (B0007)
31	08:06			06:34	07:00 (B0014)			04:12	04:55 (B0007)		
	16:21			19:36	31 08:00 (B0004)			21:44	14 05:09 (B0007)		
Potential sun hours	228	263		366		429		515		539	
Total, worst case		265		431		507		420		494	
Sun reduction		0,16		0,22		0,42		0,53		0,43	
Oper. time red.		0,99		0,99		0,99		0,99		0,99	
Wind dir. red.		0,59		0,62		0,65		0,68		0,69	
Total reduction		0,09		0,13		0,27		0,35		0,29	
Total, real		25		58		137		149		142	

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (909)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

July		August		September		October		November		December	
1	04:04	05:00 (B0007)	04:53	05:35 (B0022)	05:58	06:42 (B0009)	07:02	07:31 (B0010)	07:11	08:16	
2	22:03	17 05:17 (B0007)	21:18	29 06:08 (B0008)	20:00	18 07:00 (B0009)	18:37	12 07:43 (B0010)	16:15	15:21	
3	04:05	05:01 (B0007)	04:55	05:35 (B0022)	06:01	06:41 (B0009)	07:04	07:33 (B0010)	07:13	08:18	
4	22:02	16 05:17 (B0007)	21:16	30 06:09 (B0008)	19:58	19 07:00 (B0009)	18:34	8 07:41 (B0010)	16:13	15:20	
5	04:06	05:00 (B0007)	04:57	05:35 (B0022)	06:03	06:41 (B0009)	07:06		07:15	08:20	
6	22:02	17 05:17 (B0007)	21:14	32 06:10 (B0008)	19:55	19 07:00 (B0009)	18:31		16:11	15:19	
7	04:07	05:00 (B0007)	04:59	05:36 (B0022)	06:05	06:41 (B0009)	07:08		07:18	08:21	
8	22:01	17 05:17 (B0007)	21:12	31 06:10 (B0008)	19:52	18 06:59 (B0009)	18:28		16:09	15:18	
9	04:08	05:00 (B0007)	05:01	05:36 (B0022)	06:07	06:41 (B0009)	07:10		07:20	08:23	
10	22:00	17 05:17 (B0007)	21:09	31 06:11 (B0008)	19:49	25 07:43 (B0004)	18:26		16:06	15:17	
11	04:09	05:01 (B0007)	05:03	05:38 (B0022)	06:09	06:42 (B0009)	07:13		07:22	08:25	
12	21:59	16 05:17 (B0007)	21:07	30 06:11 (B0008)	19:47	31 07:46 (B0004)	18:23		16:04	15:16	
13	04:10	05:02 (B0007)	05:05	05:40 (B0022)	06:11	06:43 (B0009)	07:15		07:25	08:26	
14	21:59	16 05:18 (B0007)	21:05	26 06:11 (B0008)	19:44	35 07:48 (B0004)	18:20		16:02	15:16	
15	04:11	05:02 (B0007)	05:07	05:41 (B0022)	06:13	06:45 (B0009)	07:17		07:27	08:28	
16	21:58	16 05:18 (B0007)	21:02	20 06:10 (B0008)	19:41	36 07:49 (B0004)	18:17		16:00	15:15	
17	04:13	05:02 (B0007)	05:09	05:51 (B0008)	06:15	06:46 (B0014)	07:19		07:29	08:29	
18	21:57	16 05:18 (B0007)	21:00	18 06:09 (B0008)	19:38	36 07:50 (B0004)	18:15		15:57	15:15	
19	04:14	05:02 (B0007)	05:12	05:51 (B0008)	06:17	06:47 (B0014)	07:21		07:31	08:30	
20	21:56	16 05:18 (B0007)	20:58	18 06:09 (B0008)	19:36	37 07:51 (B0004)	18:12		15:55	15:14	
21	04:15	05:03 (B0007)	05:14	05:52 (B0008)	06:20	06:49 (B0014)	07:23		07:34	08:32	
22	21:54	14 05:17 (B0007)	20:55	16 06:08 (B0008)	19:33	35 07:51 (B0004)	18:09		15:53	15:14	
23	04:17	05:04 (B0007)	05:16	05:53 (B0008)	06:22	06:51 (B0014)	07:26		07:36	08:33	
24	21:53	14 05:18 (B0007)	20:53	14 06:07 (B0008)	19:30	31 07:51 (B0004)	18:07	9 08:35 (B0005)	15:51	15:13	
25	04:18	05:04 (B0007)	05:18	05:55 (B0008)	06:24	07:22 (B0004)	07:28	08:32 (B0005)	07:38	08:34	
26	21:52	13 05:17 (B0007)	20:50	10 06:05 (B0008)	19:27	29 07:51 (B0004)	18:04	14 08:46 (B0005)	15:49	15:13	
27	04:20	05:04 (B0007)	05:20	05:57 (B0008)	06:26	07:22 (B0004)	07:30	08:31 (B0005)	07:40	08:35	
28	21:51	12 05:16 (B0007)	20:48	11 06:20 (B0013)	19:24	29 07:51 (B0004)	18:01	17 08:48 (B0005)	15:47	15:13	
29	04:21	05:06 (B0007)	05:22	06:12 (B0013)	06:28	07:22 (B0004)	07:32	08:29 (B0005)	07:43	08:36	
30	21:49	10 05:16 (B0007)	20:45	10 06:22 (B0013)	19:22	29 07:51 (B0004)	17:58	20 08:49 (B0005)	15:45	15:13	
31	04:23	05:07 (B0007)	05:24	06:11 (B0013)	06:30	07:22 (B0004)	07:34	08:28 (B0005)	07:45	08:37	
32	21:48	8 05:15 (B0007)	20:43	12 06:23 (B0013)	19:19	29 07:51 (B0004)	17:56	21 08:49 (B0005)	15:43	15:13	
33	04:25	05:09 (B0007)	05:26	06:10 (B0013)	06:32	07:22 (B0004)	07:37	08:28 (B0005)	07:47	08:38	
34	21:46	5 05:14 (B0007)	20:40	13 06:23 (B0013)	19:16	28 07:50 (B0004)	17:53	22 08:50 (B0005)	15:42	15:13	
35	04:26		05:29	06:09 (B0013)	06:34	07:22 (B0004)	07:39	08:27 (B0005)	07:49	08:39	
36	21:45		20:38	06:24 (B0013)	19:13	27 07:49 (B0004)	17:51	23 08:50 (B0005)	15:40	15:13	
37	04:28		05:31	06:09 (B0013)	06:36	07:23 (B0004)	07:41	08:26 (B0005)	07:52	08:40	
38	21:43		20:35	06:24 (B0013)	19:10	25 07:48 (B0004)	17:48	23 08:49 (B0005)	15:38	15:13	
39	04:30		05:33	06:09 (B0013)	06:38	07:23 (B0004)	07:43	08:27 (B0005)	07:54	08:41	
40	21:41		20:33	06:23 (B0013)	19:08	23 07:46 (B0004)	17:45	23 08:50 (B0005)	15:36	15:13	
41	04:32		05:35	06:09 (B0013)	06:41	07:25 (B0004)	07:46	08:27 (B0005)	07:56	08:41	
42	21:40		20:30	06:23 (B0013)	19:05	19 07:44 (B0004)	17:43	22 08:49 (B0005)	15:35	15:14	
43	04:33		05:37	06:10 (B0013)	06:43	07:26 (B0004)	07:48	08:28 (B0005)	07:58	08:42	
44	21:38		20:27	06:22 (B0013)	19:02	16 07:42 (B0004)	17:40	21 08:49 (B0005)	15:33	15:14	
45	04:35		05:39	06:11 (B0013)	06:45	07:29 (B0004)	07:50	08:28 (B0005)	08:00	08:42	
46	21:36		20:25	9 06:20 (B0013)	18:59	13 07:42 (B0010)	17:38	20 08:48 (B0005)	15:32	15:15	
47	04:37		05:41	06:13 (B0013)	06:47	07:33 (B0010)	07:52	08:29 (B0005)	08:02	08:43	
48	21:34		20:22	5 06:18 (B0013)	18:56	11 07:44 (B0010)	17:35	18 08:46 (B0005)	15:30	15:15	
49	04:39		05:44		06:49	07:31 (B0010)	06:55	07:30 (B0005)	08:04	08:43	
50	21:32		20:19		18:53	14 07:45 (B0010)	16:33	15 07:45 (B0005)	15:29	15:16	
51	04:41		05:46		06:51	07:30 (B0010)	06:57	07:32 (B0005)	08:06	08:43	
52	21:31		20:17		18:51	16 07:46 (B0010)	16:30	10 07:42 (B0005)	15:27	15:17	
53	04:43		05:48		06:53	07:30 (B0010)	06:59		08:08	08:44	
54	21:29	6 05:45 (B0022)	20:14	3 06:54 (B0009)	18:48	17 07:47 (B0010)	16:28		15:26	15:18	
55	04:45	05:37 (B0022)	05:50	06:47 (B0009)	06:55	07:30 (B0010)	07:02		08:10	08:44	
56	21:27	10 05:47 (B0022)	20:11	10 06:57 (B0009)	18:45	16 07:46 (B0010)	16:25		15:24	15:19	
57	04:47	05:37 (B0022)	05:52	06:45 (B0009)	06:58	07:30 (B0010)	07:04		08:12	08:44	
58	21:25	17 06:04 (B0008)	20:09	14 06:59 (B0009)	18:42	16 07:46 (B0010)	16:23		15:23	15:20	
59	04:49	05:36 (B0022)	05:54	06:44 (B0009)	07:00	07:30 (B0010)	07:06		08:14	08:44	
60	21:22	23 06:06 (B0008)	20:06	16 07:00 (B0009)	18:39	15 07:45 (B0010)	16:20		15:22	15:21	
61	04:51	05:35 (B0022)	05:56	06:43 (B0009)			07:08			08:44	
62	21:20	26 06:07 (B0008)	20:03	17 07:00 (B0009)			16:18			15:22	
Potential sun hours	538		474		386		321		241	207	
Total, worst case		322		495		712		298			
Sun reduction		0,38		0,35		0,31		0,26			
Oper. time red.		0,99		0,99		0,99		0,99			
Wind dir. red.		0,69		0,67		0,63		0,59			
Total reduction		0,26		0,23		0,19		0,15			
Total, real		83		115		137		45			

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (823)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June					
1	08:43	08:04	06:57	07:24 (B0009)	06:31	06:57 (B0022)	05:11	05:40 (B0006)	04:11	05:01 (B0002)	
	15:23	16:24	17:29	5 07:29 (B0009)	19:38	29 07:51 (B0003)	20:45	11 05:51 (B0006)	21:46	16 05:17 (B0002)	
2	08:43	08:02	06:54	07:21 (B0009)	06:28	06:54 (B0022)	05:09	05:38 (B0006)	04:09	05:01 (B0002)	
	15:25	16:26	17:32	8 07:29 (B0009)	19:41	31 07:49 (B0003)	20:47	13 05:51 (B0006)	21:47	17 05:18 (B0002)	
3	08:43	08:00	06:51	07:18 (B0009)	06:26	06:52 (B0022)	05:06	05:38 (B0006)	04:08	05:00 (B0002)	
	15:26	16:28	17:34	11 07:29 (B0009)	19:43	31 07:48 (B0003)	20:49	13 05:51 (B0006)	21:49	19 05:19 (B0002)	
4	08:42	07:58	06:49	07:16 (B0009)	06:23	06:49 (B0022)	05:04	05:39 (B0006)	04:07	04:59 (B0002)	
	15:27	16:31	17:36	14 07:30 (B0009)	19:45	31 07:46 (B0003)	20:51	12 05:51 (B0006)	21:50	21 05:20 (B0002)	
5	08:42	07:56	06:46	07:15 (B0009)	06:20	06:47 (B0022)	05:02	05:38 (B0006)	04:06	04:58 (B0002)	
	15:29	16:33	17:39	14 07:29 (B0009)	19:47	29 07:44 (B0003)	20:53	11 05:49 (B0006)	21:51	23 05:21 (B0002)	
6	08:41	07:53	06:43	07:15 (B0009)	06:17	06:47 (B0022)	04:59	05:40 (B0006)	04:05	04:59 (B0002)	
	15:30	16:35	17:41	13 07:28 (B0009)	19:49	21 07:40 (B0003)	20:55	8 05:48 (B0006)	21:53	23 05:22 (B0002)	
7	08:40	07:51	06:41	07:16 (B0009)	06:14	06:49 (B0022)	04:57	05:43 (B0006)	04:04	04:58 (B0002)	
	15:32	16:38	17:43	10 07:26 (B0009)	19:52	8 06:57 (B0022)	20:58	2 05:45 (B0006)	21:54	24 05:22 (B0002)	
8	08:40	07:49	06:38	07:18 (B0009)	06:12	06:39 (B0007)	04:55		04:03	04:58 (B0002)	
	15:33	16:40	17:45	5 07:23 (B0009)	19:54	5 06:54 (B0022)	21:00		21:55	24 05:22 (B0002)	
9	08:39	07:47	06:35	06:09	06:09	06:35 (B0007)	04:52		04:03	04:58 (B0002)	
	15:35	16:43	17:48	19:56	9 06:44 (B0007)	21:02			21:56	26 05:24 (B0002)	
10	08:38	07:44	06:32	06:06	06:33 (B0007)	04:50			04:02	04:57 (B0002)	
	15:37	16:45	17:50	19:58	13 06:46 (B0007)	21:04			21:57	27 05:24 (B0002)	
11	08:37	07:42	06:30	06:03	06:32 (B0007)	04:48			04:01	04:58 (B0002)	
	15:39	16:47	17:52	20:00	14 06:46 (B0007)	21:06			21:58	26 05:24 (B0002)	
12	08:36	07:40	06:27	06:01	06:31 (B0007)	04:46			04:01	04:57 (B0002)	
	15:41	16:50	17:54	20:03	15 06:46 (B0007)	21:08			21:59	27 05:24 (B0002)	
13	08:35	07:37	06:24	05:58	06:31 (B0007)	04:44			04:00	04:58 (B0002)	
	15:42	16:52	17:57	20:05	16 06:47 (B0007)	21:10			22:00	27 05:25 (B0002)	
14	08:34	07:35	06:21	05:55	06:30 (B0007)	04:41			04:00	04:58 (B0002)	
	15:44	16:54	17:59	20:07	16 06:46 (B0007)	21:13			22:01	28 05:26 (B0002)	
15	08:33	07:33	06:19	05:53	06:30 (B0007)	04:39			03:59	04:58 (B0002)	
	15:46	16:57	18:01	20:09	15 06:45 (B0007)	21:15			22:01	28 05:26 (B0002)	
16	08:31	07:30	06:16	05:50	06:31 (B0007)	04:37			03:59	04:57 (B0002)	
	15:48	16:59	18:03	20:11	13 06:44 (B0007)	21:17			22:02	29 05:26 (B0002)	
17	08:30	07:28	06:13	06:39 (B0008)	05:47	06:32 (B0007)	04:35		03:59	04:58 (B0002)	
	15:50	17:01	18:05	5 06:44 (B0008)	20:14	10 06:42 (B0007)	21:19		22:03	28 05:26 (B0002)	
18	08:29	07:25	06:10	06:36 (B0008)	05:45	06:34 (B0007)	04:33		03:59	04:58 (B0002)	
	15:52	17:04	18:08	9 06:45 (B0008)	20:16	6 06:40 (B0007)	21:21		22:03	28 05:26 (B0002)	
19	08:27	07:23	06:07	06:33 (B0008)	05:42		04:31		03:59	04:58 (B0002)	
	15:54	17:06	18:10	12 06:45 (B0008)	20:18		21:23		22:04	28 05:26 (B0002)	
20	08:26	07:20	06:05	06:31 (B0008)	05:39		04:30		03:59	04:59 (B0002)	
	15:57	17:09	18:12	15 06:46 (B0008)	20:20		21:25		22:04	29 05:28 (B0002)	
21	08:24	07:18	06:02	06:28 (B0013)	05:37		04:28		03:59	04:59 (B0002)	
	15:59	1 09:01 (B0005)	17:11	18:14	21 06:49 (B0003)	20:22	21:27		22:04	29 05:28 (B0002)	
22	08:23	07:15	05:59	06:26 (B0013)	05:34		04:26		03:59	04:59 (B0002)	
	16:01	4 09:02 (B0005)	17:13	18:16	25 06:51 (B0003)	20:25	21:28		22:04	29 05:28 (B0002)	
23	08:21	07:12	05:56	06:26 (B0013)	05:31		04:24		03:59	04:59 (B0002)	
	16:03	6 09:02 (B0005)	17:16	18:19	26 06:52 (B0003)	20:27	21:30		22:05	29 05:28 (B0002)	
24	08:19	07:10	05:53	06:26 (B0013)	05:29		04:22		04:00	05:00 (B0002)	
	16:05	9 09:03 (B0005)	17:18	18:21	26 06:52 (B0003)	20:29	21:32		22:05	28 05:28 (B0002)	
25	08:17	07:07	05:51	06:27 (B0003)	05:26		04:21		04:00	05:00 (B0002)	
	16:08	11 09:03 (B0005)	17:20	18:23	27 06:54 (B0003)	20:31	21:34		22:05	28 05:28 (B0002)	
26	08:16	07:05	05:48	06:26 (B0003)	05:24		04:19		04:00	05:00 (B0002)	
	16:10	13 09:03 (B0005)	17:22	18:25	28 06:54 (B0003)	20:34	21:36		22:05	29 05:29 (B0002)	
27	08:14	07:02	05:45	06:25 (B0003)	05:21		04:18		04:01	05:00 (B0002)	
	16:12	14 09:03 (B0005)	17:25	18:27	28 06:53 (B0003)	20:36	21:38		22:04	28 05:28 (B0002)	
28	08:12	06:59	05:42	06:25 (B0003)	05:19		04:16		04:02	05:01 (B0002)	
	16:14	13 09:02 (B0005)	17:27	18:30	28 06:53 (B0003)	20:38	4 05:51 (B0006)		22:04	28 05:29 (B0002)	
29	08:10	06:59	05:39	07:24 (B0003)	05:16		04:15		05:06 (B0002)	04:02	05:01 (B0002)
	16:17	12 09:02 (B0005)	17:25	19:32	28 07:52 (B0003)	20:40	6 05:51 (B0006)		05:12 (B0002)	22:04	27 05:28 (B0002)
30	08:08	06:55	05:37	07:25 (B0003)	05:14		04:13		05:04 (B0002)	04:03	05:01 (B0002)
	16:19	9 09:01 (B0005)	17:24	19:34	28 07:53 (B0003)	20:42	9 05:51 (B0006)		05:14 (B0002)	22:03	28 05:29 (B0002)
31	08:06	06:54	05:34	07:24 (B0003)			04:12		05:02 (B0002)		
	16:21	5 08:59 (B0005)	17:27	19:36	28 07:52 (B0003)		21:44	14 05:16 (B0002)			
Potential sun hours	228	262	366	429	515	539					
Total, worst case	97	178	414	331	100	781					
Sun reduction	0,19	0,16	0,22	0,42	0,53	0,43					
Oper. time red.	0,99	0,99	0,99	0,99	0,99	0,99					
Wind dir. red.	0,55	0,58	0,62	0,65	0,68	0,69					
Total reduction	0,10	0,09	0,13	0,27	0,35	0,29					
Total, real	10	16	56	89	35	224					

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:17>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (823)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03 27	05:02 (B0002) 05:29 (B0002) 21:18	04:53 21:01 14	05:58 06:31 (B0007) 18:37	07:02 16:15 18	07:45 (B0004) 08:03 (B0004) 15:21
2	04:05 22:02 26	05:03 (B0002) 05:29 (B0002) 21:16	04:55 21:01 13	06:01 06:31 (B0007) 18:34	07:04 16:13 15	07:47 (B0004) 08:02 (B0004) 15:20
3	04:06 22:02 26	05:02 (B0002) 05:28 (B0002) 21:14	04:57 21:01 9	06:03 06:33 (B0007) 18:31	07:06 16:11 11	07:50 (B0004) 08:01 (B0004) 15:19
4	04:07 22:01 25	05:03 (B0002) 05:28 (B0002) 21:12	04:59 21:01 6	06:05 06:36 (B0007) 18:28	07:08 16:09 8	07:52 (B0004) 08:00 (B0004) 15:18
5	04:08 22:00 25	05:03 (B0002) 05:28 (B0002) 21:09	05:01 21:09 8	06:07 06:45 (B0022) 18:26	07:10 16:06 4	07:55 (B0004) 08:23 (B0004) 15:17
6	04:09 22:00 24	05:04 (B0002) 05:28 (B0002) 21:07	05:03 21:07 5	06:09 06:43 (B0022) 18:23	07:13 16:04 8	07:59 (B0004) 08:25 (B0009) 15:16
7	04:10 21:59 22	05:05 (B0002) 05:27 (B0002) 21:05	05:05 21:05 8	06:11 06:42 (B0022) 18:20	07:15 16:02 12	07:52 (B0009) 08:04 (B0009) 15:16
8	04:11 21:58 22	05:06 (B0002) 05:28 (B0002) 21:02	05:07 21:02 12	06:13 06:43 (B0006) 18:17	07:17 16:00 14	07:50 (B0009) 08:04 (B0009) 15:15
9	04:12 21:57 20	05:07 (B0002) 05:27 (B0002) 21:00	05:09 21:00 12	06:15 06:45 (B0006) 18:15	07:19 15:57 15	07:49 (B0009) 08:04 (B0009) 15:14
10	04:14 21:56 18	05:08 (B0002) 05:26 (B0002) 20:58	05:12 20:58 14	06:17 06:46 (B0006) 18:12	07:21 15:55 13	07:51 (B0009) 08:04 (B0009) 15:14
11	04:15 21:54 16	05:09 (B0002) 05:25 (B0002) 20:55	05:14 20:55 13	06:20 06:49 (B0006) 18:09	07:23 15:53 10	07:54 (B0009) 08:04 (B0009) 15:13
12	04:17 21:53 15	05:10 (B0002) 05:25 (B0002) 20:53	05:16 20:53 11	06:22 06:50 (B0006) 18:07	07:26 15:51 7	07:56 (B0009) 08:03 (B0009) 15:10
13	04:18 21:52 12	05:12 (B0002) 05:24 (B0002) 20:50	05:18 20:50 8	06:24 06:51 (B0006) 18:04	07:28 15:49 3	07:58 (B0009) 08:01 (B0009) 15:09
14	04:20 21:51 9	05:13 (B0002) 05:22 (B0002) 20:48	05:20 20:48 6	06:26 06:53 (B0006) 18:01	07:30 15:47 13	07:59 (B0009) 08:02 (B0009) 15:08
15	04:21 21:49 16	05:14 (B0002) 05:23 (B0002) 20:45	05:22 20:45 3	06:28 06:55 (B0006) 17:58	07:32 15:45 14	08:01 (B0009) 08:03 (B0009) 15:07
16	04:23 21:48 17	05:15 (B0002) 05:24 (B0002) 20:43	05:24 20:43 28	06:30 06:56 (B0006) 17:56	07:35 15:43 13	08:04 (B0009) 08:04 (B0009) 15:06
17	04:25 21:46 18	05:16 (B0002) 05:25 (B0002) 20:40	05:26 20:40 27	06:32 06:57 (B0006) 17:53	07:37 15:42 11	08:06 (B0009) 08:05 (B0009) 15:05
18	04:26 21:45 19	05:17 (B0002) 05:26 (B0002) 20:38	05:27 20:38 26	06:34 06:58 (B0006) 17:51	07:39 15:40 9	08:08 (B0009) 08:06 (B0009) 15:04
19	04:28 21:43 20	05:18 (B0002) 05:27 (B0002) 20:35	05:29 20:35 26	06:36 06:59 (B0006) 17:48	07:41 15:38 6	08:10 (B0009) 08:07 (B0009) 15:03
20	04:30 21:41 21	05:19 (B0002) 05:28 (B0002) 20:33	05:31 20:33 26	06:38 07:01 (B0013) 17:45	07:43 15:36 4	08:12 (B0009) 08:09 (B0009) 15:02
21	04:31 21:40 22	05:20 (B0002) 05:29 (B0002) 20:30	05:33 20:30 26	06:40 07:03 (B0013) 17:43	07:45 15:35 1	08:14 (B0009) 08:11 (B0009) 15:01
22	04:33 21:38 23	05:21 (B0002) 05:30 (B0002) 20:27	05:35 20:27 23	06:42 07:05 (B0013) 17:41	07:47 15:33 1	08:16 (B0009) 08:13 (B0009) 15:00
23	04:35 21:36 24	05:22 (B0002) 05:31 (B0002) 20:25	05:37 20:25 17	06:44 07:07 (B0013) 17:38	07:49 15:31 1	08:18 (B0009) 08:15 (B0009) 14:59
24	04:37 21:34 25	05:23 (B0002) 05:32 (B0002) 20:22	05:39 20:22 13	06:46 07:09 (B0013) 17:35	07:51 15:29 7	08:20 (B0009) 08:17 (B0009) 14:58
25	04:39 21:33 26	05:24 (B0002) 05:33 (B0002) 20:19	05:41 20:19 10	06:48 07:11 (B0013) 17:33	07:53 15:27 12	08:22 (B0009) 08:19 (B0009) 14:57
26	04:41 21:31 27	05:25 (B0002) 05:34 (B0002) 20:17	05:43 20:17 11	06:50 07:13 (B0013) 17:31	07:55 15:25 15	08:24 (B0009) 08:21 (B0009) 14:56
27	04:43 21:29 28	05:26 (B0002) 05:35 (B0002) 20:14	05:45 20:14 13	06:52 07:15 (B0013) 17:29	07:57 15:23 16	08:26 (B0009) 08:23 (B0009) 14:55
28	04:45 21:27 29	05:27 (B0002) 05:36 (B0002) 20:11	05:47 20:11 14	06:54 07:17 (B0013) 17:27	07:59 15:21 17	08:28 (B0009) 08:25 (B0009) 14:54
29	04:47 21:25 30	05:28 (B0002) 05:37 (B0002) 20:09	05:49 20:09 16	06:56 07:19 (B0013) 17:25	08:01 15:19 18	08:30 (B0009) 08:27 (B0009) 14:53
30	04:49 21:23 31	05:29 (B0002) 05:38 (B0002) 20:06	05:51 20:06 15	06:58 07:21 (B0013) 17:23	08:03 15:17 19	08:32 (B0009) 08:29 (B0009) 14:52
Potential sun hours	538	474	386	321	241	207
Total, worst case	287	182	561	204	154	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,67	0,64	0,59	0,56	
Total reduction	0,26	0,23	0,19	0,15	0,09	
Total, real	74	42	108	30	14	

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:18>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (811)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	08:38 (B0005) 17:29	06:57 19:38	07:09 (B0008) 20:45	04:11 21:46
2	08:43 15:25	08:02 16:26	08:38 (B0005) 17:32	06:54 19:41	07:10 (B0008) 20:47	04:09 21:47
3	08:43 15:26	08:00 16:28	08:39 (B0005) 17:34	06:51 19:43	07:12 (B0008) 20:49	04:08 21:49
4	08:42 15:27	07:58 16:31	08:40 (B0005) 17:36	06:49 19:45	07:01 (B0003) 20:51	04:07 21:50
5	08:42 15:29	07:56 16:33	08:41 (B0005) 17:39	06:46 19:47	07:00 (B0003) 20:52	04:06 21:51
6	08:41 15:30	07:53 16:35	08:44 (B0005) 17:41	06:43 19:49	07:00 (B0003) 20:55	04:05 21:53
7	08:40 15:32	07:51 16:38	08:50 (B0005) 17:43	06:41 19:52	07:15 (B0003) 20:58	04:04 21:54
8	08:40 15:33	07:49 16:40	08:04 (B0004) 17:45	06:38 19:54	07:17 (B0003) 21:00	04:03 21:55
9	08:39 15:35	07:47 16:43	08:02 (B0004) 17:48	06:35 19:56	07:18 (B0003) 21:02	04:03 21:56
10	08:38 15:37	07:44 16:45	08:00 (B0004) 17:50	06:33 19:58	07:18 (B0003) 21:04	04:02 21:57
11	08:37 15:39	07:42 16:47	08:04 (B0004) 17:52	06:31 20:00	07:19 (B0003) 21:06	04:01 21:58
12	08:36 15:41	07:40 16:50	08:07 (B0004) 17:54	06:29 20:03	07:20 (B0003) 21:08	04:00 21:59
13	08:35 15:42	07:37 16:52	08:10 (B0004) 17:57	06:27 20:05	07:21 (B0003) 21:10	04:00 22:00
14	08:34 15:44	07:35 16:54	08:11 (B0004) 17:59	06:25 20:07	07:22 (B0003) 21:13	04:00 22:01
15	08:33 15:46	07:33 16:57	08:13 (B0004) 18:01	06:23 20:09	07:23 (B0003) 21:15	04:00 22:01
16	08:31 15:48	07:30 16:59	08:16 (B0004) 18:03	06:21 20:11	07:24 (B0003) 21:17	04:00 22:02
17	08:30 15:50	07:28 17:01	08:18 (B0004) 18:05	06:19 20:14	07:25 (B0003) 21:19	04:00 22:03
18	08:29 15:52	07:25 17:04	08:19 (B0004) 18:08	06:17 20:16	07:26 (B0003) 21:21	04:00 22:03
19	08:27 15:54	07:23 17:06	08:21 (B0004) 18:10	06:15 20:18	07:27 (B0003) 21:23	04:00 22:04
20	08:26 15:57	07:20 17:09	08:23 (B0004) 18:12	06:13 20:20	07:28 (B0003) 21:25	04:00 22:04
21	08:24 15:59	07:18 17:11	08:25 (B0004) 18:14	06:11 20:22	07:29 (B0003) 21:27	04:00 22:04
22	08:23 16:01	07:15 17:13	08:27 (B0004) 18:16	06:09 20:25	07:30 (B0003) 21:28	04:00 22:04
23	08:21 16:03	07:12 17:16	08:29 (B0004) 18:19	06:07 20:27	07:31 (B0003) 21:30	04:00 22:05
24	08:19 16:05	07:10 17:18	08:31 (B0004) 18:21	06:05 20:29	07:32 (B0003) 21:32	04:00 22:05
25	08:17 16:08	07:07 17:20	08:33 (B0004) 18:23	06:03 20:31	07:33 (B0003) 21:34	04:00 22:05
26	08:16 16:10	07:05 17:22	08:35 (B0004) 18:25	06:01 20:33	07:34 (B0003) 21:36	04:00 22:05
27	08:14 16:12	07:02 17:25	08:37 (B0004) 18:27	05:59 20:35	07:35 (B0003) 21:38	04:00 22:06
28	08:12 16:14	06:59 17:27	08:39 (B0004) 18:30	05:57 20:37	07:36 (B0003) 21:40	04:00 22:06
29	08:10 16:17	06:56 17:30	08:41 (B0004) 18:32	05:55 20:39	07:37 (B0003) 21:42	04:00 22:07
30	08:08 16:19	06:53 17:33	08:43 (B0004) 18:34	05:53 20:41	07:38 (B0003) 21:44	04:00 22:07
31	08:06 16:21	06:50 17:36	08:45 (B0004) 18:36	05:51 20:43	07:39 (B0003) 21:46	04:00 22:08
Potential sun hours	228	262	366	429	515	539
Total, worst case	50	351	200	715	111	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,56	0,59	0,62	0,65	0,69	
Total reduction	0,10	0,09	0,13	0,27	0,36	
Total, real	5	32	27	193	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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:18>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (811)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03	04:53 21:18	05:32 (B0006) 20:01	05:58 20:01	06:30 (B0022) 18:37	07:02 16:15
2	04:05 22:02	04:55 21:16	05:32 (B0006) 19:58	06:01 19:58	06:31 (B0022) 18:34	07:04 16:13
3	04:06 22:02	04:57 21:14	05:32 (B0006) 19:55	06:03 19:55	06:33 (B0022) 18:31	07:06 16:11
4	04:07 22:01	04:59 21:12	05:34 (B0006) 19:52	06:05 19:52	06:35 (B0022) 18:28	07:08 16:09
5	04:08 22:00	05:01 21:09	05:36 (B0006) 19:50	06:07 19:50	06:37 (B0022) 18:26	07:10 16:06
6	04:09 22:00	05:03 21:07	05:38 (B0006) 19:47	06:09 19:47	06:51 (B0003) 18:23	07:13 16:04
7	04:10 21:59	05:05 21:05	05:40 (B0006) 19:44	06:11 19:44	06:53 (B0003) 18:20	07:15 16:02
8	04:11 21:58	05:07 21:02	05:41 (B0006) 19:41	06:13 19:41	06:55 (B0003) 18:17	07:17 16:00
9	04:12 21:57	05:09 21:00	05:42 (B0006) 19:38	06:15 19:38	07:06 (B0003) 18:15	07:19 15:57
10	04:14 21:56	05:12 20:58	06:17 19:36	07:03 (B0008) 18:12	07:21 18:12	07:31 15:55
11	04:15 21:54	05:14 20:55	06:20 19:33	07:15 (B0008) 18:09	07:23 18:09	07:34 15:53
12	04:17 21:53	05:16 20:53	06:22 19:30	07:01 (B0008) 18:07	07:26 18:07	07:36 15:51
13	04:18 21:52	05:18 20:50	06:24 19:27	07:00 (B0008) 18:04	07:28 18:04	07:38 15:49
14	04:20 21:51	05:20 20:48	06:26 19:24	06:59 (B0008) 18:01	07:30 18:01	07:41 15:47
15	04:21 21:49	05:22 20:45	06:28 19:22	07:16 (B0008) 17:58	07:32 17:58	07:43 15:45
16	04:23 21:48	05:24 20:43	06:21 (B0007) 19:19	07:00 (B0008) 17:56	07:35 17:56	08:15 (B0010) 15:43
17	04:25 21:46	05:26 20:40	06:19 (B0007) 19:16	07:15 (B0008) 17:53	08:13 (B0010) 17:53	07:45 15:42
18	04:26 21:45	05:29 20:38	06:18 (B0007) 19:13	07:02 (B0008) 17:51	08:13 (B0010) 17:51	07:47 15:40
19	04:28 21:43	05:31 20:35	06:17 (B0007) 19:10	07:04 (B0008) 17:48	08:12 (B0010) 17:48	07:49 15:38
20	04:30 21:41	05:33 20:33	06:16 (B0007) 19:08	07:06 (B0008) 17:45	08:12 (B0010) 17:45	07:52 15:36
21	04:32 21:40	05:35 20:30	06:16 (B0007) 19:05	07:16 (B0008) 17:43	08:15 (B0010) 17:43	07:54 15:35
22	04:33 21:38	05:37 20:27	06:16 (B0007) 19:02	07:30 (B0008) 17:40	08:20 (B0010) 17:40	07:58 15:33
23	04:35 21:36	05:39 20:25	06:16 (B0007) 18:59	07:48 (B0008) 17:38	08:28 (B0004) 17:38	08:00 15:31
24	04:37 21:34	05:41 20:22	06:16 (B0007) 18:56	07:50 (B0008) 17:35	08:48 (B0004) 17:35	08:02 15:30
25	04:39 21:33	05:44 20:19	06:17 (B0007) 18:53	07:52 (B0008) 17:33	08:48 (B0004) 17:33	08:04 15:29
26	04:41 21:31	05:46 20:17	06:19 (B0007) 18:51	07:54 (B0008) 17:30	08:47 (B0004) 17:30	08:06 15:27
27	04:43 21:29	05:48 20:14	06:50 (B0003) 18:48	07:56 (B0008) 17:28	08:47 (B0004) 17:28	08:08 15:26
28	04:45 21:27	05:50 20:11	06:36 (B0022) 18:45	07:44 (B0009) 17:25	07:32 (B0004) 17:25	08:10 15:24
29	04:47 21:25	6 05:42 (B0006) 05:35 (B0006)	05:52 20:09	07:47 (B0009) 17:23	07:40 (B0009) 17:23	08:12 15:23
30	04:49 21:23	9 05:44 (B0006) 05:45 (B0006)	05:54 20:06	07:50 (B0009) 17:20	07:42 (B0004) 17:20	08:14 15:22
31	04:51 21:20	13 05:45 (B0006)	05:56 20:03	07:51 (B0009) 17:18	07:08 17:18	08:16 15:22
Potential sun hours	538	474	386	321	241	207
Total, worst case	39	542	384	348	131	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,66	0,65	0,59	0,56	
Total reduction	0,26	0,23	0,20	0,15	0,09	
Total, real	10	123	76	52	12	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:19>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (897)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June	
1	08:43 15:23	08:04 16:24	06:57 17:29	07:47 (B0005) 18 08:05 (B0005) 19:38	06:31 25 07:52 (B0004) 20:45	05:46 (B0008) 17 06:03 (B0008) 21:46	05:00 (B0007) 16 05:16 (B0007) 21:46
2	08:43 15:25	08:02 16:26	06:54 17:32	07:48 (B0005) 15 08:03 (B0005) 19:41	06:28 23 07:50 (B0004) 20:47	05:46 (B0008) 18 06:04 (B0008) 21:47	05:00 (B0007) 16 05:16 (B0007) 21:47
3	08:43 15:26	08:00 16:28	06:51 17:34	07:49 (B0005) 12 08:01 (B0005) 19:43	06:26 22 07:50 (B0004) 20:49	05:36 (B0022) 21 06:04 (B0008) 21:49	05:01 (B0007) 15 05:16 (B0007) 21:49
4	08:42 15:27	07:58 16:31	06:49 17:36	07:53 (B0005) 5 07:58 (B0005) 06:23	06:50 (B0009) 28 07:48 (B0004) 20:51	05:34 (B0022) 25 06:04 (B0008) 21:50	05:01 (B0007) 15 05:16 (B0007) 21:50
5	08:42 15:29	07:56 16:33	06:46 17:39	06:46 19:47	05:02 28 07:45 (B0004) 20:53	05:31 (B0022) 28 06:03 (B0008) 21:51	05:01 (B0007) 15 05:16 (B0007) 21:51
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 25 07:42 (B0004) 20:55	05:29 (B0022) 30 06:03 (B0008) 21:53	05:02 (B0007) 15 05:17 (B0007) 21:53
7	08:40 15:32	07:51 16:38	06:41 17:43	06:14 19:52	04:57 17 07:02 (B0009) 20:58	05:29 (B0022) 29 06:02 (B0008) 21:54	05:02 (B0007) 15 05:17 (B0007) 21:54
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 17 07:01 (B0009) 21:00	06:02 (B0008) 27 06:01 (B0008) 21:55	05:02 (B0007) 14 05:16 (B0007) 21:55
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:52 18 07:01 (B0009) 21:02	05:29 (B0022) 25 06:00 (B0008) 21:56	05:03 (B0007) 14 05:17 (B0007) 21:56
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 17 07:01 (B0009) 21:04	05:29 (B0022) 21 05:58 (B0008) 21:57	05:03 (B0007) 13 05:16 (B0007) 21:57
11	08:37 15:39	07:42 16:47	06:30 17:52	06:03 20:00	04:48 16 07:00 (B0009) 21:06	05:29 (B0022) 12 05:41 (B0022) 21:58	05:04 (B0007) 13 05:17 (B0007) 21:58
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 14 06:58 (B0009) 21:08	05:30 (B0022) 10 05:40 (B0022) 21:59	05:03 (B0007) 13 05:16 (B0007) 21:59
13	08:35 15:42	07:37 16:52	06:24 17:57	06:50 (B0010) 9 06:59 (B0010) 20:05	05:58 12 06:57 (B0009) 21:10	05:31 (B0022) 8 05:39 (B0022) 22:00	05:04 (B0007) 12 05:16 (B0007) 22:00
14	08:34 15:44	07:35 16:54	06:21 17:59	06:48 (B0010) 13 07:01 (B0010) 20:07	05:55 8 06:55 (B0009) 21:12	05:33 (B0022) 3 05:36 (B0022) 22:01	05:05 (B0007) 11 05:16 (B0007) 22:01
15	08:33 15:46	07:33 16:57	06:19 18:01	06:46 (B0010) 15 07:01 (B0010) 20:09	05:53 06:45 (B0010) 20:11	04:39 21:15	05:05 (B0007) 12 05:17 (B0007) 21:15
16	08:31 15:48	07:30 16:59	06:16 18:03	06:45 (B0010) 16 07:01 (B0010) 20:11	05:50 20:11	04:37 21:17	05:05 (B0007) 11 05:16 (B0007) 21:17
17	08:30 15:50	07:28 17:01	06:13 18:05	06:45 (B0010) 15 07:00 (B0010) 20:14	05:47 20:14	04:35 21:19	05:05 (B0007) 11 05:16 (B0007) 21:19
18	08:29 15:52	07:25 17:04	06:10 18:08	06:45 (B0010) 14 06:59 (B0010) 20:16	05:45 5 06:17 (B0013) 21:21	04:33 21:21	05:06 (B0007) 10 05:16 (B0007) 21:21
19	08:27 15:54	07:23 17:06	06:07 18:10	06:45 (B0010) 13 06:58 (B0010) 20:18	05:42 9 06:18 (B0013) 21:23	04:31 21:23	05:06 (B0007) 10 05:16 (B0007) 21:23
20	08:26 15:57	07:20 17:09	06:05 18:12	06:47 (B0010) 10 06:57 (B0010) 20:20	05:39 13 06:20 (B0013) 21:25	04:30 21:25	05:07 (B0007) 10 05:17 (B0007) 21:25
21	08:24 15:59	07:18 17:11	06:02 18:14	06:41 (B0004) 11 06:54 (B0010) 20:22	05:37 13 06:19 (B0013) 21:26	04:28 21:26	05:07 (B0007) 10 05:17 (B0007) 21:26
22	08:22 16:01	07:15 17:13	05:59 18:16	06:36 (B0004) 14 06:50 (B0004) 20:25	05:34 14 06:20 (B0013) 21:28	04:26 6 05:11 (B0007) 22:04	05:07 (B0007) 10 05:17 (B0007) 22:04
23	08:21 16:03	07:12 17:16	05:56 18:19	06:34 (B0004) 17 06:51 (B0004) 20:27	05:31 14 06:19 (B0013) 21:30	04:24 9 05:12 (B0007) 22:05	05:07 (B0007) 10 05:17 (B0007) 22:05
24	08:19 16:05	07:10 17:18	05:53 18:21	06:32 (B0004) 20 06:52 (B0004) 20:29	05:29 13 06:19 (B0013) 21:32	04:22 11 05:13 (B0007) 22:05	05:08 (B0007) 10 05:18 (B0007) 22:05
25	08:17 16:08	07:07 17:20	05:51 18:23	06:31 (B0004) 23 06:54 (B0004) 20:31	05:26 11 06:17 (B0013) 21:34	04:21 12 05:13 (B0007) 22:05	05:08 (B0007) 10 05:18 (B0007) 22:05
26	08:16 16:10	07:05 17:22	05:48 18:25	06:30 (B0004) 24 06:54 (B0004) 20:34	05:24 9 06:16 (B0013) 21:36	04:19 13 05:14 (B0007) 22:04	05:08 (B0007) 11 05:19 (B0007) 22:04
27	08:14 16:12	07:02 17:25	05:45 18:27	06:29 (B0004) 25 06:54 (B0004) 20:36	05:21 14 06:14 (B0013) 21:37	04:18 14 05:15 (B0007) 22:04	05:08 (B0007) 11 05:19 (B0007) 22:04
28	08:12 16:14	06:59 17:27	05:42 18:30	06:28 (B0004) 26 06:54 (B0004) 20:38	05:19 13 06:02 (B0008) 21:39	04:16 15 05:15 (B0007) 22:04	05:08 (B0007) 12 05:20 (B0007) 22:04
29	08:10 16:17		06:39 19:32	07:27 (B0004) 26 07:53 (B0004) 20:40	05:16 15 06:03 (B0008) 21:41	04:15 15 05:15 (B0007) 22:04	05:07 (B0007) 12 05:19 (B0007) 22:04
30	08:08 16:19		06:37 19:34	07:27 (B0004) 27 07:54 (B0004) 20:42	05:14 16 06:04 (B0008) 21:42	04:13 16 05:16 (B0007) 22:03	05:08 (B0007) 12 05:20 (B0007) 22:03
31	08:06 16:21		06:34 19:36	07:27 (B0004) 26 07:53 (B0004) 20:42	05:14 21:44	04:12 16 05:16 (B0007) 22:03	05:08 (B0007) 12 05:20 (B0007) 22:03
Potential sun hours	228	263	366	429	515	539	
Total, worst case		182	398	429	401	369	
Sun reduction		0.16	0.22	0.42	0.53	0.43	
Oper. time red.		0.99	0.99	0.99	0.99	0.99	
Wind dir. red.		0.60	0.65	0.65	0.68	0.69	
Total reduction		0.09	0.13	0.27	0.35	0.29	
Total, real		17	54	116	142	106	

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:19>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (897)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

July		August		September		October		November		December	
1	04:04	05:08 (B0007)	04:53	05:40 (B0022)	05:58	06:43 (B0009)	07:02	07:31 (B0010)	07:11	08:16	
2	22:03	13 05:21 (B0007)	21:18	11 05:51 (B0022)	20:00	16 06:59 (B0009)	18:37	6 07:37 (B0010)	16:15	15:21	
3	04:05	05:08 (B0007)	04:55	05:39 (B0022)	06:01	06:42 (B0009)	07:04		07:13	08:18	
4	22:02	13 05:21 (B0007)	21:16	17 06:07 (B0008)	19:58	17 06:59 (B0009)	18:34		16:13	15:20	
5	04:06	05:08 (B0007)	04:57	05:39 (B0022)	06:03	06:41 (B0009)	07:06		07:15	08:20	
6	22:02	14 05:22 (B0007)	21:14	23 06:09 (B0008)	19:55	18 06:59 (B0009)	18:31		16:11	15:19	
7	04:07	05:07 (B0007)	04:59	05:39 (B0022)	06:05	06:41 (B0009)	07:08		07:18	08:21	
8	22:01	14 05:21 (B0007)	21:12	26 06:11 (B0008)	19:52	17 06:58 (B0009)	18:28		16:09	15:18	
9	04:08	05:07 (B0007)	05:01	05:39 (B0022)	06:07	06:41 (B0009)	07:10		07:20	08:23	
10	22:00	15 05:22 (B0007)	21:09	28 06:12 (B0008)	19:49	17 06:58 (B0009)	18:26		16:06	15:17	
11	04:09	05:07 (B0007)	05:03	05:39 (B0022)	06:09	06:42 (B0009)	07:13		07:22	08:25	
12	21:59	15 05:22 (B0007)	21:07	29 06:13 (B0008)	19:47	24 07:38 (B0004)	18:23		16:04	15:16	
13	04:10	05:08 (B0007)	05:05	05:40 (B0022)	06:11	06:42 (B0009)	07:15		07:25	08:26	
14	21:59	15 05:23 (B0007)	21:05	29 06:13 (B0008)	19:44	27 07:40 (B0004)	18:20		16:02	15:16	
15	04:11	05:08 (B0007)	05:07	05:41 (B0022)	06:13	06:44 (B0009)	07:17		07:27	08:28	
16	21:58	16 05:24 (B0007)	21:02	26 06:12 (B0008)	19:41	28 07:42 (B0004)	18:17		16:00	15:15	
17	04:13	05:08 (B0007)	05:09	05:43 (B0022)	06:15	07:22 (B0004)	07:19		07:29	08:29	
18	21:57	16 05:24 (B0007)	21:00	25 06:13 (B0008)	19:38	21 07:43 (B0004)	18:15		15:57	15:15	
19	04:14	05:08 (B0007)	05:12	05:45 (B0022)	06:17	07:20 (B0004)	07:21	08:25 (B0005)	07:31	08:30	
20	21:56	16 05:24 (B0007)	20:58	19 06:12 (B0008)	19:36	24 07:44 (B0004)	18:12	9 08:34 (B0005)	15:55	15:14	
21	04:15	05:08 (B0007)	05:14	05:55 (B0008)	06:20	07:19 (B0004)	07:23	08:23 (B0005)	07:34	08:32	
22	21:54	16 05:24 (B0007)	20:55	17 06:12 (B0008)	19:33	25 07:44 (B0004)	18:09	14 08:37 (B0005)	15:53	15:14	
23	04:17	05:09 (B0007)	05:16	05:55 (B0008)	06:22	07:19 (B0004)	07:26	08:21 (B0005)	07:36	08:33	
24	21:53	16 05:25 (B0007)	20:53	17 06:12 (B0008)	19:30	25 07:44 (B0004)	18:07	17 08:38 (B0005)	15:51	15:13	
25	04:18	05:09 (B0007)	05:18	05:55 (B0008)	06:24	07:18 (B0004)	07:28	08:20 (B0005)	07:38	08:34	
26	21:52	15 05:24 (B0007)	20:50	16 06:11 (B0008)	19:27	26 07:44 (B0004)	18:04	19 08:39 (B0005)	15:49	15:13	
27	04:20	05:08 (B0007)	05:20	05:56 (B0008)	06:26	07:17 (B0004)	07:30	08:19 (B0005)	07:40	08:35	
28	21:51	16 05:24 (B0007)	20:48	14 06:10 (B0008)	19:24	27 07:44 (B0004)	18:01	21 08:40 (B0005)	15:47	15:13	
29	04:21	05:09 (B0007)	05:22	05:57 (B0008)	06:28	07:18 (B0004)	07:32	08:18 (B0005)	07:43	08:36	
30	21:49	16 05:25 (B0007)	20:45	12 06:09 (B0008)	19:22	26 07:44 (B0004)	17:58	22 08:40 (B0005)	15:45	15:13	
31	04:23	05:09 (B0007)	05:24	05:59 (B0008)	06:30	07:18 (B0004)	07:34	08:18 (B0005)	07:45	08:37	
32	21:48	15 05:24 (B0007)	20:43	14 06:22 (B0013)	19:19	26 07:44 (B0004)	17:56	21 08:39 (B0005)	15:43	15:13	
33	04:25	05:10 (B0007)	05:26	06:13 (B0013)	06:32	07:18 (B0004)	07:37	08:18 (B0005)	07:47	08:38	
34	21:46	14 05:24 (B0007)	20:40	10 06:23 (B0013)	19:16	25 07:43 (B0004)	17:53	22 08:40 (B0005)	15:42	15:13	
35	04:26	05:10 (B0007)	05:29	06:12 (B0013)	06:34	07:18 (B0004)	07:39	08:18 (B0005)	07:49	08:39	
36	21:45	13 05:23 (B0007)	20:38	12 06:24 (B0013)	19:13	24 07:42 (B0004)	17:51	21 08:39 (B0005)	15:40	15:13	
37	04:28	05:11 (B0007)	05:31	06:11 (B0013)	06:36	07:19 (B0004)	07:41	08:18 (B0005)	07:52	08:40	
38	21:43	12 05:23 (B0007)	20:35	14 06:25 (B0013)	19:10	21 07:40 (B0004)	17:48	20 08:38 (B0005)	15:38	15:13	
39	04:30	05:12 (B0007)	05:33	06:11 (B0013)	06:38	07:20 (B0004)	07:43	08:19 (B0005)	07:54	08:41	
40	21:41	10 05:22 (B0007)	20:33	14 06:25 (B0013)	19:08	19 07:39 (B0004)	17:45	19 08:38 (B0005)	15:36	15:13	
41	04:32	05:14 (B0007)	05:35	06:11 (B0013)	06:41	07:21 (B0004)	07:46	08:20 (B0005)	07:56	08:41	
42	21:40	7 05:21 (B0007)	20:30	13 06:24 (B0013)	19:05	15 07:36 (B0004)	17:43	16 08:36 (B0005)	15:35	15:14	
43	04:33	05:16 (B0007)	05:37	06:11 (B0013)	06:43	07:24 (B0004)	07:48	08:22 (B0005)	07:58	08:42	
44	21:38	4 05:20 (B0007)	20:27	13 06:24 (B0013)	19:02	9 07:33 (B0004)	17:40	13 08:35 (B0005)	15:33	15:14	
45	04:35		05:39	06:11 (B0013)	06:45	07:31 (B0010)	07:50	08:24 (B0005)	08:00	08:42	
46	21:36		20:25	12 06:23 (B0013)	18:59	9 07:40 (B0010)	17:38	8 08:32 (B0005)	15:32	15:15	
47	04:37		05:41	06:13 (B0013)	06:47	07:29 (B0010)	07:52		08:02	08:43	
48	21:34		20:22	9 06:22 (B0013)	18:56	12 07:41 (B0010)	17:35		15:30	15:15	
49	04:39		05:44	06:15 (B0013)	06:49	07:28 (B0010)	06:55		08:04	08:43	
50	21:32		20:19	5 06:20 (B0013)	18:53	14 07:42 (B0010)	16:33		15:29	15:16	
51	04:41		05:46		06:51	07:28 (B0010)	06:57		08:06	08:43	
52	21:31		20:17		18:51	15 07:43 (B0010)	16:30		15:27	15:17	
53	04:43		05:48		06:53	07:27 (B0010)	06:59		08:08	08:44	
54	21:29		20:14		18:48	16 07:43 (B0010)	16:28		15:26	15:18	
55	04:45		05:50		06:55	07:27 (B0010)	07:02		08:10	08:44	
56	21:27		20:11		18:45	15 07:42 (B0010)	16:25		15:24	15:19	
57	04:47		05:52	06:47 (B0009)	06:58	07:27 (B0010)	07:04		08:12	08:44	
58	21:25		20:09	9 06:56 (B0009)	18:42	14 07:41 (B0010)	16:23		15:23	15:20	
59	04:49	05:43 (B0022)	05:54	06:45 (B0009)	07:00	07:29 (B0010)	07:06		08:14	08:44	
60	21:23	6 05:49 (B0022)	20:06	12 06:57 (B0009)	18:39	11 07:40 (B0010)	16:20		15:22	15:21	
61	04:51	05:41 (B0022)	05:56	06:44 (B0009)			07:08			08:44	
62	21:20	9 05:50 (B0022)	20:03	14 06:58 (B0009)			16:18			15:22	
63	Potential sun hours	538	474		386		321		241	207	
64	Total, worst case	316	460		583		248				
65	Sun reduction	0,38	0,35		0,31		0,26				
66	Oper. time red.	0,99	0,99		0,99		0,99				
67	Wind dir. red.	0,69	0,67		0,63		0,60				
68	Total reduction	0,26	0,23		0,19		0,15				
69	Total, real	82	107		113		37				

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:20>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (982)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	08:46 (B0005) 08:58 (B0005)	06:57 17:29	06:31 19:38	07:08 (B0003) 07:34 (B0003)
2	08:43 15:25	08:02 16:26	08:47 (B0005) 08:57 (B0005)	06:54 17:32	06:28 19:41	07:07 (B0003) 07:34 (B0003)
3	08:43 15:26	08:00 16:28	08:50 (B0005) 08:55 (B0005)	06:51 17:34	06:26 19:43	07:07 (B0003) 07:35 (B0003)
4	08:42 15:27	07:58 16:31		06:49 17:36	06:23 19:45	07:06 (B0003) 07:35 (B0003)
5	08:42 15:29	07:56 16:33		06:46 17:39	06:20 19:47	06:46 (B0022) 07:34 (B0003)
6	08:41 15:30	07:53 16:35		06:43 17:41	06:17 19:49	06:43 (B0022) 07:34 (B0003)
7	08:40 15:32	07:51 16:38		06:41 17:43	06:14 19:52	06:41 (B0022) 07:34 (B0003)
8	08:40 15:33	07:49 16:40		06:38 17:45	06:12 19:54	06:38 (B0022) 07:33 (B0003)
9	08:39 15:35	07:47 16:43	08:17 (B0004) 08:20 (B0004)	06:35 17:48	06:09 19:56	06:38 (B0022) 07:32 (B0003)
10	08:38 15:37	07:44 16:45	08:15 (B0004) 08:23 (B0004)	06:32 17:50	06:06 19:58	06:39 (B0022) 07:32 (B0003)
11	08:37 15:39	07:42 16:47	08:12 (B0004) 08:24 (B0004)	06:30 17:52	06:03 20:00	06:39 (B0022) 07:30 (B0003)
12	08:36 15:41	07:40 16:50	08:10 (B0004) 08:25 (B0004)	06:27 17:54	06:01 20:03	06:42 (B0022) 07:29 (B0003)
13	08:35 15:42	07:37 16:52	08:07 (B0004) 08:26 (B0004)	06:24 17:57	06:00 20:05	06:42 (B0022) 07:28 (B0003)
14	08:34 15:44	07:35 16:54	08:06 (B0004) 08:26 (B0004)	06:21 17:59	05:55 20:07	06:23 (B0007) 07:25 (B0003)
15	08:33 15:46	07:33 16:57	08:07 (B0004) 08:26 (B0004)	06:19 18:01	05:53 20:09	06:21 (B0007) 07:22 (B0003)
16	08:31 15:48	07:30 16:59	08:06 (B0004) 08:26 (B0004)	06:16 18:03	05:50 20:11	06:20 (B0007) 06:35 (B0007)
17	08:30 15:50	07:28 17:01	08:07 (B0010) 08:26 (B0004)	06:13 18:05	05:47 20:14	06:19 (B0007) 06:35 (B0007)
18	08:29 15:52	07:25 17:04	08:04 (B0010) 08:26 (B0004)	06:10 18:08	05:45 20:16	06:20 (B0007) 06:35 (B0007)
19	08:27 15:54	07:23 17:06	08:01 (B0010) 08:24 (B0004)	06:07 18:10	05:42 20:18	06:19 (B0007) 06:34 (B0007)
20	08:26 15:57	07:20 17:09	08:00 (B0010) 08:24 (B0004)	06:05 18:12	05:39 20:20	06:20 (B0007) 06:34 (B0007)
21	08:24 15:59	07:18 17:11	08:00 (B0010) 08:22 (B0004)	06:02 18:14	05:37 20:22	06:20 (B0007) 06:33 (B0007)
22	08:23 16:01	07:15 17:13	08:00 (B0010) 08:18 (B0004)	05:59 18:16	05:34 20:25	06:21 (B0007) 06:32 (B0007)
23	08:21 16:03	08:56 (B0005) 08:57 (B0005)	07:12 17:16	05:56 18:19	05:31 20:27	06:22 (B0007) 06:29 (B0007)
24	08:19 16:05	08:54 (B0005) 08:58 (B0005)	07:10 17:18	05:53 18:21	05:29 20:29	06:19 (B0008) 06:35 (B0008)
25	08:17 16:08	08:52 (B0005) 08:58 (B0005)	07:07 17:20	05:51 18:23	05:26 20:31	06:17 (B0013) 06:35 (B0008)
26	08:16 16:10	08:50 (B0005) 08:59 (B0005)	07:05 17:22	05:48 18:25	05:24 20:34	06:17 (B0013) 06:35 (B0008)
27	08:14 16:12	08:48 (B0005) 09:00 (B0005)	07:02 17:25	05:45 18:27	05:21 20:36	06:18 (B0008) 06:34 (B0008)
28	08:12 16:14	08:45 (B0005) 08:59 (B0005)	06:59 17:27	05:42 18:30	05:19 20:38	06:18 (B0008) 06:33 (B0008)
29	08:10 16:17	08:44 (B0005) 08:59 (B0005)		06:39 19:32	05:16 20:40	07:14 (B0003) 07:31 (B0008)
30	08:08 16:19	08:44 (B0005) 08:59 (B0005)		06:37 19:34	05:14 20:42	07:12 (B0003) 07:32 (B0003)
31	08:06 16:21	08:45 (B0005) 08:59 (B0005)		06:34 19:36	05:14 20:42	07:10 (B0003) 07:33 (B0003)
Potential sun hours	228	262	366	429	515	539
Total, worst case	90	285	259	587	103	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,56	0,59	0,62	0,65	0,69	
Total reduction	0,10	0,09	0,14	0,27	0,35	
Total, real	9	26	35	158	37	

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:20>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (982)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December
1	04:04 22:03	04:53 21:18	05:41 (B0006) 20:01	06:38 (B0022) 18:37	07:11 16:15	07:45 (B0004) 15:21
2	04:05 22:02	04:55 21:16	05:40 (B0006) 19:58	06:37 (B0022) 18:34	07:13 16:13	07:47 (B0004) 15:20
3	04:06 22:02	04:57 21:14	05:39 (B0006) 19:55	06:36 (B0022) 18:31	07:15 16:11	07:49 (B0004) 15:19
4	04:07 22:01	04:59 21:12	05:38 (B0006) 19:52	06:35 (B0022) 18:28	07:18 16:09	07:44 (B0009) 15:18
5	04:08 22:00	05:01 21:09	05:38 (B0006) 19:50	06:37 (B0022) 18:26	07:20 16:06	07:43 (B0009) 15:17
6	04:09 22:00	05:03 21:07	05:38 (B0006) 19:47	06:39 (B0022) 18:23	07:22 16:04	07:42 (B0009) 15:16
7	04:10 21:59	05:05 21:05	05:40 (B0006) 19:44	06:41 (B0022) 18:20	07:25 16:02	07:45 (B0009) 15:16
8	04:11 21:58	05:07 21:02	05:41 (B0006) 19:41	07:00 (B0003) 18:17	07:27 16:00	07:47 (B0009) 15:15
9	04:12 21:57	05:09 21:00	05:43 (B0006) 19:38	07:00 (B0003) 18:15	07:29 15:57	07:49 (B0009) 15:14
10	04:14 21:56	05:12 20:58	05:45 (B0006) 19:36	07:00 (B0003) 18:12	07:31 15:55	07:51 (B0009) 15:13
11	04:15 21:54	05:14 20:55	05:47 (B0006) 19:33	07:01 (B0003) 18:09	07:34 15:53	07:53 (B0009) 15:12
12	04:17 21:53	05:16 20:53	06:22 19:30	07:01 (B0003) 18:07	07:36 15:51	08:16 (B0005) 15:11
13	04:18 21:52	05:18 20:50	06:24 19:27	07:02 (B0003) 18:04	07:38 15:49	08:16 (B0005) 15:10
14	04:20 21:51	05:20 20:48	06:26 19:24	07:04 (B0003) 18:01	07:41 15:47	08:18 (B0005) 15:09
15	04:21 21:49	05:22 20:45	06:28 19:22	07:08 (B0003) 17:58	07:43 15:45	08:20 (B0005) 15:08
16	04:23 21:48	05:24 20:43	06:30 19:19	07:07 (B0013) 17:56	07:45 15:43	08:23 (B0005) 15:07
17	04:25 21:46	05:26 20:40	06:32 19:16	07:06 (B0013) 17:53	07:47 15:42	08:25 (B0005) 15:06
18	04:26 21:45	05:29 20:38	06:34 19:13	07:05 (B0013) 17:51	07:49 15:40	08:28 (B0005) 15:05
19	04:28 21:43	05:31 20:35	06:36 19:10	07:06 (B0008) 17:48	07:52 15:38	08:30 (B0005) 15:04
20	04:30 21:41	05:33 20:33	06:38 19:08	07:08 (B0008) 17:45	07:54 15:36	08:31 (B0005) 15:03
21	04:32 21:40	05:35 20:30	06:25 (B0007) 19:05	07:10 (B0008) 17:43	08:17 (B0010) 15:35	08:41 15:14
22	04:33 21:38	05:37 20:27	06:24 (B0007) 19:02	07:12 (B0008) 17:40	08:20 (B0010) 15:33	08:42 15:13
23	04:35 21:36	05:39 20:25	06:23 (B0007) 18:59	07:18 (B0008) 17:38	08:54 (B0004) 15:31	08:43 15:12
24	04:37 21:34	05:41 20:22	06:23 (B0007) 18:56	07:52 17:35	08:25 (B0010) 15:30	08:44 15:11
25	04:39 21:33	05:44 20:19	06:22 (B0007) 18:53	06:55 16:33	07:27 (B0010) 15:29	08:45 15:10
26	04:41 21:31	05:46 20:17	06:22 (B0007) 18:51	06:57 16:30	07:36 (B0004) 15:27	08:46 15:09
27	04:43 21:29	05:48 20:14	06:22 (B0007) 18:48	06:59 16:28	07:36 (B0004) 15:26	08:47 15:08
28	04:45 21:27	05:50 20:11	06:23 (B0007) 18:45	07:02 16:25	07:36 (B0004) 15:24	08:48 15:07
29	04:47 21:25	05:52 20:09	06:24 (B0007) 18:42	07:04 16:23	07:37 (B0004) 15:23	08:49 15:06
30	04:49 21:23	05:54 20:06	06:26 (B0007) 18:40	07:06 16:20	07:39 (B0004) 15:22	08:50 15:05
31	04:51 21:20	05:56 20:03	06:41 (B0022) 07:29 (B0003)	07:08 16:18	07:42 (B0004) 15:21	08:51 15:20
Potential sun hours	538	474	386	321	241	207
Total, worst case		323	549	343	127	
Sun reduction		0,35	0,31	0,26	0,17	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,66	0,65	0,59	0,56	
Total reduction		0,23	0,20	0,15	0,09	
Total, real		74	108	51	12	

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:22>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (825)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	08:48 (B0005) 17:29	06:57 17:29	06:31 19:38	07:12 (B0003) 20:45
2	08:43 15:25	08:02 16:26	08:51 (B0005) 17:32	06:54 17:32	06:28 19:41	07:11 (B0003) 20:47
3	08:43 15:26	08:00 16:28	06:51 17:34	07:18 (B0009) 19:43	06:26 19:41	07:11 (B0003) 20:47
4	08:42 15:27	07:58 16:31	06:49 17:36	07:16 (B0009) 19:45	06:23 19:45	06:49 (B0022) 20:51
5	08:42 15:29	07:56 16:33	06:46 17:39	07:13 (B0009) 19:47	06:20 19:47	06:46 (B0022) 20:53
6	08:41 15:30	07:53 16:35	06:43 17:41	07:10 (B0009) 19:49	06:17 19:49	06:43 (B0022) 20:55
7	08:40 15:32	07:51 16:38	06:41 17:43	07:08 (B0009) 19:52	06:14 19:52	06:41 (B0022) 20:58
8	08:40 15:33	07:49 16:40	08:20 (B0004) 17:45	06:38 17:45	06:12 19:54	06:41 (B0022) 21:00
9	08:39 15:35	07:47 16:43	08:17 (B0004) 17:48	06:35 17:48	07:22 (B0009) 19:56	06:37 (B0003) 21:02
10	08:38 15:37	07:44 16:45	08:15 (B0004) 17:50	06:32 17:50	07:11 (B0009) 19:58	06:43 (B0022) 21:04
11	08:37 15:39	07:42 16:47	08:12 (B0004) 17:52	06:30 17:52	07:08 (B0009) 20:00	06:41 (B0022) 21:06
12	08:36 15:41	07:40 16:50	08:10 (B0004) 17:54	06:27 17:54	07:22 (B0009) 20:03	06:37 (B0003) 21:08
13	08:35 15:42	07:37 16:52	08:09 (B0004) 17:57	06:24 17:57	07:11 (B0009) 20:05	06:43 (B0022) 21:10
14	08:34 15:44	07:35 16:54	08:09 (B0004) 17:59	06:21 17:59	07:23 (B0003) 20:07	06:24 (B0007) 21:13
15	08:33 15:46	07:33 16:57	08:09 (B0004) 18:01	06:19 18:01	07:28 (B0003) 20:09	06:23 (B0007) 21:15
16	08:31 15:48	07:30 16:59	07:59 (B0010) 18:03	06:16 18:03	06:23 (B0007) 20:11	06:37 (B0007) 21:17
17	08:30 15:50	07:28 17:01	07:57 (B0010) 18:05	06:13 18:05	06:22 (B0007) 20:14	06:36 (B0007) 21:19
18	08:29 15:52	07:25 17:04	07:54 (B0010) 18:08	06:10 18:08	06:38 (B0007) 20:16	06:23 (B0007) 21:21
19	08:27 15:54	07:23 17:06	07:51 (B0010) 18:10	06:07 18:10	06:23 (B0007) 20:18	06:37 (B0007) 21:23
20	08:26 15:57	07:20 17:09	08:25 (B0004) 18:12	06:05 18:12	06:37 (B0008) 20:20	06:24 (B0007) 21:25
21	08:24 15:59	07:18 17:11	08:24 (B0004) 18:14	06:02 18:14	06:28 (B0008) 20:22	06:36 (B0007) 21:27
22	08:23 16:01	07:15 17:13	07:51 (B0010) 18:16	05:59 18:16	06:25 (B0008) 20:25	06:29 (B0007) 21:28
23	08:21 16:03	08:56 (B0005) 17:16	07:12 18:19	05:56 18:19	06:22 (B0008) 20:27	06:30 (B0007) 21:30
24	08:19 16:05	08:54 (B0005) 17:18	07:10 18:21	05:53 18:21	06:19 (B0013) 20:29	06:28 (B0008) 21:32
25	08:17 16:08	08:52 (B0005) 17:20	07:07 18:23	05:51 18:23	06:19 (B0013) 20:31	06:28 (B0008) 21:34
26	08:16 16:10	08:50 (B0005) 17:22	07:05 18:25	05:48 18:25	06:20 (B0013) 20:34	06:38 (B0008) 21:36
27	08:14 16:12	08:48 (B0005) 17:25	07:02 18:27	05:45 18:27	06:19 (B0003) 20:36	06:37 (B0003) 21:38
28	08:12 16:14	08:45 (B0005) 17:27	06:59 18:30	05:42 18:30	06:17 (B0003) 20:38	06:35 (B0003) 21:40
29	08:10 16:17	08:45 (B0005) 17:27	06:59 19:32	05:42 19:32	06:17 (B0003) 20:40	06:35 (B0003) 21:42
30	08:08 16:19	08:46 (B0005) 17:27	06:59 19:34	05:42 19:34	07:14 (B0003) 20:42	06:35 (B0003) 21:44
31	08:06 16:21	08:48 (B0005) 17:27	06:59 19:36	05:42 19:36	07:13 (B0003) 20:42	06:35 (B0003) 21:44
Potential sun hours	228	262	366	429	515	539
Total, worst case	96	258	302	501	95	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,56	0,59	0,63	0,65	0,68	
Total reduction	0,10	0,09	0,14	0,27	0,35	
Total, real	10	24	41	134	34	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:22>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (825)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03	04:53 21:18	05:58 20:01	07:13 (B0003) 18:37	07:11 16:15	07:45 (B0004) 15:21
2	04:05 22:02	04:55 21:16	05:46 (B0006) 19:58	06:41 (B0022) 18:34	07:13 16:13	07:47 (B0004) 15:20
3	04:06 22:02	04:57 21:14	05:44 (B0006) 19:55	06:39 (B0022) 18:31	07:15 16:11	07:50 (B0004) 15:19
4	04:07 22:01	04:59 21:12	05:42 (B0006) 19:52	06:38 (B0022) 18:28	07:18 16:09	07:52 (B0004) 15:18
5	04:08 22:00	05:01 21:09	05:42 (B0006) 19:50	06:37 (B0022) 18:26	07:20 16:06	07:58 (B0009) 15:17
6	04:09 22:00	05:03 21:07	05:41 (B0006) 19:47	06:39 (B0022) 18:23	07:22 16:04	07:59 (B0009) 15:16
7	04:10 21:59	05:05 21:05	05:41 (B0006) 19:44	06:41 (B0022) 18:20	07:25 16:02	07:59 (B0009) 15:16
8	04:11 21:58	05:07 21:02	05:41 (B0006) 19:41	06:43 (B0022) 18:17	07:27 16:00	08:00 (B0009) 15:15
9	04:12 21:57	05:09 21:00	05:43 (B0006) 19:38	06:45 (B0022) 18:15	07:29 15:57	08:21 (B0005) 15:14
10	04:14 21:56	05:12 20:58	05:45 (B0006) 19:36	07:04 (B0003) 18:12	07:31 15:55	08:27 (B0005) 15:13
11	04:15 21:54	05:14 20:55	05:53 (B0006) 19:33	07:33 (B0003) 18:09	07:34 15:53	08:30 (B0005) 15:14
12	04:17 21:53	05:16 20:53	05:49 (B0006) 19:30	07:34 (B0003) 18:07	07:36 15:51	08:31 (B0005) 15:13
13	04:18 21:52	05:18 20:50	05:51 (B0006) 19:27	07:35 (B0003) 18:04	07:38 15:49	08:32 (B0005) 15:13
14	04:20 21:51	05:20 20:48	06:26 19:24	07:31 (B0003) 18:01	07:41 15:47	08:33 (B0005) 15:13
15	04:21 21:49	05:22 20:45	06:28 19:22	07:29 (B0003) 17:58	07:43 15:45	08:34 (B0005) 15:13
16	04:23 21:48	05:24 20:43	06:30 19:19	07:28 (B0003) 17:56	07:45 15:43	08:35 (B0005) 15:13
17	04:25 21:46	05:26 20:40	06:32 19:16	07:27 (B0003) 17:53	07:47 15:42	08:36 (B0005) 15:13
18	04:26 21:45	05:29 20:38	06:34 19:13	07:26 (B0008) 17:51	07:49 15:40	08:37 (B0005) 15:13
19	04:28 21:43	05:31 20:35	06:36 19:10	07:27 (B0013) 17:48	07:52 15:38	08:38 (B0005) 15:13
20	04:30 21:41	05:33 20:33	06:38 19:08	07:25 (B0008) 17:45	08:21 (B0010) 15:36	08:41 (B0005) 15:13
21	04:32 21:40	05:35 20:30	06:32 (B0007) 19:05	07:10 (B0008) 17:43	08:20 (B0010) 15:35	08:42 (B0005) 15:14
22	04:33 21:38	05:37 20:27	06:29 (B0007) 19:02	07:12 (B0008) 17:40	08:20 (B0010) 15:33	08:43 (B0005) 15:14
23	04:35 21:36	05:39 20:25	06:27 (B0007) 18:59	07:14 (B0008) 17:38	08:22 (B0010) 15:31	08:44 (B0005) 15:15
24	04:37 21:34	05:41 20:22	06:26 (B0007) 18:56	07:21 (B0008) 17:35	08:25 (B0010) 15:30	08:45 (B0005) 15:15
25	04:39 21:33	05:44 20:19	06:26 (B0007) 18:53	07:18 (B0008) 17:33	08:27 (B0010) 15:29	08:46 (B0005) 15:16
26	04:41 21:31	05:46 20:17	06:25 (B0007) 18:51	06:57 16:30	08:06 15:27	08:47 (B0005) 15:17
27	04:43 21:29	05:48 20:14	06:25 (B0007) 18:48	06:59 16:28	08:08 15:26	08:48 (B0005) 15:18
28	04:45 21:27	05:50 20:11	06:25 (B0007) 18:45	07:02 16:25	08:10 15:24	08:49 (B0005) 15:19
29	04:47 21:25	05:52 20:09	06:25 (B0007) 18:42	07:04 16:23	08:12 15:23	08:50 (B0005) 15:20
30	04:49 21:23	05:54 20:06	06:26 (B0007) 18:40	07:06 16:20	08:14 15:22	08:51 (B0005) 15:21
31	04:51 21:20	05:56 20:03	06:27 (B0007) 18:38	07:08 16:18	08:16 15:21	08:52 (B0005) 15:22
Potential sun hours	538	474	386	321	241	207
Total, worst case		252	579	315	132	
Sun reduction		0,35	0,31	0,26	0,17	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,67	0,64	0,59	0,56	
Total reduction		0,23	0,20	0,15	0,09	
Total, real		58	113	47	12	

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:23>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (884)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June			
1	08:43 15:23	08:04 16:24	06:57 17:29	06:31 19:38	07:00 (B0010) 14 07:14 (B0010)	05:11 20:45	05:58 (B0009) 35 06:35 (B0004)	04:11 21:46	05:12 (B0008) 10 05:22 (B0008)
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	06:59 (B0010) 15 07:14 (B0010)	05:09 20:47	05:59 (B0009) 32 06:35 (B0004)	04:09 21:47	05:13 (B0008) 8 05:21 (B0008)
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	06:59 (B0010) 15 07:14 (B0010)	05:06 20:49	06:01 (B0009) 26 06:34 (B0004)	04:08 21:49	05:14 (B0008) 6 05:20 (B0008)
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	06:59 (B0010) 14 07:13 (B0010)	05:04 20:51	06:16 (B0004) 17 06:33 (B0004)	04:07 21:50	05:15 (B0008) 4 05:19 (B0008)
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	06:59 (B0010) 13 07:12 (B0010)	05:02 20:53	06:16 (B0004) 14 06:30 (B0004)	04:06 21:51	
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	07:00 (B0010) 10 07:10 (B0010)	04:59 20:55	06:18 (B0004) 10 06:28 (B0004)	04:05 21:53	
7	08:40 15:32	07:51 16:38	06:41 17:43	06:14 19:52	07:02 (B0010) 6 07:08 (B0010)	04:57 20:58		04:04 21:54	
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54		04:55 21:00		04:03 21:55	
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56		04:52 21:02		04:03 21:56	
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58		04:50 21:04		04:02 21:57	
11	08:37 15:39	07:42 16:47	06:30 17:52	06:03 20:00		04:48 21:06		04:01 21:58	
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03		04:46 21:08		04:01 21:59	
13	08:35 15:42	07:37 16:52	06:24 17:57	05:58 20:05		04:44 21:10		04:00 22:00	
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07		04:42 21:12		04:00 22:01	
15	08:32 15:46	07:32 16:57	06:19 18:01	05:53 20:09	06:52 (B0005) 5 06:57 (B0005)	04:39 21:15	05:13 (B0008) 5 05:18 (B0008)	03:59 22:01	
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	06:48 (B0005) 12 07:00 (B0005)	04:37 21:17	05:12 (B0008) 9 05:21 (B0008)	03:59 22:02	
17	08:30 15:50	07:28 17:02	06:13 18:05	05:47 20:14	06:46 (B0005) 16 07:02 (B0005)	04:35 21:19	05:10 (B0008) 12 05:22 (B0008)	03:59 22:03	
18	08:29 15:52	07:25 17:04	06:10 18:08	05:45 20:16	06:44 (B0005) 18 07:02 (B0005)	04:33 21:21	05:09 (B0008) 13 05:22 (B0008)	03:59 22:03	
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	06:42 (B0005) 21 07:03 (B0005)	04:32 21:23	05:09 (B0008) 15 05:24 (B0008)	03:59 22:04	04:42 (B0007) 1 04:43 (B0007)
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	06:42 (B0005) 22 07:04 (B0005)	04:30 21:25	05:08 (B0008) 16 05:24 (B0008)	03:59 22:04	04:43 (B0007) 2 04:45 (B0007)
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:22	06:42 (B0005) 21 07:03 (B0005)	04:28 21:26	05:08 (B0008) 15 05:23 (B0008)	03:59 22:04	04:43 (B0007) 2 04:45 (B0007)
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:25	06:41 (B0005) 22 07:03 (B0005)	04:26 21:28	05:08 (B0008) 16 05:24 (B0008)	03:59 22:04	04:43 (B0007) 2 04:45 (B0007)
23	08:21 16:03	07:12 17:16	05:56 18:19	05:31 20:27	06:41 (B0005) 21 07:02 (B0005)	04:24 21:30	05:08 (B0008) 16 05:24 (B0008)	03:59 22:04	04:43 (B0007) 2 04:45 (B0007)
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	06:41 (B0005) 20 07:01 (B0005)	04:23 21:32	05:08 (B0008) 16 05:24 (B0008)	04:00 22:05	
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	06:42 (B0005) 19 07:01 (B0005)	04:21 21:34	05:08 (B0008) 16 05:24 (B0008)	04:00 22:05	
26	08:16 16:10	07:05 17:22	05:48 18:25	05:24 20:33	06:42 (B0005) 17 06:59 (B0005)	04:19 21:36	05:08 (B0008) 16 05:24 (B0008)	04:00 22:04	
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	06:43 (B0005) 14 06:57 (B0005)	04:18 21:37	05:09 (B0008) 15 05:24 (B0008)	04:01 22:04	
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	06:45 (B0005) 9 06:54 (B0005)	04:16 21:39	05:10 (B0008) 14 05:24 (B0008)	04:02 22:04	
29	08:10 16:17		06:39 19:32	05:16 20:40	07:05 (B0010) 5 07:10 (B0010)	04:15 21:41	05:09 (B0008) 14 05:23 (B0008)	04:02 22:04	
30	08:08 16:19		06:37 19:34	05:14 20:42	07:03 (B0010) 10 07:13 (B0010)	04:13 21:42	05:10 (B0008) 13 05:23 (B0008)	04:03 22:03	
31	08:06 16:21		06:34 19:36	07:01 (B0010) 13 07:14 (B0010)		04:12 21:44	05:11 (B0008) 11 05:22 (B0008)		
Potential sun hours	228	263	366	429	515	539			
Total, worst case			265	465		366			37
Sun reduction			0,22	0,42		0,53			0,43
Oper. time red.			0,99	0,99		0,99			0,99
Wind dir. red.			0,62	0,66		0,68			0,69
Total reduction			0,14	0,27		0,35			0,29
Total, real			36	128		130			11

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:23>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (884)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:16	08:16 15:21
2	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	08:21 15:18
5	04:08 22:00	05:01 21:09	06:07 19:49	06:58 (B0010) 07:04 (B0010)	07:10 18:26	07:20 16:06
6	04:09 21:59	05:03 21:07	06:09 19:47	06:56 (B0010) 07:06 (B0010)	07:13 18:23	07:22 16:04
7	04:10 21:59	05:05 21:05	06:11 19:44	06:54 (B0010) 07:07 (B0010)	07:15 18:20	07:25 16:02
8	04:11 21:58	05:07 21:02	06:13 19:41	06:53 (B0010) 07:07 (B0010)	07:17 18:17	07:27 16:00
9	04:13 21:57	05:10 21:00	06:15 19:38	06:52 (B0010) 07:07 (B0010)	07:19 18:15	07:29 15:58
10	04:14 21:55	05:12 20:58	06:17 19:36	06:52 (B0010) 07:07 (B0010)	07:21 18:12	07:31 15:55
11	04:15 21:54	05:14 20:55	06:20 19:33	06:52 (B0010) 07:06 (B0010)	07:23 18:09	07:34 15:53
12	04:17 21:53	05:16 20:53	06:22 19:30	06:52 (B0010) 07:05 (B0010)	07:26 18:07	07:36 15:51
13	04:18 21:52	05:18 20:50	06:24 19:27	06:53 (B0010) 07:04 (B0010)	07:28 18:04	07:38 15:49
14	04:20 21:51	05:20 20:48	06:26 19:24	06:55 (B0010) 07:01 (B0010)	07:30 18:01	07:40 15:47
15	04:21 21:49	05:22 20:45	06:28 19:22	07:36 (B0005) 07:43 (B0005)	07:32 17:58	07:43 15:45
16	04:23 21:48	05:24 20:43	06:30 19:19	07:33 (B0005) 07:46 (B0005)	07:34 17:56	07:45 15:44
17	04:25 21:46	05:27 20:40	06:32 19:16	07:31 (B0005) 07:47 (B0005)	07:37 17:53	07:47 15:42
18	04:26 21:45	05:29 20:38	06:34 19:13	07:29 (B0005) 07:48 (B0005)	07:39 17:51	07:49 15:40
19	04:28 21:43	05:31 20:35	06:36 19:10	07:28 (B0005) 07:49 (B0005)	07:41 17:48	07:52 15:38
20	04:30 21:41	05:33 20:33	06:38 19:08	07:27 (B0005) 07:49 (B0005)	07:43 17:45	07:54 15:36
21	04:32 21:40	05:35 20:30	06:41 19:05	07:27 (B0005) 07:48 (B0005)	07:46 17:43	07:56 15:35
22	04:33 21:38	05:37 20:27	06:43 19:02	07:26 (B0005) 07:48 (B0005)	07:48 17:40	07:58 15:33
23	04:35 21:36	05:39 20:25	06:45 18:59	07:26 (B0005) 07:47 (B0005)	07:50 17:38	08:00 15:32
24	04:37 21:34	05:41 20:22	06:47 18:56	07:26 (B0005) 07:47 (B0005)	07:52 17:35	08:02 15:30
25	04:39 21:32	05:44 20:19	06:49 18:53	07:26 (B0005) 07:45 (B0005)	06:55 16:33	08:04 15:29
26	04:41 21:31	05:46 20:17	06:51 18:51	07:28 (B0005) 07:45 (B0005)	06:57 16:30	08:06 15:27
27	04:43 21:29	05:48 20:14	06:53 18:48	07:29 (B0005) 07:43 (B0005)	06:59 16:28	08:08 15:26
28	04:45 21:27	05:50 20:11	06:55 18:45	07:31 (B0005) 07:40 (B0005)	07:02 16:25	08:10 15:25
29	04:47 21:25	05:52 20:09	06:58 18:42	07:04 16:23	08:12 15:23	08:44 15:20
30	04:49 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:44 15:21
31	04:51 21:20	05:56 20:03		07:08 16:18		08:44 15:22
Potential sun hours	538	474	386	321	241	207
Total, worst case	257	518	359			
Sun reduction	0,38	0,35	0,31			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,66	0,63			
Total reduction	0,26	0,23	0,19			
Total, real	67	119	69			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:24>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (824)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	06:57 17:29	07:24 (B0009) 06:31 17:29 19:38	07:20 (B0003) 05:11 17:48 (B0003) 20:45	04:11 15:49 (B0006) 21:46
2	08:43 15:25	08:02 16:26	06:54 17:32	07:21 (B0009) 06:28 17:27 (B0009) 19:41	06:54 (B0022) 05:09 17:47 (B0003) 20:47	04:09 15:50 (B0006) 21:47
3	08:43 15:26	08:00 16:28	06:51 17:34	07:18 (B0009) 06:26 17:27 (B0009) 19:43	06:52 (B0022) 05:06 17:47 (B0003) 20:49	04:08 15:50 (B0006) 21:49
4	08:42 15:27	07:58 16:31	06:49 17:36	07:16 (B0009) 06:23 17:28 (B0009) 19:45	06:49 (B0022) 05:04 17:46 (B0003) 20:51	04:07 15:50 (B0006) 21:50
5	08:42 15:29	07:56 16:33	06:46 17:39	07:13 (B0009) 06:20 17:28 (B0009) 19:47	06:46 (B0022) 05:02 17:44 (B0003) 20:53	04:06 15:48 (B0006) 21:51
6	08:41 15:30	07:53 16:35	06:43 17:41	07:13 (B0009) 06:17 17:27 (B0009) 19:49	06:45 (B0022) 04:59 17:42 (B0003) 20:55	04:05 15:47 (B0006) 21:53
7	08:40 15:32	07:51 16:38	06:41 17:43	07:13 (B0009) 06:14 17:26 (B0009) 19:52	06:46 (B0022) 04:57 17:40 (B0003) 20:58	04:04 15:46 (B0006) 21:54
8	08:40 15:33	07:49 16:40	06:38 17:45	07:14 (B0009) 06:12 17:24 (B0009) 19:54	06:47 (B0022) 04:55 17:36 (B0003) 21:00	04:03 15:43 (B0006) 21:55
9	08:39 15:35	07:47 16:43	06:35 17:48	07:18 (B0009) 06:09 17:21 (B0009) 19:56	06:36 (B0007) 04:52 16:39 (B0007) 21:02	04:03 15:46 (B0002) 21:56
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	06:33 (B0007) 04:50 16:43 (B0007) 21:04	04:02 15:47 (B0002) 21:57
11	08:37 15:39	07:42 16:47	06:30 17:52	06:03 20:00	06:31 (B0007) 04:48 16:43 (B0007) 21:06	04:01 15:48 (B0002) 21:58
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	06:29 (B0007) 04:46 16:44 (B0007) 21:08	04:01 15:49 (B0002) 21:59
13	08:35 15:42	07:37 16:52	06:24 17:57	05:58 20:05	06:29 (B0007) 04:44 16:44 (B0007) 21:10	04:00 15:50 (B0002) 22:00
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	06:28 (B0007) 04:41 16:44 (B0007) 21:13	04:00 15:51 (B0002) 22:01
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	06:28 (B0007) 04:39 16:43 (B0007) 21:15	03:59 15:52 (B0002) 22:01
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	06:28 (B0007) 04:37 16:43 (B0007) 21:17	03:59 15:53 (B0002) 22:02
17	08:30 15:50	07:28 17:01	06:13 18:05	05:47 20:14	06:28 (B0007) 04:35 16:42 (B0007) 21:19	03:59 15:54 (B0002) 22:03
18	08:29 15:52	07:25 17:04	06:10 18:08	05:45 20:16	06:30 (B0007) 04:33 16:40 (B0007) 21:21	03:59 15:55 (B0002) 22:03
19	08:27 15:54	07:23 17:06	06:07 18:10	05:42 20:18	06:31 (B0007) 04:31 16:38 (B0007) 21:23	03:59 15:56 (B0002) 22:04
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	06:30 (B0007) 04:30 16:37 (B0007) 21:25	03:59 15:57 (B0002) 22:04
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:22	06:29 (B0007) 04:28 16:36 (B0007) 21:27	03:59 15:58 (B0002) 22:04
22	08:23 16:01	07:15 17:13	05:59 18:16	05:34 20:25	06:28 (B0007) 04:26 16:35 (B0007) 21:28	03:59 15:59 (B0002) 22:04
23	08:21 16:03	07:12 17:16	05:56 18:19	05:31 20:27	06:27 (B0007) 04:24 16:34 (B0007) 21:30	03:59 16:00 (B0002) 22:05
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	06:26 (B0007) 04:22 16:33 (B0007) 21:32	04:00 16:01 (B0002) 22:05
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	06:25 (B0007) 04:21 16:32 (B0007) 21:34	04:00 16:02 (B0002) 22:05
26	08:16 16:10	07:05 17:22	05:48 18:25	05:24 20:34	06:24 (B0007) 04:19 16:31 (B0007) 21:36	04:00 16:03 (B0002) 22:05
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	06:23 (B0007) 04:18 16:30 (B0007) 21:38	04:01 16:04 (B0002) 22:04
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	06:22 (B0007) 04:16 16:29 (B0007) 21:39	04:02 16:05 (B0002) 22:04
29	08:10 16:17	06:59 17:29	05:39 18:32	05:16 20:40	06:21 (B0007) 04:15 16:28 (B0007) 21:41	04:02 16:06 (B0002) 22:04
30	08:08 16:19	06:59 17:31	05:37 18:34	05:14 20:42	06:20 (B0007) 04:13 16:27 (B0007) 21:43	04:03 16:07 (B0002) 22:03
31	08:06 16:21	06:59 17:33	05:34 18:36	05:11 20:44	06:19 (B0007) 04:12 16:26 (B0007) 21:44	04:03 16:08 (B0002) 22:03
Potential sun hours	228	262	366	429	515	539
Total, worst case	100	226	381	378	82	618
Sun reduction	0,19	0,16	0,22	0,42	0,53	0,43
Oper. time red.	0,99	0,99	0,99	0,99	0,99	0,99
Wind dir. red.	0,55	0,59	0,63	0,65	0,68	0,69
Total reduction	0,10	0,09	0,13	0,27	0,35	0,29
Total, real	10	21	51	101	29	177

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:24>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (824)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03 22:02	05:00 (B0002) 05:22 (B0002) 05:01 (B0002)	04:53 21:18 04:55	05:58 20:01 06:01	06:30 (B0007) 18:37 07:04	07:02 16:15 07:13
2	04:05 22:02	05:01 (B0002) 05:22 (B0002)	21:16 04:57	06:03 19:58	06:34 (B0007) 18:34	07:06 16:13
3	04:06 22:02	05:01 (B0002) 05:21 (B0002)	21:14 04:59	06:03 19:55	06:37 (B0007) 18:31	07:06 16:11
4	04:07 22:01	05:01 (B0002) 05:21 (B0002)	21:12 04:59	06:05 19:52	06:44 (B0022) 18:28	07:08 16:09
5	04:08 22:00	05:02 (B0002) 05:20 (B0002)	05:01 21:09	06:07 19:50	06:42 (B0022) 18:26	07:10 16:06
6	04:09 22:00	05:03 (B0002) 05:20 (B0002)	05:03 21:07	06:09 19:47	06:41 (B0022) 18:23	07:13 16:04
7	04:10 21:59	05:04 (B0002) 05:19 (B0002)	05:05 21:05	06:11 19:44	06:41 (B0022) 18:20	07:15 16:02
8	04:11 21:58	05:06 (B0002) 05:19 (B0002)	05:07 21:02	06:13 19:41	06:43 (B0022) 18:17	07:17 16:00
9	04:12 21:57	05:07 (B0002) 05:18 (B0002)	05:09 21:00	06:15 19:38	06:45 (B0022) 18:15	07:19 15:57
10	04:14 21:56	05:09 (B0002) 05:16 (B0002)	05:12 20:58	06:17 19:36	06:47 (B0022) 18:12	07:21 15:55
11	04:15 21:54	05:14 20:55	05:47 (B0006) 19:33	06:20 19:33	07:12 (B0003) 18:09	07:23 15:53
12	04:17 21:53	05:16 20:53	05:49 (B0006) 19:30	06:22 19:30	07:12 (B0003) 18:07	07:26 15:51
13	04:18 21:52	05:18 20:50	05:51 (B0006) 19:27	06:24 19:27	07:11 (B0003) 18:04	07:28 15:49
14	04:20 21:51	05:20 20:48	05:53 (B0006) 19:24	06:26 19:24	07:11 (B0003) 18:01	07:30 15:47
15	04:21 21:49	05:22 20:45	05:56 (B0006) 19:22	06:28 19:22	07:12 (B0003) 17:58	07:32 15:45
16	04:23 21:48	05:24 20:43	06:30 19:19	06:30 19:19	07:12 (B0003) 17:56	07:35 15:43
17	04:25 21:46	05:26 20:40	06:32 19:16	06:32 19:16	07:12 (B0003) 17:53	07:37 15:42
18	04:26 21:45	05:29 20:38	06:34 19:13	06:34 19:13	07:13 (B0003) 17:51	07:39 15:40
19	04:28 21:43	05:31 20:35	06:36 19:10	06:36 19:10	07:12 (B0013) 17:48	07:41 15:38
20	04:30 21:41	05:33 20:33	06:38 19:08	06:38 19:08	07:11 (B0013) 17:45	07:43 15:36
21	04:31 21:40	05:35 20:30	06:41 19:05	06:41 19:05	07:10 (B0013) 17:43	07:46 15:35
22	04:33 21:38	05:37 20:27	06:43 19:02	06:43 19:02	07:12 (B0008) 17:40	07:48 15:33
23	04:35 21:36	05:39 20:25	06:45 18:59	06:45 18:59	07:14 (B0008) 17:38	07:50 15:31
24	04:37 21:34	05:41 20:22	06:47 18:56	06:47 18:56	07:16 (B0008) 17:35	07:52 15:30
25	04:39 21:33	05:44 20:19	06:33 (B0007) 18:53	06:49 18:53	07:18 (B0008) 16:33	06:55 15:29
26	04:41 21:31	05:46 20:17	06:31 (B0007) 18:51	06:51 18:51	07:21 (B0008) 16:30	06:57 15:27
27	04:43 21:29	05:48 20:14	06:30 (B0007) 18:48	06:53 18:48	07:23 (B0008) 16:28	06:59 15:26
28	04:45 21:27	05:50 20:11	06:30 (B0007) 18:45	06:55 18:45	07:02 16:25	07:02 15:24
29	04:47 21:25	05:52 20:09	06:29 (B0007) 18:42	06:58 18:42	07:04 16:23	07:04 15:23
30	04:49 21:23	05:54 20:06	06:29 (B0007) 18:40	07:00 18:40	07:06 16:20	07:06 15:22
31	04:51 21:20	05:56 20:03	06:29 (B0007) 18:40	07:00 18:40	07:08 16:18	07:08 15:22
Potential sun hours	538	474	386	321	241	207
Total, worst case	164	201	570	273	143	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,67	0,64	0,59	0,56	
Total reduction	0,26	0,23	0,19	0,15	0,09	
Total, real	42	46	110	40	13	

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:25>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (862)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	08:43 15:23	08:04 16:24		06:57 17:29	07:55 (B0005) 08:07 (B0005)	06:31 19:38	07:36 (B0004) 07:56 (B0004)	05:11 20:45	05:50 (B0008) 06:08 (B0008)	04:11 21:46	05:04 (B0007) 05:19 (B0007)
2	08:43 15:25	08:02 16:26		06:54 17:32	07:58 (B0005) 08:03 (B0005)	06:28 19:41	06:55 (B0009) 07:53 (B0004)	05:09 20:47	05:38 (B0022) 06:08 (B0008)	04:09 21:47	05:04 (B0007) 05:19 (B0007)
3	08:43 15:26	08:00 16:28		06:51 17:34		06:26 19:43	06:53 (B0009) 07:51 (B0004)	05:06 20:49	05:36 (B0022) 06:08 (B0008)	04:08 21:49	05:04 (B0007) 05:19 (B0007)
4	08:42 15:27	07:58 16:31		06:49 17:36		06:23 19:45	06:51 (B0009) 07:06 (B0009)	05:04 20:51	05:34 (B0022) 06:08 (B0008)	04:07 21:50	05:04 (B0007) 05:05 (B0007)
5	08:42 15:29	07:56 16:33		06:46 17:39		06:20 19:47	06:50 (B0009) 07:06 (B0009)	05:02 20:53	05:32 (B0022) 06:06 (B0008)	04:06 21:51	05:05 (B0007) 05:19 (B0007)
6	08:41 15:30	07:53 16:35		06:43 17:41		06:17 19:49	06:49 (B0009) 07:06 (B0009)	04:59 20:55	05:32 (B0022) 06:05 (B0008)	04:05 21:53	05:06 (B0007) 05:19 (B0007)
7	08:40 15:32	07:51 16:38		06:41 17:43		06:14 19:52	06:49 (B0009) 07:06 (B0009)	04:57 20:58	05:32 (B0022) 06:04 (B0008)	04:04 21:54	05:06 (B0007) 05:19 (B0007)
8	08:40 15:34	07:49 16:40		06:38 17:45		06:12 19:54	06:48 (B0009) 07:06 (B0009)	04:55 21:00	05:32 (B0022) 06:02 (B0008)	04:03 21:55	05:06 (B0007) 05:18 (B0007)
9	08:39 15:35	07:47 16:43		06:35 17:48		06:09 19:56	06:48 (B0009) 07:05 (B0009)	04:52 21:02	05:32 (B0022) 05:44 (B0022)	04:03 21:56	05:07 (B0007) 05:19 (B0007)
10	08:38 15:37	07:44 16:45		06:32 17:50		06:06 19:58	06:49 (B0009) 07:04 (B0009)	04:50 21:04	05:33 (B0022) 05:44 (B0022)	04:02 21:57	05:07 (B0007) 05:18 (B0007)
11	08:37 15:39	07:42 16:47		06:30 17:52	06:56 (B0010) 07:03 (B0010)	06:03 20:00	06:50 (B0009) 07:02 (B0009)	04:48 21:06	05:33 (B0022) 05:43 (B0022)	04:01 21:58	05:08 (B0007) 05:18 (B0007)
12	08:36 15:41	07:40 16:50		06:27 17:54	06:53 (B0010) 07:04 (B0010)	06:01 20:03	06:51 (B0009) 07:00 (B0009)	04:46 21:08	05:35 (B0022) 05:41 (B0022)	04:01 21:59	05:08 (B0007) 05:09 (B0007)
13	08:35 15:42	07:37 16:52		06:24 17:57	06:50 (B0010) 07:04 (B0010)	05:58 20:05		04:44 21:10		04:00 22:00	05:18 (B0007) 05:10 (B0007)
14	08:34 15:44	07:35 16:54		06:21 17:59	06:50 (B0010) 07:05 (B0010)	05:55 20:07		04:41 21:12		04:00 22:01	05:10 (B0007) 05:18 (B0007)
15	08:33 15:46	07:33 16:57		06:19 18:01	06:50 (B0010) 07:05 (B0010)	05:53 20:09		04:39 21:15		03:59 22:01	05:11 (B0007) 05:18 (B0007)
16	08:31 15:48	07:30 16:59		06:16 18:03	06:49 (B0010) 07:04 (B0010)	05:50 20:11		04:37 21:17		03:59 22:02	05:10 (B0007) 05:17 (B0007)
17	08:30 15:50	07:28 17:01	07:57 (B0005) 08:08 (B0005)	06:13 18:05	06:49 (B0010) 07:03 (B0010)	05:47 20:14	06:14 (B0013) 06:21 (B0013)	04:35 21:19	05:08 (B0007) 05:13 (B0007)	03:59 22:03	05:11 (B0007) 05:17 (B0007)
18	08:29 15:52	07:25 17:04	07:56 (B0005) 08:10 (B0005)	06:10 18:08	06:50 (B0010) 07:02 (B0010)	05:45 20:16	06:12 (B0013) 06:23 (B0013)	04:33 21:21	05:06 (B0007) 05:18 (B0007)	03:59 22:03	05:11 (B0007) 05:17 (B0007)
19	08:27 15:54	07:23 17:06	07:54 (B0005) 08:11 (B0005)	06:07 18:10	06:45 (B0004) 06:59 (B0010)	05:42 20:18	06:10 (B0013) 06:23 (B0013)	04:31 21:23	05:05 (B0007) 05:16 (B0007)	03:59 22:04	05:12 (B0007) 05:17 (B0007)
20	08:26 15:57	07:20 17:09	07:53 (B0005) 08:12 (B0005)	06:05 18:12	06:42 (B0004) 06:59 (B0004)	05:39 20:20	06:10 (B0013) 06:24 (B0013)	04:30 21:25	05:05 (B0007) 05:13 (B0007)	03:59 22:04	05:13 (B0007) 05:18 (B0007)
21	08:24 15:59	07:18 17:11	07:53 (B0005) 08:13 (B0005)	06:02 18:14	06:40 (B0004) 07:00 (B0004)	05:37 20:22	06:09 (B0013) 06:23 (B0013)	04:28 21:26	05:06 (B0007) 05:15 (B0007)	03:59 22:04	05:13 (B0007) 05:18 (B0007)
22	08:22 16:01	07:15 17:13	07:52 (B0005) 08:13 (B0005)	05:59 18:16	06:38 (B0004) 07:01 (B0004)	05:34 20:25	06:09 (B0013) 06:23 (B0013)	04:26 21:28	05:05 (B0007) 05:16 (B0007)	03:59 22:04	05:13 (B0007) 05:18 (B0007)
23	08:21 16:03	07:12 17:16	07:51 (B0005) 08:12 (B0005)	05:56 18:19	06:37 (B0004) 07:01 (B0004)	05:31 20:27	06:09 (B0013) 06:22 (B0013)	04:24 21:30	05:04 (B0007) 05:17 (B0007)	03:59 22:05	05:13 (B0007) 05:18 (B0007)
24	08:19 16:05	07:10 17:18	07:52 (B0005) 08:13 (B0005)	05:53 18:21	06:36 (B0004) 07:01 (B0004)	05:29 20:29	06:10 (B0013) 06:21 (B0013)	04:22 21:32	05:04 (B0007) 05:18 (B0007)	04:00 22:05	05:13 (B0007) 05:19 (B0007)
25	08:17 16:08	07:07 17:20	07:52 (B0005) 08:12 (B0005)	05:51 18:23	06:36 (B0004) 07:02 (B0004)	05:26 20:31	05:57 (B0008) 06:19 (B0013)	04:21 21:34	05:03 (B0007) 05:18 (B0007)	04:00 22:05	05:13 (B0007) 05:19 (B0007)
26	08:16 16:10	07:05 17:22	07:52 (B0005) 08:11 (B0005)	05:48 18:25	06:35 (B0004) 07:02 (B0004)	05:24 20:34	05:55 (B0008) 06:06 (B0008)	04:19 21:36	05:03 (B0007) 05:18 (B0007)	04:00 22:04	05:13 (B0007) 05:20 (B0007)
27	08:14 16:12	07:02 17:25	07:52 (B0005) 08:10 (B0005)	05:45 18:27	06:35 (B0004) 07:01 (B0004)	05:21 20:36	05:53 (B0008) 06:08 (B0008)	04:18 21:37	05:03 (B0007) 05:19 (B0007)	04:01 22:04	05:13 (B0007) 05:20 (B0007)
28	08:12 16:14	06:59 17:27	07:54 (B0005) 08:09 (B0005)	05:42 18:30	06:34 (B0004) 07:00 (B0004)	05:19 20:38	05:52 (B0008) 06:08 (B0008)	04:16 21:39	05:03 (B0007) 05:18 (B0007)	04:02 22:04	05:13 (B0007) 05:21 (B0007)
29	08:10 16:17			06:39 19:32	07:34 (B0004) 07:59 (B0004)	05:16 20:40	05:51 (B0008) 06:08 (B0008)	04:15 21:41	05:03 (B0007) 05:19 (B0007)	04:02 22:04	05:12 (B0007) 05:21 (B0007)
30	08:08 16:19			06:37 19:34	07:35 (B0004) 07:59 (B0004)	05:14 20:42	05:51 (B0008) 06:09 (B0008)	04:13 21:42	05:03 (B0007) 05:19 (B0007)	04:03 22:03	05:12 (B0007) 05:22 (B0007)
31	08:06 16:21			06:34 19:36	07:35 (B0004) 07:57 (B0004)			04:12 21:44	05:03 (B0007) 05:19 (B0007)		
Potential sun hours	228	263		366		429		515		539	
Total, worst case		216		419		392		396		276	
Sun reduction		0,16		0,22		0,42		0,53		0,43	
Oper. time red.		0,99		0,99		0,99		0,99		0,99	
Wind dir. red.		0,59		0,62		0,65		0,68		0,69	
Total reduction		0,09		0,13		0,27		0,35		0,29	
Total, real		20		56		106		140		79	

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:25>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (862)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

July		August		September		October		November		December	
1	04:04	05:13 (B0007)	04:53	05:44 (B0022)	05:58	06:49 (B0009)	07:02	07:31 (B0010)	07:11	08:16	
2	22:03	10 05:23 (B0007)	21:18	8 05:52 (B0022)	20:00	12 07:01 (B0009)	18:37	13 07:44 (B0010)	16:15	15:21	
3	04:05	05:13 (B0007)	04:55	05:43 (B0022)	06:01	06:47 (B0009)	07:04	07:33 (B0010)	07:13	08:18	
4	22:02	10 05:23 (B0007)	21:16	10 05:53 (B0022)	19:58	15 07:02 (B0009)	18:34	9 07:42 (B0010)	16:13	15:20	
5	04:06	05:13 (B0007)	04:57	05:43 (B0022)	06:03	06:46 (B0009)	07:06	07:36 (B0010)	07:15	08:20	
6	22:02	11 05:24 (B0007)	21:14	11 05:54 (B0022)	19:55	17 07:03 (B0009)	18:31	4 07:40 (B0010)	16:11	15:19	
7	04:07	05:11 (B0007)	04:59	05:42 (B0022)	06:05	06:45 (B0009)	07:08		07:18	08:21	
8	22:01	13 05:24 (B0007)	21:12	18 06:11 (B0008)	19:52	18 07:03 (B0009)	18:28		16:09	15:18	
9	04:08	05:11 (B0007)	05:01	05:42 (B0022)	06:07	06:45 (B0009)	07:10		07:20	08:23	
10	22:00	13 05:24 (B0007)	21:09	22 06:13 (B0008)	19:49	18 07:03 (B0009)	18:26		16:06	15:17	
11	04:09	05:11 (B0007)	05:03	05:42 (B0022)	06:09	06:45 (B0009)	07:13		07:22	08:25	
12	21:59	14 05:25 (B0007)	21:07	26 06:15 (B0008)	19:47	17 07:02 (B0009)	18:23		16:04	15:16	
13	04:10	05:12 (B0007)	05:05	05:42 (B0022)	06:11	06:45 (B0009)	07:15		07:25	08:26	
14	21:59	14 05:26 (B0007)	21:05	28 06:16 (B0008)	19:44	16 07:01 (B0009)	18:20		16:02	15:16	
15	04:11	05:12 (B0007)	05:07	05:41 (B0022)	06:13	06:45 (B0009)	07:17		07:27	08:28	
16	21:58	14 05:26 (B0007)	21:02	29 06:16 (B0008)	19:41	15 07:00 (B0009)	18:17		16:00	15:15	
17	04:13	05:12 (B0007)	05:09	05:43 (B0022)	06:15	06:46 (B0009)	07:19		07:29	08:29	
18	21:57	15 05:27 (B0007)	21:00	27 06:16 (B0008)	19:38	23 07:44 (B0004)	18:15		15:57	15:15	
19	04:14	05:11 (B0007)	05:12	05:45 (B0022)	06:17	06:48 (B0009)	07:21		07:31	08:30	
20	21:56	16 05:27 (B0007)	20:58	25 06:17 (B0008)	19:36	23 07:46 (B0004)	18:12		15:55	15:14	
21	04:15	05:11 (B0007)	05:14	05:47 (B0022)	06:20	07:29 (B0004)	07:23		07:34	08:32	
22	21:54	16 05:27 (B0007)	20:55	22 06:17 (B0008)	19:33	19 07:48 (B0004)	18:09		15:53	15:14	
23	04:17	05:12 (B0007)	05:16	05:58 (B0008)	06:22	07:27 (B0004)	07:26	08:30 (B0005)	07:36	08:33	
24	21:53	16 05:28 (B0007)	20:53	19 06:17 (B0008)	19:30	22 07:49 (B0004)	18:07	9 08:39 (B0005)	15:51	15:13	
25	04:18	05:12 (B0007)	05:18	05:59 (B0008)	06:24	07:26 (B0004)	07:28	08:27 (B0005)	07:38	08:34	
26	21:52	16 05:28 (B0007)	20:50	17 06:16 (B0008)	19:27	23 07:49 (B0004)	18:04	14 08:41 (B0005)	15:49	15:13	
27	04:20	05:11 (B0007)	05:20	05:59 (B0008)	06:26	07:25 (B0004)	07:30	08:26 (B0005)	07:41	08:35	
28	21:51	16 05:27 (B0007)	20:48	17 06:16 (B0008)	19:24	25 07:50 (B0004)	18:01	17 08:43 (B0005)	15:47	15:13	
29	04:21	05:12 (B0007)	05:22	05:59 (B0008)	06:28	07:25 (B0004)	07:32	08:25 (B0005)	07:43	08:36	
30	21:49	16 05:28 (B0007)	20:45	16 06:15 (B0008)	19:22	26 07:51 (B0004)	17:58	18 08:43 (B0005)	15:45	15:13	
31	04:23	05:12 (B0007)	05:24	06:00 (B0008)	06:30	07:24 (B0004)	07:34	08:23 (B0005)	07:45	08:37	
32	21:48	16 05:28 (B0007)	20:43	14 06:14 (B0008)	19:19	26 07:50 (B0004)	17:56	21 08:44 (B0005)	15:43	15:13	
33	04:25	05:13 (B0007)	05:26	06:02 (B0008)	06:32	07:24 (B0004)	07:37	08:24 (B0005)	07:47	08:38	
34	21:46	15 05:28 (B0007)	20:40	13 06:23 (B0013)	19:16	26 07:50 (B0004)	17:53	20 08:44 (B0005)	15:42	15:13	
35	04:26	05:13 (B0007)	05:29	06:04 (B0008)	06:34	07:23 (B0004)	07:39	08:23 (B0005)	07:49	08:39	
36	21:45	15 05:28 (B0007)	20:38	15 06:26 (B0013)	19:13	27 07:50 (B0004)	17:51	21 08:44 (B0005)	15:40	15:13	
37	04:28	05:14 (B0007)	05:31	06:15 (B0013)	06:36	07:23 (B0004)	07:41	08:22 (B0005)	07:52	08:40	
38	21:43	14 05:28 (B0007)	20:35	12 06:27 (B0013)	19:10	26 07:49 (B0004)	17:48	22 08:44 (B0005)	15:38	15:13	
39	04:30	05:14 (B0007)	05:33	06:15 (B0013)	06:38	07:23 (B0004)	07:43	08:23 (B0005)	07:54	08:41	
40	21:41	13 05:27 (B0007)	20:33	12 06:27 (B0013)	19:08	25 07:48 (B0004)	17:45	21 08:44 (B0005)	15:36	15:13	
41	04:32	05:15 (B0007)	05:35	06:14 (B0013)	06:41	07:24 (B0004)	07:46	08:23 (B0005)	07:56	08:41	
42	21:40	12 05:27 (B0007)	20:30	14 06:28 (B0013)	19:05	23 07:47 (B0004)	17:43	20 08:43 (B0005)	15:35	15:14	
43	04:33	05:16 (B0007)	05:37	06:14 (B0013)	06:43	07:25 (B0004)	07:48	08:24 (B0005)	07:58	08:42	
44	21:38	10 05:26 (B0007)	20:27	14 06:28 (B0013)	19:02	20 07:45 (B0004)	17:40	18 08:42 (B0005)	15:33	15:14	
45	04:35	05:17 (B0007)	05:39	06:14 (B0013)	06:45	07:26 (B0004)	07:50	08:25 (B0005)	08:00	08:42	
46	21:36	7 05:24 (B0007)	20:25	13 06:27 (B0013)	18:59	17 07:43 (B0004)	17:38	16 08:41 (B0005)	15:32	15:15	
47	04:37	05:20 (B0007)	05:41	06:14 (B0013)	06:47	07:27 (B0004)	07:52	08:26 (B0005)	08:02	08:43	
48	21:34	2 05:22 (B0007)	20:22	12 06:26 (B0013)	18:56	15 07:42 (B0010)	17:35	13 08:39 (B0005)	15:30	15:15	
49	04:39		05:44	06:15 (B0013)	06:49	07:31 (B0004)	06:55	07:28 (B0005)	08:04	08:43	
50	21:32		20:19	10 06:25 (B0013)	18:53	13 07:44 (B0010)	16:33	9 07:37 (B0005)	15:29	15:16	
51	04:41		05:46	06:17 (B0013)	06:51	07:33 (B0010)	06:57		08:06	08:43	
52	21:31		20:17	7 06:24 (B0013)	18:51	13 07:46 (B0010)	16:30		15:27	15:17	
53	04:43		05:48		06:53	07:31 (B0010)	06:59		08:08	08:44	
54	21:29		20:14		18:48	15 07:46 (B0010)	16:28		15:26	15:18	
55	04:45		05:50		06:55	07:31 (B0010)	07:02		08:10	08:44	
56	21:27		20:11		18:45	15 07:46 (B0010)	16:25		15:24	15:19	
57	04:47		05:52		06:58	07:30 (B0010)	07:04		08:12	08:44	
58	21:25		20:09		18:42	15 07:45 (B0010)	16:23		15:23	15:20	
59	04:49		05:54		07:00	07:30 (B0010)	07:06		08:14	08:44	
60	21:23		20:06		18:39	15 07:45 (B0010)	16:20		15:22	15:21	
61	04:51		05:56		06:51 (B0009)		07:08		08:14	08:44	
62	21:20	2 05:49 (B0022)	20:03	9 07:00 (B0009)			16:18		15:22	15:22	
63	Potential sun hours	538	474		386		321		241	207	
64	Total, worst case	316	440		580		265				
65	Sun reduction	0,38	0,35		0,31		0,26				
66	Oper. time red.	0,99	0,99		0,99		0,99				
67	Wind dir. red.	0,69	0,67		0,63		0,60				
68	Total reduction	0,26	0,23		0,19		0,15				
69	Total, real	82	102		111		40				

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:26>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (981)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January		February		March		April		May		June	
1	08:43		08:04	08:36 (B0005)	06:57	07:34 (B0010)	06:31	06:58 (B0008)	05:11	06:06 (B0007)	04:11	
	15:23		16:24	6 08:42 (B0005)	17:29	23 08:01 (B0004)	19:38	16 07:14 (B0008)	20:45	5 06:41 (B0003)	21:46	
2	08:43		08:02	08:34 (B0005)	06:54	07:46 (B0004)	06:28	06:58 (B0008)	05:09		04:09	
	15:25		16:26	9 08:43 (B0005)	17:32	13 07:59 (B0004)	19:41	16 07:14 (B0008)	20:47		21:47	
3	08:43		08:00	08:32 (B0005)	06:51	07:48 (B0004)	06:26	06:58 (B0008)	05:06		04:08	
	15:26		16:28	12 08:44 (B0005)	17:34	8 07:56 (B0004)	19:43	16 07:14 (B0008)	20:49		21:49	
4	08:42		07:58	08:29 (B0005)	06:49		06:23	06:58 (B0008)	05:04		04:07	
	15:27		16:31	15 08:44 (B0005)	17:36		19:45	15 07:13 (B0008)	20:51		21:50	
5	08:42		07:56	08:28 (B0005)	06:46		06:20	06:58 (B0008)	05:02		04:06	
	15:29		16:33	17 08:45 (B0005)	17:39		19:47	14 07:12 (B0008)	20:53		21:51	
6	08:41		07:53	08:29 (B0005)	06:43		06:17	06:58 (B0008)	04:59		04:05	
	15:30		16:35	16 08:45 (B0005)	17:41		19:49	12 07:10 (B0008)	20:55		21:53	
7	08:40		07:51	08:29 (B0005)	06:41		06:14	07:00 (B0008)	04:57		04:04	
	15:32		16:38	15 08:44 (B0005)	17:43		19:52	9 07:09 (B0008)	20:58		21:54	
8	08:40		07:49	08:30 (B0005)	06:38		06:12		04:55	05:25 (B0006)	04:03	
	15:34		16:40	14 08:44 (B0005)	17:45		19:54		21:00	1 05:26 (B0006)	21:55	
9	08:39		07:47	08:30 (B0005)	06:35		06:09		04:52	05:23 (B0006)	04:03	
	15:35		16:43	12 08:42 (B0005)	17:48		19:56		21:02	5 05:28 (B0006)	21:56	
10	08:38		07:44	08:33 (B0005)	06:32		06:06	06:33 (B0022)	04:50	05:21 (B0006)	04:02	
	15:37		16:45	8 08:41 (B0005)	17:50		19:58	1 06:34 (B0022)	21:04	7 05:28 (B0006)	21:57	
11	08:37		07:42		06:30	06:56 (B0009)	06:03	06:30 (B0022)	04:48	05:19 (B0006)	04:01	
	15:39		16:47		17:52	5 07:01 (B0009)	20:00	14 06:51 (B0003)	21:06	10 05:29 (B0006)	21:58	
12	08:36		07:40		06:27	06:53 (B0009)	06:01	06:27 (B0022)	04:46	05:17 (B0006)	04:01	
	15:41		16:50		17:54	9 07:02 (B0009)	20:03	23 06:53 (B0003)	21:08	12 05:29 (B0006)	21:59	
13	08:35		07:37		06:24	06:50 (B0009)	05:58	06:25 (B0022)	04:44	05:15 (B0006)	04:00	
	15:42		16:52		17:57	12 07:02 (B0009)	20:05	30 06:56 (B0003)	21:10	14 05:29 (B0006)	22:00	
14	08:34		07:35		06:21	06:48 (B0009)	05:55	06:23 (B0022)	04:41	05:15 (B0006)	04:00	
	15:44		16:54		17:59	15 07:03 (B0009)	20:07	33 06:56 (B0003)	21:13	13 05:28 (B0006)	22:01	
15	08:33		07:33		06:19	06:47 (B0009)	05:53	06:23 (B0022)	04:39	05:15 (B0006)	03:59	
	15:46		16:57		18:01	16 07:03 (B0009)	20:09	34 06:57 (B0003)	21:15	13 05:28 (B0006)	22:01	
16	08:31		07:30		06:16	06:47 (B0009)	05:50	06:23 (B0022)	04:37	05:16 (B0006)	03:59	
	15:48		16:59		18:03	15 07:02 (B0009)	20:11	35 06:58 (B0003)	21:17	12 05:28 (B0006)	22:02	
17	08:30		07:28		06:13	06:47 (B0009)	05:47	06:24 (B0022)	04:35	05:17 (B0006)	03:59	
	15:50		17:01		18:05	14 07:01 (B0009)	20:14	34 06:58 (B0003)	21:19	10 05:27 (B0006)	22:03	
18	08:29		07:25		06:10	06:48 (B0009)	05:45	06:27 (B0022)	04:33	05:17 (B0006)	03:59	
	15:52		17:04		18:08	11 06:59 (B0009)	20:16	31 06:58 (B0003)	21:21	9 05:26 (B0006)	22:03	
19	08:27		07:23	07:51 (B0004)	06:07	06:50 (B0009)	05:42	06:30 (B0003)	04:31	05:19 (B0006)	03:59	
	15:54		17:06	8 07:59 (B0004)	18:10	6 06:56 (B0009)	20:18	28 06:58 (B0003)	21:23	5 05:24 (B0006)	22:04	
20	08:26		07:20	07:49 (B0004)	06:05		05:39	06:09 (B0007)	04:30		03:59	
	15:57		17:09	13 08:02 (B0004)	18:12		20:20	32 06:58 (B0003)	21:25		22:04	
21	08:24		07:18	07:47 (B0004)	06:02		05:37	06:06 (B0007)	04:28		03:59	
	15:59		17:11	16 08:03 (B0004)	18:14		20:22	38 06:58 (B0003)	21:27		22:04	
22	08:23		07:15	07:45 (B0004)	05:59		05:34	06:05 (B0007)	04:26		03:59	
	16:01		17:13	18 08:03 (B0004)	18:16		20:25	41 06:58 (B0003)	21:28		22:04	
23	08:21		07:12	07:40 (B0010)	05:56		05:31	06:03 (B0007)	04:24		03:59	
	16:03		17:16	22 08:03 (B0004)	18:19		20:27	42 06:57 (B0003)	21:30		22:05	
24	08:19		07:10	07:38 (B0010)	05:53		05:29	06:03 (B0007)	04:22		04:00	
	16:05		17:18	26 08:04 (B0004)	18:21		20:29	42 06:56 (B0003)	21:32		22:05	
25	08:17		07:07	07:35 (B0010)	05:51		05:26	06:02 (B0007)	04:21		04:00	
	16:08		17:20	29 08:04 (B0004)	18:23		20:31	41 06:55 (B0003)	21:34		22:05	
26	08:16		07:05	07:32 (B0010)	05:48		05:24	06:02 (B0007)	04:19		04:00	
	16:10		17:22	31 08:03 (B0004)	18:25		20:34	39 06:54 (B0003)	21:36		22:05	
27	08:14		07:02	07:32 (B0010)	05:45		05:21	06:02 (B0007)	04:18		04:01	
	16:12		17:25	32 08:04 (B0004)	18:27		20:36	37 06:53 (B0003)	21:38		22:04	
28	08:12		06:59	07:32 (B0010)	05:42	06:08 (B0013)	05:19	06:02 (B0007)	04:16		04:02	
	16:14		17:27	29 08:03 (B0004)	18:30	5 06:13 (B0013)	20:38	33 06:51 (B0003)	21:39		22:04	
29	08:10				06:39	07:05 (B0008)	05:16	06:03 (B0007)	04:15		04:02	
	16:17				19:32	8 07:13 (B0013)	20:40	28 06:49 (B0003)	21:41		22:04	
30	08:08				06:37	07:03 (B0008)	05:14	06:05 (B0007)	04:13		04:03	
	16:19				19:34	11 07:14 (B0008)	20:42	20 06:47 (B0003)	21:43		22:03	
31	08:06	08:39 (B0005)			06:34	07:00 (B0008)			04:12			
	16:21	3 08:42 (B0005)			19:36	14 07:14 (B0008)			21:44			
Potential sun hours	228		262		366		429		515		539	
Total, worst case	3		348		185		754		116			
Sun reduction	0,19		0,16		0,22		0,42		0,53			
Oper. time red.	0,99		0,99		0,99		0,99		0,99			
Wind dir. red.	0,57		0,59		0,62		0,66		0,69			
Total reduction	0,10		0,09		0,13		0,27		0,36			
Total, real	0		32		25		205		41			

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: KONGSERYD 1:26>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (981)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:04 22:03	04:53 21:18	05:28 (B0006) 05:39 (B0006)	05:58 20:01	06:29 (B0022) 06:50 (B0003)	07:02 18:37
2	04:05 22:02	04:55 21:16	05:30 (B0006) 05:39 (B0006)	06:01 19:58	06:31 (B0022) 06:32 (B0022)	07:04 18:34
3	04:06 22:02	04:57 21:14	05:32 (B0006) 05:38 (B0006)	06:03 19:55	07:06 18:31	07:31 (B0009) 07:38 (B0009)
4	04:07 22:01	04:59 21:12	05:34 (B0006) 05:37 (B0006)	06:05 19:52	07:08 18:28	07:11 16:09
5	04:08 22:00	05:01 21:09	06:07 19:50	06:57 (B0008) 07:05 (B0008)	07:10 18:26	07:20 16:06
6	04:09 22:00	05:03 21:07	06:09 19:47	06:54 (B0008) 07:06 (B0008)	07:13 18:23	07:22 16:04
7	04:10 21:59	05:05 21:05	06:11 19:44	06:53 (B0008) 07:07 (B0008)	07:15 18:20	07:25 16:02
8	04:11 21:58	05:07 21:02	06:13 19:41	06:52 (B0008) 07:07 (B0008)	07:17 18:17	07:27 16:00
9	04:13 21:57	05:09 21:00	06:15 19:38	06:51 (B0008) 07:07 (B0008)	07:19 18:15	07:29 15:57
10	04:14 21:56	05:12 20:58	06:17 19:36	06:51 (B0008) 07:07 (B0008)	07:21 18:12	08:25 (B0004) 08:28 (B0004)
11	04:15 21:54	05:14 20:55	06:20 19:33	06:51 (B0008) 07:06 (B0008)	07:23 18:09	08:22 (B0004) 08:32 (B0004)
12	04:17 21:53	05:16 20:53	06:22 19:30	06:51 (B0008) 07:06 (B0008)	07:26 18:07	08:09 (B0010) 08:34 (B0004)
13	04:18 21:52	05:18 20:50	06:24 19:27	06:53 (B0008) 07:05 (B0013)	07:28 18:04	08:06 (B0010) 08:35 (B0004)
14	04:20 21:51	05:20 20:48	06:26 19:24	06:55 (B0008) 07:04 (B0013)	07:30 18:01	08:05 (B0010) 08:36 (B0004)
15	04:21 21:49	05:22 20:45	06:28 19:22	06:58 (B0013) 07:04 (B0013)	07:32 17:58	08:04 (B0010) 08:36 (B0004)
16	04:23 21:48	05:24 20:43	06:30 19:19	07:00 (B0013) 07:01 (B0013)	07:35 17:56	08:05 (B0010) 08:36 (B0004)
17	04:25 21:46	05:26 20:40	06:32 19:16	07:01 (B0013) 07:01 (B0003)	07:37 17:53	08:08 (B0010) 08:36 (B0004)
18	04:26 21:45	05:29 20:38	06:34 19:13	07:02 (B0003) 07:02 (B0003)	07:39 17:51	08:10 (B0010) 08:35 (B0004)
19	04:28 21:43	05:31 20:35	06:36 19:10	07:02 (B0003) 07:02 (B0003)	07:41 17:48	08:12 (B0010) 08:34 (B0004)
20	04:30 21:41	05:33 20:33	06:38 19:08	07:02 (B0003) 07:02 (B0003)	07:43 17:45	08:17 (B0004) 08:34 (B0004)
21	04:32 21:40	05:35 20:30	06:41 19:05	07:09 (B0007) 07:02 (B0003)	07:46 17:43	08:17 (B0004) 08:32 (B0004)
22	04:33 21:38	05:37 20:27	06:43 19:02	07:11 (B0007) 07:02 (B0003)	07:48 17:40	08:20 (B0004) 08:31 (B0004)
23	04:35 21:36	05:39 20:25	06:45 18:59	07:14 (B0007) 07:02 (B0003)	07:50 17:38	08:22 (B0004) 08:28 (B0004)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:35 (B0009) 07:02 (B0003)	07:52 17:35	08:02 15:30
25	04:39 21:33	05:44 20:19	06:49 18:53	07:31 (B0009) 07:01 (B0003)	06:55 16:33	08:04 15:29
26	04:41 21:31	05:46 20:17	06:51 18:51	07:31 (B0009) 07:00 (B0003)	06:57 16:30	08:06 15:27
27	04:43 21:29	05:48 20:14	06:53 18:48	07:29 (B0009) 07:43 (B0009)	06:59 16:28	08:08 15:26
28	04:45 21:27	05:50 20:11	06:55 18:45	07:28 (B0009) 07:43 (B0009)	07:02 16:25	08:10 15:24
29	04:47 21:25	05:52 20:09	06:58 18:42	07:28 (B0009) 07:43 (B0009)	07:04 16:23	08:12 15:23
30	04:49 21:23	05:54 20:06	06:58 18:40	07:29 (B0009) 07:42 (B0009)	07:06 16:20	08:14 15:22
31	04:51 21:20	05:56 20:03	06:58 18:37	07:29 (B0009) 07:42 (B0009)	07:06 16:20	08:14 15:22
Potential sun hours	538	474	386	321	241	207
Total, worst case	83	685	236	294	129	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,66	0,64	0,60	0,57	
Total reduction	0,26	0,23	0,19	0,15	0,10	
Total, real	21	156	46	44	12	

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LILLA HESTER 2:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (856)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	06:58 (5) 07:08 (5)	05:11 20:44
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	06:59 (5) 07:05 (5)	05:08 20:47
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:49
4	08:42 15:27	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:50
5	08:42 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:53
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:54
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	05:19 (1) 05:22 (1)
12	08:36 15:40	07:40 16:49	06:27 17:54	06:00 20:02	04:45 21:08	05:17 (1) 05:22 (1)
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	05:15 (1) 05:22 (1)
14	08:34 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	05:13 (1) 05:21 (1)
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	05:11 (1) 05:21 (1)
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	05:09 (1) 05:20 (1)
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	05:07 (1) 05:19 (1)
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:16	04:33 21:21	05:07 (1) 05:19 (1)
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:22	05:08 (1) 05:18 (1)
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	05:09 (1) 05:16 (1)
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	04:59 (1) 05:14 (1)
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	04:57 (1) 05:12 (1)
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	04:58 (2) 05:00 (2)
24	08:19 16:05	07:10 17:17	05:53 18:21	05:28 20:29	04:22 21:32	04:56 (2) 04:59 (2)
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	04:55 (2) 04:59 (2)
26	08:16 16:09	07:04 17:22	05:48 18:25	05:23 20:33	04:19 21:36	04:54 (2) 04:59 (2)
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:36	04:17 21:37	04:52 (2) 04:58 (2)
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:51 (2) 04:58 (2)
29	08:10 16:16	06:39 19:32	06:39 19:32	07:05 (5) 07:11 (5)	05:16 20:40	04:50 (2) 04:57 (2)
30	08:08 16:19	06:36 19:34	06:36 19:34	07:02 (5) 07:10 (5)	05:13 20:42	04:50 (2) 04:57 (2)
31	08:06 16:21	06:34 19:36	06:34 19:36	07:00 (5) 07:10 (5)	04:11 21:44	04:52 (2) 04:55 (2)
Potential sun hours	228	262	366	429	515	539
Total, worst case			38	87		130
Sun reduction			0,22	0,42		0,53
Oper. time red.			0,99	0,99		0,99
Wind dir. red.			0,65	0,67		0,69
Total reduction			0,14	0,28		0,36
Total, real			5	24		47

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LILLA HESTER 2:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (856)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03	04:52	05:28 (1)	05:58	07:02	07:11
	22:03	21:18	4 05:32 (1)	20:00	18:36	16:15
2	04:04	04:54	05:30 (1)	06:00	07:04	07:13
	22:02	21:16	2 05:32 (1)	19:58	18:34	16:13
3	04:05	04:56		06:02	07:06	07:15
	22:02	21:14		19:55	18:31	16:10
4	04:06	04:59		06:04	07:08	07:17
	22:01	21:12		19:52	18:28	16:08
5	04:07	05:01		06:07	07:10	07:20
	22:00	21:09		19:49	18:25	16:06
6	04:08	05:03		06:09	07:12	07:22
	21:59	21:07		19:46	18:23	16:04
7	04:09	05:05		06:11	07:14	07:24
	21:59	21:05		19:44	18:20	16:01
8	04:11	05:07		06:13	07:17	07:27
	21:58	21:02		19:41	18:17	15:59
9	04:12	05:09		06:15	07:19	07:29
	21:57	21:00		19:38	18:14	15:57
10	04:13	05:11		06:17	07:21	07:31
	21:55	20:58		19:35	5 06:58 (5)	18:12
11	04:15	05:13		06:19	06:50 (5)	07:23
	21:54	20:55		19:33	10 07:00 (5)	18:09
12	04:16	05:15		06:21	06:51 (5)	07:25
	21:53	20:53		19:30	10 07:01 (5)	18:06
13	04:18	05:18		06:23	06:53 (5)	07:28
	21:52	4 05:03 (2)	20:50	9 06:05 (4)	19:27	8 07:01 (5)
14	04:19	05:20		05:53 (3)	06:26	06:55 (5)
	21:51	8 05:06 (2)	20:48	12 06:07 (4)	19:24	6 07:01 (5)
15	04:21	05:22		05:55 (3)	06:28	06:57 (5)
	21:49	7 05:06 (2)	20:45	13 06:08 (4)	19:21	4 07:01 (5)
16	04:22	05:24		05:57 (4)	06:30	06:59 (5)
	21:48	7 05:08 (2)	20:43	12 06:09 (4)	19:18	1 07:00 (5)
17	04:24	05:26		05:59 (4)	06:32	
	21:46	6 05:08 (2)	20:40	10 06:09 (4)	19:16	
18	04:26	05:28		06:01 (4)	06:34	
	21:45	5 05:09 (2)	20:38	8 06:09 (4)	19:13	
19	04:27	05:30		06:03 (4)	06:36	
	21:43	4 05:09 (2)	20:35	6 06:09 (4)	19:10	
20	04:29	05:32		06:05 (4)	06:38	
	21:41	2 05:09 (2)	20:32	3 06:08 (4)	19:07	
21	04:31	05:35			06:40	
	21:40	1 05:09 (2)	20:30		19:04	
22	04:33	05:37			06:42	
	21:38		20:27		19:02	4 07:12 (6)
23	04:35	05:39			06:44	
	21:36	3 05:25 (1)	20:25		18:59	4 07:18 (6)
24	04:37	05:41			06:47	
	21:34	8 05:27 (1)	20:22		18:56	2 07:18 (6)
25	04:38	05:43			06:49	
	21:32	10 05:28 (1)	20:19		18:53	
26	04:40	05:45			06:51	
	21:30	13 05:30 (1)	20:17		18:50	
27	04:42	05:47			06:53	
	21:29	12 05:31 (1)	20:14		18:48	
28	04:44	05:50			06:55	
	21:27	11 05:31 (1)	20:11		18:45	
29	04:46	05:52			06:57	
	21:24	9 05:31 (1)	20:08		18:42	
30	04:48	05:54			06:59	
	21:22	8 05:32 (1)	20:06		18:39	
31	04:50	05:56				
	21:20	6 05:32 (1)	20:03			
Potential sun hours	538	474	386	321	241	207
Total, worst case	124	79	54			
Sun reduction	0,38	0,35	0,31			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,67	0,65			
Total reduction	0,26	0,24	0,20			
Total, real	32	19	11			

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LILLA HESTER 2:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (832)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	06:57 (5) 07:11 (5)	05:11 20:44
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	06:58 (5) 07:09 (5)	05:08 20:47
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	06:59 (5) 07:06 (5)	05:06 20:49
4	08:42 15:27	07:58 16:30	06:48 17:36	06:22 19:45	05:04 20:51	05:04 21:50
5	08:42 15:28	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:05 21:51
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:04 21:53
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	04:56 20:57	04:04 21:54
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	04:54 21:00	04:03 21:55
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	04:52 21:02	04:02 21:56
10	08:38 15:36	07:44 16:44	06:32 17:49	06:06 19:58	04:50 21:04	04:01 21:57
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:47 21:06	04:01 21:58
12	08:36 15:40	07:40 16:49	06:27 17:54	06:00 20:02	04:45 21:08	04:00 21:59
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	04:00 22:00
14	08:34 15:44	07:35 16:54	06:21 17:58	05:55 20:07	04:41 21:12	03:59 22:01
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	05:09 (1) 05:10 (1)
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	05:07 (1) 05:11 (1)
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:16	04:33 21:20	05:06 (1) 05:11 (1)
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:22	05:04 (1) 05:11 (1)
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	05:02 (1) 05:11 (1)
21	08:24 15:58	07:17 17:10	06:01 18:14	05:36 20:22	04:27 21:26	05:01 (1) 05:12 (1)
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:24	04:25 21:28	04:59 (1) 05:11 (1)
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	04:58 (1) 05:11 (1)
24	08:19 16:05	07:10 17:17	05:53 18:21	05:28 20:29	04:22 21:32	04:56 (1) 05:11 (1)
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:20 21:34	05:11 (1) 05:11 (1)
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:36	04:55 (1) 05:11 (1)
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:36	04:17 21:37	04:55 (1) 05:09 (1)
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	04:16 21:39	04:56 (1) 05:09 (1)
29	08:10 16:16	06:39 19:32	05:16 19:32	05:16 20:40	04:14 21:41	04:57 (1) 05:09 (1)
30	08:08 16:19	06:36 19:34	05:13 19:34	05:13 20:42	04:13 21:42	04:49 (2) 05:08 (1)
31	08:06 16:21	06:34 19:36	05:11 19:36	05:11 20:42	04:11 21:44	04:48 (2) 05:07 (1)
Potential sun hours	228	262	366	429	515	539
Total, worst case			57	83	229	222
Sun reduction			0,22	0,42	0,53	0,43
Oper. time red.			0,99	0,99	0,99	0,99
Wind dir. red.			0,64	0,67	0,69	0,69
Total reduction			0,14	0,28	0,36	0,29
Total, real			8	23	83	64

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LILLA HESTER 2:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (832)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	9 04:44 (2) 04:52 04:53 (2) 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:20
2	04:04 22:02	10 04:44 (2) 04:54 04:54 (2) 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:19
3	04:05 22:02	10 04:45 (2) 04:56 04:55 (2) 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:18
4	04:06 22:01	9 04:46 (2) 04:59 04:55 (2) 21:12	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:17
5	04:07 22:00	9 04:47 (2) 05:01 04:56 (2) 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	8 04:48 (2) 05:03 04:56 (2) 21:07	06:09 19:46	07:12 18:23	07:22 16:04	08:24 15:16
7	04:09 21:59	8 04:49 (2) 05:05 04:57 (2) 21:05	06:11 19:44	07:14 18:20	07:24 16:01	08:26 15:15
8	04:11 21:58	7 04:50 (2) 05:07 04:57 (2) 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	04:12 21:57	6 04:51 (2) 05:09 04:57 (2) 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	04:13 21:55	5 04:52 (2) 05:11 04:58 (2) 20:58	13 06:01 (4) 19:38 05:45 (3) 06:17	6 07:00 (5) 18:14 06:51 (5) 07:21	15:57 07:31	15:14 08:30
11	04:15 21:54	4 04:54 (2) 05:13 04:58 (2) 20:55	17 06:03 (4) 19:35 05:47 (3) 06:19	11 07:02 (5) 18:12 06:49 (5) 07:23	15:55 07:34	15:13 08:32
12	04:16 21:53	9 04:55 (2) 05:15 05:14 (1) 20:53	17 06:04 (4) 19:33 05:49 (3) 06:21	14 07:03 (5) 18:09 06:51 (5) 07:25	15:53 07:36	15:13 08:33
13	04:18 21:52	11 04:56 (2) 05:17 05:15 (1) 20:50	15 06:04 (4) 19:30 05:51 (4) 06:23	12 07:03 (5) 18:06 06:53 (5) 07:28	15:51 07:38	15:13 08:34
14	04:19 21:51	12 04:58 (2) 05:20 05:17 (1) 20:48	14 06:05 (4) 19:27 05:53 (4) 06:25	11 07:04 (5) 18:03 06:55 (5) 07:30	15:49 07:40	15:12 08:35
15	04:21 21:49	12 05:05 (1) 05:22 05:17 (1) 20:45	12 06:05 (4) 19:24 05:55 (4) 06:28	8 07:03 (5) 18:01 06:57 (5) 07:32	15:47 07:43	15:12 08:36
16	04:22 21:48	14 05:05 (1) 05:24 05:19 (1) 20:43	10 06:05 (4) 19:21 05:57 (4) 06:30	6 07:03 (5) 17:58 06:59 (5) 07:34	15:45 07:45	15:12 08:37
17	04:24 21:46	15 05:04 (1) 05:26 05:19 (1) 20:40	7 06:04 (4) 19:18 05:59 (4) 06:32	3 07:02 (5) 17:55 07:36	15:43 07:47	15:12 08:38
18	04:26 21:45	16 05:04 (1) 05:28 05:20 (1) 20:38	5 06:04 (4) 19:16 06:01 (4) 06:34	17:53 07:39	15:41 07:49	15:12 08:39
19	04:27 21:43	2 06:03 (4) 19:13 05:05 (1) 05:30	19:13 06:36	17:50 07:41	15:39 07:51	15:12 08:40
20	04:29 21:41	15 05:20 (1) 20:35 05:07 (1) 05:32	19:10 06:38	17:48 07:43	15:38 07:54	15:13 08:41
21	04:31 21:40	14 05:21 (1) 20:32 05:08 (1) 05:35	19:07 06:40	17:45 07:45	15:36 07:56	15:13 08:41
22	04:33 21:38	13 05:21 (1) 20:30 05:10 (1) 05:37	19:04 06:42	17:42 07:48	15:34 07:58	15:13 08:42
23	04:35 21:36	11 05:21 (1) 20:27 05:12 (1) 05:39	19:02 06:44	3 07:15 (6) 07:48 07:18 (6) 07:50	15:33 08:00	15:14 08:42
24	04:37 21:34	10 05:22 (1) 20:25 05:13 (1) 05:41	18:59 06:47	7 07:21 (6) 07:37 07:16 (6) 07:52	15:31 08:02	15:14 08:43
25	04:38 21:32	8 05:21 (1) 20:22 05:15 (1) 05:43	18:56 06:49	5 07:21 (6) 07:35 07:18 (6) 06:55	15:29 08:04	15:15 08:43
26	04:40 21:30	7 05:22 (1) 20:19 05:17 (1) 05:45	18:53 06:51	4 07:22 (6) 06:32 07:20 (6) 06:57	15:28 08:06	15:15 08:43
27	04:42 21:29	5 05:22 (1) 20:17 05:19 (1) 05:47	18:50 06:53	1 07:21 (6) 06:30 06:59	15:27 08:08	15:16 08:44
28	04:44 21:27	3 05:22 (1) 20:14 05:50 20:11	18:48 06:55	16:27 07:01	15:25 08:10	15:17 08:44
29	04:46 21:24	05:52 20:08	18:45 06:57	16:25 07:04	15:24 08:12	15:18 08:44
30	04:48 21:22	05:54 20:06	18:42 06:59	16:22 07:06	15:23 08:14	15:19 08:44
31	04:50 21:20	05:56 20:03	18:39	16:20 07:08	15:22 15:21	15:20 08:44
Potential sun hours	538	474	386	321	241	207
Total, worst case	260	112	91			
Sun reduction	0,38	0,35	0,31			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,68	0,65			
Total reduction	0,26	0,24	0,20			
Total, real	68	27	18			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:20>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (906)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:09 20:46	04:09 21:47	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:00	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:19 16:06	08:22 15:17
6	08:40 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:46	07:12 18:23	07:22 16:04	08:24 15:16
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:02	08:26 15:16
8	08:39 15:33	07:48 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:54	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:01	04:02 21:55	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:28 15:14
10	08:37 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:36 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:46 21:08	04:00 21:58	04:17 21:53	05:16 20:52	06:21 19:30	07:25 18:06	07:35 15:51	08:32 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:07	04:41 21:12	04:00 22:00	04:20 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	03:59 22:01	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:44 15:43	08:37 15:13
17	08:29 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:13
18	08:28 15:52	07:25 17:04	06:10 18:07	05:44 20:15	04:33 21:20	03:59 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:40	08:39 15:13
19	08:27 15:54	07:22 17:06	06:07 18:09	05:42 20:18	04:31 21:22	03:59 22:03	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:39 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:59 22:03	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:11	06:01 18:14	05:36 20:22	04:28 21:26	03:59 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:55 15:34	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:37	05:37 20:27	06:42 19:02	07:47 17:40	07:58 15:33	08:41 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:15
24	08:19 16:05	07:09 17:18	05:53 18:20	05:29 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:21 21:33	04:00 22:04	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:16
26	08:15 16:10	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:41 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:17
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:01 22:04	04:43 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:26	08:43 15:17
28	08:11 16:14	06:59 17:27	05:42 18:29	05:18 20:37	04:16 21:39	04:01 22:03	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 19:31	05:42 19:31	05:16 20:40	04:14 21:40	04:02 22:03	04:47 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:19	06:56 19:34	05:40 19:34	05:13 20:42	04:13 21:42	04:03 22:03	04:49 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:54 19:36	05:38 19:36	05:11 21:43	04:12 21:43	04:01 22:03	04:51 21:20	05:56 20:03	07:08 16:18	07:08 15:22	08:43 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:21>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (892)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:09 20:46	04:09 21:47	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:00	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:19 16:06	08:22 15:17
6	08:40 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:46	07:12 18:23	07:22 16:04	08:24 15:16
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:02	08:26 15:16
8	08:39 15:33	07:48 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:54	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:01	04:02 21:55	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:28 15:14
10	08:37 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:36 15:38	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:45 21:08	04:00 21:58	04:17 21:53	05:16 20:52	06:21 19:30	07:25 18:06	07:35 15:51	08:32 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:07	04:41 21:12	04:00 22:00	04:20 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	03:59 22:01	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	07:44 15:43	08:37 15:13
17	08:29 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:13
18	08:28 15:52	07:25 17:04	06:10 18:07	05:44 20:15	04:33 21:20	03:59 22:03	04:26 21:44	05:28 20:37	06:34 19:13	07:38 17:50	07:49 15:40	08:39 15:13
19	08:27 15:54	07:22 17:06	06:07 18:09	05:42 20:18	04:31 21:22	03:59 22:03	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:39 15:13
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:59 22:03	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
21	08:24 15:58	07:17 17:11	06:01 18:14	05:36 20:22	04:28 21:26	03:59 22:04	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:55 15:34	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:37	05:37 20:27	06:42 19:01	07:47 17:40	07:58 15:33	08:41 15:14
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	08:42 15:15
24	08:19 16:05	07:09 17:18	05:53 18:20	05:29 20:29	04:22 21:32	03:59 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:42 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:21 21:33	04:00 22:04	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	08:04 15:28	08:43 15:16
26	08:15 16:10	07:04 17:22	05:47 18:25	05:23 20:33	04:19 21:35	04:00 22:04	04:41 21:30	05:45 20:16	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:17
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:17 21:37	04:01 22:04	04:43 21:28	05:47 20:14	06:53 18:47	06:59 16:27	08:08 15:26	08:43 15:17
28	08:11 16:14	06:59 17:27	05:42 18:29	05:18 20:37	04:16 21:39	04:01 22:03	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:43 15:18
29	08:10 16:16	06:59 19:31	05:42 19:31	05:16 20:40	04:14 21:40	04:02 22:03	04:47 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:19	06:56 19:34	05:40 19:34	05:13 20:42	04:13 21:42	04:03 22:03	04:49 21:22	05:54 20:05	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:54 19:36	05:38 19:36	05:11 21:43	04:12 21:43	04:01 22:03	04:51 21:20	05:56 20:03	07:08 16:18	07:08 15:22	08:43 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:23>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (893)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:24	08:01 16:26	06:54 17:31	06:28 19:40	05:09 20:46	04:09 21:46	04:05 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:06 22:00	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:29	07:55 16:33	06:45 17:38	06:20 19:47	05:01 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:19 16:06	08:22 15:17
6	08:40 15:30	07:53 16:35	06:43 17:40	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:46	07:12 18:22	07:22 16:04	08:24 15:16
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:43	07:14 18:20	07:24 16:02	08:25 15:16
8	08:39 15:33	07:48 16:40	06:37 17:45	06:11 19:53	04:54 20:59	04:03 21:54	04:11 21:57	05:07 21:02	06:13 19:41	07:16 18:17	07:26 15:59	08:27 15:15
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:01	04:02 21:55	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:28 15:14
10	08:37 15:37	07:44 16:45	06:32 17:49	06:06 19:58	04:50 21:03	04:02 21:56	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:36 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:57	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:13
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:46 21:08	04:00 21:58	04:17 21:53	05:16 20:52	06:21 19:30	07:25 18:06	07:35 15:51	08:32 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:03	07:38 15:49	08:34 15:13
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:07	04:41 21:12	04:00 22:00	04:20 21:50	05:20 20:47	06:25 19:24	07:30 18:01	07:40 15:47	08:35 15:13
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31	08:06 16:21		06:33 19:36		04:12 21:43		04:51 21:20	05:56 20:03		07:08 16:18		08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:24>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (911)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:03 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:25	08:01 16:26	06:54 17:31	06:28 19:40	05:09 20:46	04:09 21:46	04:05 22:02	04:55 21:15	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:06 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:57 16:31	06:48 17:36	06:22 19:45	05:04 20:51	04:07 21:49	04:07 22:00	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
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11	08:36 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:57	04:15 21:54	05:14 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:14
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	04:46 21:08	04:01 21:58	04:17 21:52	05:16 20:52	06:21 19:30	07:25 18:06	07:35 15:51	08:32 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:04	07:38 15:49	08:34 15:13
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16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	04:37 21:16	03:59 22:01	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:56	07:44 15:43	08:37 15:13
17	08:29 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:25 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	08:38 15:13
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20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	03:59 22:03	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:13
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27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:26	08:43 15:18
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29	08:09 16:17	06:59 19:31	05:39 19:31	05:16 20:40	04:15 21:40	04:02 22:03	04:47 21:24	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:20
30	08:07 16:19	06:56 19:34	05:36 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:49 21:22	05:54 20:05	06:59 18:39	07:06 16:20	08:13 15:22	08:43 15:21
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Total, worst case												
Sun reduction												
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Wind dir. red.												
Total reduction												
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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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:26>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (903)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:36	07:10 16:15	08:16 15:21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:09 20:46	04:09 21:47	04:05 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
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11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:32	07:23 18:09	07:33 15:53	08:31 15:14
12	08:36 15:40	07:39 16:49	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:52	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	04:43 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:23 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:52 20:09	04:39 21:14	03:59 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:27>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (871)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
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3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	05:06 20:48	04:08 21:48	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: LÖVSEHULT 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (874)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:15 15:21
2	08:42 15:24	08:01 16:26	06:54 17:31	06:28 19:40	05:08 20:46	04:09 21:46	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
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29	08:09 16:16	06:59 17:31	05:42 18:31	05:16 20:40	04:14 21:40	04:02 22:03	21:06 (B0024) 04:47	05:52 20:08	06:57 18:42	07:03 16:22	08:12 15:23	08:43 15:19
30	08:08 16:19	06:59 17:34	05:42 18:34	05:13 20:42	04:13 21:42	04:03 22:03	21:07 (B0024) 04:49	05:54 20:05	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
31	08:06 16:21	06:59 17:36	05:42 18:36	05:13 20:42	04:13 21:42	04:03 22:03	21:07 (B0024) 04:49	05:54 20:05	06:59 18:39	07:06 16:20	08:14 15:22	08:43 15:20
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
Total, worst case						226						
Sun reduction						0,43						
Oper. time red.						0,99						
Wind dir. red.						0,57						
Total reduction						0,24						
Total, real						54						

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NAREBO 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0.0° Slope: 0.0° (848)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January	February	March		April	May	June	July	August	September		October		November	December	
1	08:44	08:04	06:57		06:31	05:11	04:11	04:04	04:53	05:58		07:02		07:43 (B0001)	07:11	08:16
	15:23	16:24	17:29		19:39	20:45	21:46	22:03	21:19	20:01		18:37	14	07:57 (B0001)	16:16	15:21
2	08:43	08:02	06:54		06:28	05:09	04:09	04:05	04:55	06:01		07:04		07:43 (B0001)	07:13	08:18
	15:25	16:26	17:32		19:41	20:47	21:47	22:03	21:16	19:58		18:34	16	07:59 (B0001)	16:13	15:20
3	08:43	08:00	06:51		06:26	05:06	04:08	04:06	04:57	06:03		07:06		07:42 (B0001)	07:16	08:20
	15:26	16:28	17:34		19:43	20:49	21:49	22:02	21:14	19:55		18:31	17	07:59 (B0001)	16:11	15:19
4	08:42	07:58	06:49		06:23	05:04	04:07	04:07	04:59	06:05		07:08		07:41 (B0001)	07:18	08:22
	15:27	16:31	17:36		19:45	20:51	21:50	22:01	21:12	19:52		18:28	17	07:58 (B0001)	16:09	15:18
5	08:42	07:56	06:46		06:20	05:02	04:06	04:08	05:01	06:07		07:11		07:41 (B0001)	07:20	08:23
	15:29	16:33	17:39	5	07:18 (B0001)	19:47	20:54	21:52	22:01	21:10	19:50	18:26	16	07:57 (B0001)	16:06	15:17
6	08:41	07:54	06:43		06:17	04:59	04:05	04:09	05:03	06:09		07:13		07:42 (B0001)	07:22	08:25
	15:30	16:35	17:41	9	07:19 (B0001)	19:50	20:56	21:53	22:00	21:07	19:47	18:23	14	07:56 (B0001)	16:04	15:16
7	08:41	07:51	06:41		06:15	04:57	04:04	04:10	05:05	06:11		07:15		07:45 (B0001)	07:25	08:26
	15:32	16:38	17:43	13	07:20 (B0001)	19:52	20:58	21:54	21:59	21:05	19:44	18:20	11	07:56 (B0001)	16:02	15:16
8	08:40	07:49	06:38		06:12	04:55	04:03	04:11	05:07	06:13		07:17		07:47 (B0001)	07:27	08:28
	15:33	16:40	17:45	16	07:21 (B0001)	19:54	21:00	21:55	21:58	21:03	19:41	18:17	7	07:54 (B0001)	16:00	15:15
9	08:39	07:47	06:35		06:09	04:52	04:02	04:12	05:10	06:15		07:19		07:49 (B0001)	07:29	08:29
	15:35	16:43	17:48	17	07:21 (B0001)	19:56	21:02	21:56	21:57	21:00	19:39	18:15	2	07:51 (B0001)	15:58	15:14
10	08:38	07:45	06:32		06:06	04:50	04:02	04:14	05:12	06:18		07:21			07:32	08:31
	15:37	16:45	17:50	17	07:21 (B0001)	19:58	21:04	21:57	21:56	20:58	19:36	18:12			15:55	15:14
11	08:37	07:42	06:30		06:04	04:48	04:01	04:15	05:14	06:20		07:24			07:34	08:32
	15:39	16:47	17:52	17	07:20 (B0001)	20:01	21:06	21:58	21:55	20:55	19:33	18:09			15:53	15:14
12	08:36	07:40	06:27		06:04	04:46	04:01	04:17	05:16	06:22		07:26			07:36	08:33
	15:41	16:50	17:54	15	07:19 (B0001)	20:03	21:09	21:59	21:53	20:53	19:30	18:07			15:51	15:13
13	08:35	07:38	06:24		06:05	04:44	04:00	04:18	05:18	06:24		07:28			07:38	08:35
	15:42	16:52	17:57	13	07:18 (B0001)	20:05	21:11	22:00	21:52	20:51	19:27	18:04			15:49	15:13
14	08:34	07:35	06:21		06:06 (B0001)	05:55	04:41	04:00	04:20	05:20	06:26	07:30			07:41	08:36
	15:44	16:54	17:59	10	07:16 (B0001)	20:07	21:13	22:01	21:51	20:48	19:25	18:01			15:47	15:13
15	08:33	07:33	06:19		05:53	04:39	03:59	04:21	05:22	06:28		07:32			07:43	08:37
	15:46	16:57	18:01		05:50	04:37	03:59	04:21	05:22	06:28		07:32			15:45	15:13
16	08:32	07:30	06:16		05:50	04:37	03:59	04:23	05:24	06:30		07:35			07:45	08:38
	15:48	16:59	18:03		05:47	04:35	03:59	04:25	05:27	06:32		07:36			15:43	15:13
17	08:30	07:28	06:13		05:47	04:35	03:59	04:25	05:27	06:32		07:37			07:47	08:39
	15:50	17:02	18:06		05:45	04:33	03:59	04:26	05:29	06:34		07:39			15:42	15:13
18	08:29	07:25	06:10		05:45	04:33	03:59	04:26	05:29	06:34		07:39			15:40	15:13
	15:52	17:04	18:08		05:42	04:31	03:59	04:28	05:31	06:36		07:41			15:40	15:13
19	08:27	07:23	06:08		05:42	04:31	03:59	04:28	05:31	06:36		07:41			15:40	15:13
	15:54	17:06	18:10		05:39	04:30	03:59	04:30	05:33	06:39		07:44			15:38	15:13
20	08:26	07:20	06:05		05:39	04:30	03:59	04:30	05:33	06:39		07:44			15:36	15:13
	15:57	17:09	18:12		05:37	04:28	03:59	04:32	05:35	06:41		07:46			15:35	15:14
21	08:24	07:18	06:02		05:37	04:28	03:59	04:32	05:35	06:41		07:46			15:33	15:14
	15:59	17:11	18:14		05:34	04:26	03:59	04:33	05:37	06:43		07:48			15:32	15:15
22	08:23	07:15	05:59		05:34	04:26	03:59	04:33	05:37	06:43		07:48			15:30	15:14
	16:01	17:13	18:17		05:31	04:24	03:59	04:35	05:39	06:45		07:50			15:29	15:16
23	08:21	07:13	05:56		05:31	04:24	03:59	04:35	05:39	06:45		07:50			15:27	15:17
	16:03	17:16	18:19		05:29	04:22	03:59	04:37	05:41	06:47		07:53			15:26	15:18
24	08:19	07:10	05:54		05:29	04:22	03:59	04:37	05:41	06:47		07:53			15:24	15:19
	16:05	17:18	18:21		05:26	04:21	04:00	04:39	05:44	06:49		07:55			15:23	15:20
25	08:18	07:07	05:51		05:26	04:21	04:00	04:39	05:44	06:49		07:55			15:22	15:19
	16:08	17:20	18:23		05:24	04:19	04:00	04:41	05:46	06:51		07:57			15:21	15:18
26	08:16	07:05	05:48		05:24	04:19	04:00	04:41	05:46	06:51		07:57			15:20	15:17
	16:10	17:23	18:25		05:21	04:18	04:01	04:43	05:48	06:53		07:59			15:19	15:16
27	08:14	07:02	05:45		05:21	04:18	04:01	04:43	05:48	06:53		07:59			15:18	15:15
	16:12	17:25	18:28		05:19	04:16	04:01	04:45	05:50	06:56		08:01			15:17	15:14
28	08:12	06:59	05:42		05:19	04:16	04:01	04:45	05:50	06:56		08:01			15:16	15:13
	16:14	17:27	18:30		05:18	04:15	04:02	04:47	05:52	06:58		08:04			15:15	15:12
29	08:10		06:40		05:16	04:15	04:02	04:47	05:52	06:58		08:04			15:14	15:11
	16:17		19:32		05:14	04:13	04:03	04:49	05:54	07:00		08:06			15:13	15:10
30	08:08		06:37		05:14	04:13	04:03	04:49	05:54	07:00		08:06			15:12	15:09
	16:19		19:34		05:13	04:12	04:02	04:48	05:53	07:00		08:07			15:11	15:08
31	08:06		06:34		05:12	04:11	04:01	04:47	05:52	07:00		08:07			15:10	15:07
	16:21		19:36		05:11	04:10	04:00	04:46	05:51	07:01		08:08			15:09	15:06
Potential sun hours	228	262	366		429	515	539	538	474	386		321			241	207
Total, worst case			132									114				
Sun reduction			0.22								0.31	0.26				
Oper. time red.			0.99								0.99	0.99				
Wind dir. red.			0.59								0.59	0.59				
Total reduction			0.13								0.18	0.15				
Total, real			17								3	17				

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NAREBO 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0.0° Slope: 0.0° (878)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March		April	May	June	July	August	September		October		November	December	
1	08:44	08:04	06:57		06:31	05:11	04:11	04:04	04:53	05:58		07:02		07:46 (B0001)	07:11	08:16
	15:23	16:24	17:29		19:39	20:45	21:46	22:03	21:19	20:01		18:37	12	07:58 (B0001)	16:16	15:21
2	08:43	08:02	06:54		06:28	05:09	04:09	04:05	04:55	06:01		07:04		07:46 (B0001)	07:13	08:18
	15:25	16:26	17:32		19:41	20:47	21:47	22:03	21:16	19:58		18:34	13	07:59 (B0001)	16:13	15:20
3	08:43	08:00	06:51		06:26	05:06	04:08	04:06	04:57	06:03		07:06		07:44 (B0001)	07:16	08:20
	15:26	16:28	17:34		19:43	20:49	21:49	22:02	21:14	19:55		18:31	16	08:00 (B0001)	16:11	15:19
4	08:42	07:58	06:49		06:23	05:04	04:07	04:07	04:59	06:05		07:08		07:43 (B0001)	07:18	08:22
	15:27	16:31	17:36	4	07:20 (B0001)	19:45	20:51	21:50	22:01	21:12	19:52	18:28	17	08:00 (B0001)	16:09	15:18
5	08:42	07:56	06:46		06:20	05:02	04:06	04:08	05:01	06:07		07:11		07:43 (B0001)	07:20	08:23
	15:29	16:33	17:39	8	07:21 (B0001)	19:47	20:54	21:52	22:01	21:10	19:50	18:26	16	07:59 (B0001)	16:06	15:17
6	08:41	07:54	06:43		06:17	04:59	04:05	04:09	05:03	06:09		07:13		07:43 (B0001)	07:22	08:25
	15:30	16:35	17:41	12	07:22 (B0001)	19:50	20:56	21:53	22:00	21:07	19:47	18:23	16	07:59 (B0001)	16:04	15:16
7	08:41	07:51	06:41		06:15	04:57	04:04	04:10	05:05	06:11		07:15		07:45 (B0001)	07:25	08:26
	15:32	16:38	17:43	15	07:22 (B0001)	19:52	20:58	21:54	21:59	21:05	19:44	18:20	14	07:59 (B0001)	16:02	15:16
8	08:40	07:49	06:38		06:12	04:55	04:03	04:11	05:07	06:13		07:17		07:47 (B0001)	07:27	08:28
	15:33	16:40	17:45	16	07:23 (B0001)	19:54	21:00	21:55	21:58	21:03	19:41	18:17	10	07:57 (B0001)	16:00	15:15
9	08:39	07:47	06:35		06:09	04:52	04:02	04:12	05:10	06:15		07:19		07:49 (B0001)	07:29	08:29
	15:35	16:43	17:48	17	07:23 (B0001)	19:56	21:02	21:56	21:57	21:00	19:39	18:15	6	07:55 (B0001)	15:58	15:14
10	08:38	07:45	06:32		06:06	04:50	04:02	04:14	05:12	06:18		07:21		07:52 (B0001)	07:32	08:31
	15:37	16:45	17:50	16	07:22 (B0001)	19:58	21:04	21:57	21:56	20:58	19:36	18:12	1	07:53 (B0001)	15:55	15:14
11	08:37	07:42	06:30		06:06 (B0001)	06:04	04:48	04:01	04:15	05:14	06:20	07:24			07:34	08:32
	15:39	16:47	17:52	15	07:21 (B0001)	20:01	21:06	21:58	21:55	20:55	19:33	18:09			15:53	15:14
12	08:36	07:40	06:27		06:07 (B0001)	06:01	04:46	04:01	04:17	05:16	06:22	07:26			07:36	08:33
	15:41	16:50	17:54	12	07:19 (B0001)	20:03	21:09	21:59	21:53	20:53	19:30	18:07			15:51	15:13
13	08:35	07:38	06:24		07:09 (B0001)	05:58	04:44	04:00	04:18	05:18	06:24	07:28			07:38	08:35
	15:42	16:52	17:57	9	07:18 (B0001)	20:05	21:11	22:00	21:52	20:51	19:27	18:04			15:49	15:13
14	08:34	07:35	06:21		05:55	04:41	04:00	04:20	05:20	06:26		07:30			07:41	08:36
	15:44	16:54	17:59		20:07	21:13	22:01	21:51	20:48	19:25		18:01			15:47	15:13
15	08:33	07:33	06:19		05:53	04:39	03:59	04:21	05:22	06:28		07:32			07:43	08:37
	15:46	16:57	18:01		20:09	21:15	22:02	21:49	20:46	19:22		17:59			15:45	15:13
16	08:32	07:30	06:16		05:50	04:37	03:59	04:23	05:24	06:30		07:35			07:45	08:38
	15:48	16:59	18:03		20:12	21:17	22:02	21:48	20:43	19:19		17:56			15:43	15:13
17	08:30	07:28	06:13		05:47	04:35	03:59	04:25	05:27	06:32		07:37			07:47	08:39
	15:50	17:02	18:06		20:14	21:19	22:03	21:47	20:41	19:16		17:53			15:42	15:13
18	08:29	07:25	06:10		05:45	04:33	03:59	04:26	05:29	06:34		07:39			07:50	08:40
	15:52	17:04	18:08		20:16	21:21	22:03	21:45	20:38	19:13		17:51			15:40	15:13
19	08:27	07:23	06:08		05:42	04:31	03:59	04:28	05:31	06:36		07:41			07:52	08:40
	15:54	17:06	18:10		20:18	21:23	22:04	21:43	20:35	19:10		17:48			15:38	15:13
20	08:26	07:20	06:05		05:39	04:30	03:59	04:30	05:33	06:39		07:44			07:54	08:41
	15:57	17:09	18:12		20:20	21:25	22:04	21:42	20:33	19:08		17:45			15:36	15:13
21	08:24	07:18	06:02		05:37	04:28	03:59	04:32	05:35	06:41		07:46			07:56	08:42
	15:59	17:11	18:14		20:23	21:27	22:05	21:40	20:30	19:05		17:43			15:35	15:14
22	08:23	07:15	05:59		05:34	04:26	03:59	04:33	05:37	06:43		07:48			07:58	08:42
	16:01	17:13	18:17		20:25	21:29	22:05	21:38	20:28	19:02		17:40			15:33	15:14
23	08:21	07:13	05:56		05:31	04:24	03:59	04:35	05:39	06:45		07:50			08:00	08:43
	16:03	17:16	18:19		20:27	21:31	22:05	21:36	20:25	18:59		17:38			15:32	15:15
24	08:19	07:10	05:54		05:29	04:22	03:59	04:37	05:41	06:47		07:53			08:02	08:43
	16:05	17:18	18:21		20:29	21:32	22:05	21:35	20:22	18:56		17:35			15:30	15:15
25	08:18	07:07	05:51		05:26	04:21	04:00	04:39	05:44	06:49		06:55			08:05	08:44
	16:08	17:20	18:23		20:31	21:34	22:05	21:33	20:20	18:54		16:33			15:29	15:16
26	08:16	07:05	05:48		05:24	04:19	04:00	04:41	05:46	06:51		06:57			08:07	08:44
	16:10	17:23	18:25		20:34	21:36	22:05	21:31	20:17	18:51		16:30			15:27	15:17
27	08:14	07:02	05:45		05:21	04:18	04:01	04:43	05:48	06:53		06:59			08:09	08:44
	16:12	17:25	18:28		20:36	21:38	22:05	21:29	20:14	18:48		16:28			15:26	15:18
28	08:12	06:59	05:42		05:19	04:16	04:01	04:45	05:50	06:56		07:02			08:11	08:44
	16:14	17:27	18:30		20:38	21:39	22:04	21:27	20:12	18:45		16:25			15:24	15:19
29	08:10		06:40		05:16	04:15	04:02	04:47	05:52	06:58		07:04			08:12	08:44
	16:17		19:32		20:40	21:41	22:04	21:25	20:09	18:42		16:23			15:23	15:20
30	08:08		06:37		05:14	04:13	04:03	04:49	05:54	07:00		07:06		07:49 (B0001)	08:14	08:44
	16:19		19:34		20:43	21:43	22:04	21:23	20:06	18:40		16:20		07:55 (B0001)	15:22	15:21
31	08:06		06:34			04:12		04:51	05:56			07:09				08:44
	16:21		19:36			21:44		21:21	20:03			16:18				15:22
Potential sun hours	228	262	366		429	515	539	538	474	386		321		241	207	
Total, worst case																
Sun reduction			124									6				
Oper. time red.			0.22									0.31				
Wind dir. red.			0.99									0.99				
Total reduction			0.59									0.59				
Total, real			0.13									0.18				
			16									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)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NODJEHULT 1:10>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (826)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:09	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:54	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 20:59	04:04 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:38 15:35	07:46 16:43	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:33	07:23 18:09	07:33 15:53	08:31 15:14
12	08:36 15:41	07:39 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:40 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	03:59 22:02	04:23 21:47	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:44	08:37 15:13
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19	08:27 15:55	07:22 17:06	06:07 18:10	05:42 20:18	04:32 21:22	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	08:25 15:57	07:20 17:09	06:04 18:12	05:39 20:20	04:30 21:24	03:59 22:03	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:14
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:39	05:35 20:30	06:40 19:05	07:45 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:24	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
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27	08:13 16:12	07:02 17:25	05:45 18:27	05:21 20:35	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:43 15:18
28	08:12 16:14	06:59 17:27	05:42 18:29	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:25	08:43 15:19
29	08:10 16:17	06:59 19:32	05:42 20:40	05:16 21:40	04:15 22:03	04:02 21:24	04:47 20:08	05:52 18:42	06:57 16:23	07:04 15:23	08:12 15:20	08:43 15:20
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	208
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (910)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (885)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:09	08:21 15:18
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6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:54	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:17
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8	08:39 15:34	07:49 16:45	06:38 17:45	06:12 19:54	04:55 20:59	04:04 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:38 15:35	07:46 16:43	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	208
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 1:9>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (840)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NODJEHULT 2:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (863)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:10 16:15	08:15 15:21
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31	08:06 16:21	06:54 17:36	05:38 18:36	05:15 20:44	04:12 21:44	04:01 22:03	04:51 21:20	05:56 20:03	07:08 16:18	07:08 15:22	08:43 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	242	208
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
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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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NODJEHULT 2:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (813)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:09	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:40	06:43 17:45	06:17 19:54	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:04	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:45	06:38 17:45	06:12 19:54	04:55 20:59	04:04 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:38 15:35	07:46 16:43	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:33	07:23 18:09	07:33 15:53	08:31 15:14
12	08:36 15:41	07:39 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 21:59	04:18 21:51	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:40 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
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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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NODJEHULT 2:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (839)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:10 16:15	08:16 15:21
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Total, worst case												
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	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
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SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NODJEHULT 2:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (899)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
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13	08:35 15:43	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 21:59	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:40 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
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Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	208
Total, worst case												
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Table layout: For each day in each month the following matrix apply

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SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 4:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (864)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:02	04:53 21:18	05:58 20:00	07:02 18:37	07:10 16:15	08:15 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:09 21:47	04:05 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:13	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:57 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:49	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:22 15:17
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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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 5:2>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (814)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
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	Minutes with flicker		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 5.3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (886)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:09	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:39 15:35	07:46 16:43	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:33	07:23 18:09	07:33 15:53	08:31 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:39 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	03:59 22:02	04:23 21:47	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:44	08:37 15:13
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:25 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:28 15:52	07:25 17:04	06:10 18:08	05:45 20:16	04:33 21:20	03:59 22:03	04:26 21:44	05:29 20:38	06:34 19:13	07:39 17:50	07:49 15:40	08:39 15:13
19	08:27 15:55	07:22 17:06	06:07 18:10	05:42 20:18	04:32 21:22	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	08:25 15:57	07:20 17:09	06:04 18:12	05:39 20:20	04:30 21:24	03:59 22:04	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:14
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:39	05:35 20:30	06:40 19:05	07:45 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:23 21:32	04:00 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:04	04:39 21:32	05:44 20:19	06:49 18:53	06:55 16:33	08:04 15:29	08:43 15:16
26	08:15 16:10	07:04 17:22	05:48 18:25	05:24 20:33	04:19 21:35	04:01 22:04	04:41 21:30	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:35	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:43 15:18
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:25	08:43 15:19
29	08:10 16:17	06:59 19:32	05:42 20:40	05:16 21:41	04:15 22:03	04:02 21:24	04:47 20:08	05:52 18:42	06:57 16:23	07:04 15:23	08:12 15:20	08:43 15:20
30	08:08 16:19	06:57 19:34	05:41 20:42	05:14 21:42	04:13 22:03	04:03 21:22	04:49 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:43 15:21
31	08:06 16:21	06:54 19:36	05:39 20:44	05:12 21:44	04:11 22:04	04:01 21:20	04:51 20:03	05:56 16:18	07:08 15:22	07:08 15:22	08:16 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: NÖDJEHULT 5.3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (912)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:44	04:11 21:45	04:04 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:40	05:09 20:46	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:17 15:20
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	04:08 21:48	04:06 22:01	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:19 15:19
4	08:42 15:27	07:58 16:31	06:48 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:11	06:05 19:52	07:08 18:28	07:17 16:09	08:21 15:18
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:49	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:52	04:09 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:17
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	04:04 21:53	04:10 21:58	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:16
8	08:39 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:27 15:15
9	08:39 15:35	07:46 16:43	06:35 17:47	06:09 19:56	04:52 21:02	04:03 21:56	04:13 21:56	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:55	05:12 20:57	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:19 19:33	07:23 18:09	07:33 15:53	08:31 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:02	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:56	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:00	04:20 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:13
15	08:32 15:46	07:32 16:57	06:18 18:01	05:53 20:09	04:39 21:14	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	03:59 22:02	04:23 21:47	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:44	08:37 15:13
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	03:59 22:02	04:25 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:28 15:52	07:25 17:04	06:10 18:08	05:45 20:16	04:33 21:20	03:59 22:03	04:26 21:44	05:29 20:38	06:34 19:13	07:39 17:50	07:49 15:40	08:39 15:13
19	08:27 15:55	07:22 17:06	06:07 18:10	05:42 20:18	04:32 21:22	03:59 22:03	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:51 15:38	08:40 15:13
20	08:25 15:57	07:20 17:09	06:04 18:12	05:39 20:20	04:30 21:24	03:59 22:04	04:30 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	08:40 15:14
21	08:24 15:59	07:17 17:11	06:02 18:14	05:37 20:22	04:28 21:26	03:59 22:04	04:32 21:39	05:35 20:30	06:40 19:05	07:45 17:43	07:56 15:35	08:41 15:14
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:19	05:31 20:27	04:24 21:30	03:59 22:04	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:23 21:32	04:00 22:04	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:04	04:39 21:32	05:44 20:19	06:49 18:53	06:55 16:33	08:04 15:29	08:43 15:16
26	08:15 16:10	07:04 17:22	05:48 18:25	05:24 20:33	04:19 21:35	04:01 22:04	04:41 21:30	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:35	04:18 21:37	04:01 22:04	04:43 21:28	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:43 15:18
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:25	08:43 15:19
29	08:10 16:17	06:59 19:32	05:42 20:40	05:16 21:41	04:15 22:03	04:02 21:24	04:47 20:08	05:52 18:42	06:57 16:23	07:04 15:23	08:12 15:20	08:43 15:20
30	08:08 16:19	06:57 19:34	05:41 20:42	05:14 21:42	04:13 22:03	04:03 21:22	04:49 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:43 15:21
31	08:06 16:21	06:54 19:36	05:39 20:44	05:12 21:44	04:11 22:04	04:01 21:20	04:51 20:03	05:56 16:18	07:08 15:22	07:08 15:22	08:16 15:22	08:43 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÄLEN 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (917)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23 36	14:50 (B0018) 15:32 (B0019) 17:29	16:21 (B0017) 16:59 (B0022) 19:38	05:11 20:44	04:10 21:45
2	08:43 15:24	08:02 16:26 32	14:51 (B0018) 15:31 (B0019) 17:31	16:21 (B0017) 17:01 (B0012) 19:40	05:08 20:46	04:09 21:47
3	08:42 15:25	08:00 16:28 25	14:53 (B0018) 15:29 (B0019) 17:34	16:21 (B0017) 17:03 (B0012) 19:43	05:06 20:49	04:08 21:48
4	08:42 15:27	07:58 16:30 17	14:54 (B0018) 15:11 (B0018) 17:36	16:22 (B0017) 17:06 (B0012) 19:45	05:04 20:51	04:07 21:50
5	08:41 15:28	07:55 16:33 13	14:56 (B0018) 15:09 (B0018) 17:38	16:23 (B0017) 17:08 (B0012) 19:47	05:01 20:53	04:06 21:51
6	08:41 15:30	07:53 16:35 6	15:00 (B0018) 15:06 (B0018) 17:40	16:24 (B0017) 17:07 (B0012) 19:49	04:59 20:55	04:05 21:52
7	08:40 15:31	07:51 16:37	06:40 17:43 33	16:25 (B0017) 17:07 (B0012) 19:51	04:57 20:57	04:04 21:54
8	08:39 15:33	07:49 16:40	06:37 17:45 28	16:28 (B0017) 17:07 (B0012) 19:54	04:54 21:00	04:03 21:55
9	08:39 15:35	07:46 16:42	06:35 17:47 16	16:50 (B0012) 17:06 (B0012) 19:56	04:52 21:02	04:02 21:56
10	08:38 15:37	07:44 16:45 1	16:09 (B0025) 16:10 (B0025) 17:50	16:51 (B0012) 17:05 (B0012) 19:58	04:50 21:04	04:01 21:57
11	08:37 15:38 3	14:52 (B0018) 14:55 (B0018) 16:47 5	07:42 16:08 (B0025) 17:52 11	06:29 16:52 (B0012) 20:00	06:03 21:06	04:01 21:58
12	08:36 15:40 6	14:51 (B0018) 14:57 (B0018) 16:49 9	07:39 16:07 (B0025) 17:54 5	06:27 16:55 (B0012) 20:02	04:45 21:08	04:00 21:59
13	08:35 15:42 10	14:49 (B0018) 14:59 (B0018) 16:52 12	07:37 16:07 (B0025) 17:56	06:24 16:19 (B0025) 20:05	04:43 21:10	04:00 22:00
14	08:34 15:44 13	14:49 (B0018) 15:02 (B0018) 16:54 15	07:35 16:06 (B0025) 17:58	06:21 16:21 (B0025) 20:07	04:41 21:12	03:59 22:01
15	08:32 15:46 15	14:48 (B0018) 15:03 (B0018) 16:56 16	07:32 16:06 (B0025) 18:01	06:18 16:22 (B0025) 20:09	04:39 21:14	03:59 22:01
16	08:31 15:48 18	14:48 (B0018) 15:06 (B0018) 16:59 17	07:30 16:06 (B0025) 18:03	06:15 16:23 (B0025) 20:11	04:37 21:16	03:59 22:02
17	08:30 15:50 21	14:47 (B0018) 15:08 (B0018) 17:01 16	07:27 16:06 (B0025) 18:05	06:13 16:22 (B0025) 20:13	04:35 21:18	03:58 22:02
18	08:28 15:52 22	14:47 (B0018) 15:09 (B0018) 17:03 14	07:25 16:08 (B0025) 18:07	06:10 16:22 (B0025) 20:16	04:33 21:20	03:58 22:03
19	08:27 15:54 24	14:46 (B0018) 15:10 (B0018) 17:06 12	07:22 16:09 (B0025) 18:10	06:07 16:21 (B0025) 20:18	04:31 21:22	03:58 22:03
20	08:25 15:56 24	14:47 (B0018) 15:11 (B0018) 17:08 8	07:20 16:10 (B0025) 18:12	06:04 16:18 (B0025) 20:20	04:29 21:24	03:58 22:04
21	08:24 15:58 27	14:47 (B0018) 15:19 (B0019) 17:11 9	07:17 16:30 (B0017) 18:14	06:02 16:39 (B0017) 20:22	04:27 21:26	03:58 22:04
22	08:22 16:01 32	14:46 (B0018) 15:21 (B0019) 17:13 15	07:15 16:27 (B0017) 18:16	05:59 16:42 (B0017) 20:24	04:26 21:28	03:59 22:04
23	08:21 16:03 35	14:46 (B0018) 15:24 (B0019) 17:15 18	07:12 16:25 (B0017) 18:18	05:56 16:43 (B0017) 20:27	04:24 21:30	03:59 22:04
24	08:19 16:05 37	14:47 (B0018) 15:26 (B0019) 17:18 20	07:10 16:24 (B0017) 18:21	05:53 16:44 (B0017) 20:29	04:22 21:32	03:59 22:04
25	08:17 16:07 40	14:47 (B0018) 15:29 (B0019) 17:20 23	07:07 16:23 (B0017) 18:23	05:50 16:46 (B0017) 20:31	04:20 21:34	04:00 22:04
26	08:15 16:09 43	14:47 (B0018) 15:31 (B0019) 17:22 24	07:04 16:22 (B0017) 18:25	05:48 16:46 (B0017) 20:33	04:19 21:36	04:00 22:04
27	08:14 16:12 45	14:47 (B0018) 15:33 (B0019) 17:24 25	07:02 16:21 (B0017) 18:27	05:45 16:46 (B0017) 20:35	04:17 21:37	04:01 22:04
28	08:12 16:14 44	14:47 (B0018) 15:33 (B0019) 17:27 27	06:59 16:21 (B0017) 18:29	05:42 16:21 (B0017) 20:38	04:16 21:39	04:01 22:04
29	08:10 16:16 43	14:48 (B0018) 15:33 (B0019) 17:27 27	06:39 19:32	05:16 20:40	04:14 21:41	04:02 22:04
30	08:08 16:19 42	14:49 (B0018) 15:33 (B0019) 17:27 27	06:36 19:34	05:13 20:42	04:13 21:42	04:03 22:03
31	08:06 16:21 40	14:50 (B0018) 15:33 (B0019) 17:27 27	06:34 19:36	04:11 21:44	04:11 21:44	04:03 22:03
Potential sun hours	228	262	366	429	515	539
Total, worst case	584	415	318			
Sun reduction	0,19	0,16	0,22			
Oper. time red.	0,99	0,99	0,99			
Wind dir. red.	0,69	0,69	0,68			
Total reduction	0,13	0,11	0,15			
Total, real	74	46	47			

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:3>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (917)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	17:31 (B0012) 16:13	14:34 (B0018) 15:20
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	17:29 (B0012) 16:10	14:37 (B0018) 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	17:28 (B0012) 16:08	14:38 (B0018) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	17:07 (B0017) 16:06	14:29 (B0018) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	17:03 (B0017) 16:04	14:26 (B0018) 15:16
7	04:10 21:58	05:05 21:05	06:11 19:44	07:14 18:20	17:00 (B0017) 16:01	14:24 (B0018) 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:17	16:59 (B0017) 15:59	14:22 (B0018) 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	16:57 (B0017) 15:57	14:22 (B0018) 15:14
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	16:56 (B0017) 15:55	14:20 (B0018) 15:14
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	16:55 (B0017) 15:53	14:20 (B0018) 15:13
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	16:55 (B0017) 15:51	14:19 (B0018) 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	16:54 (B0017) 15:49	14:20 (B0018) 15:13
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	16:54 (B0017) 15:47	14:20 (B0018) 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:55 (B0017) 15:45	14:19 (B0018) 15:12
16	04:22 21:48	05:24 20:43	06:30 19:18	07:34 17:55	16:54 (B0017) 15:43	14:20 (B0018) 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	16:55 (B0017) 15:41	14:20 (B0018) 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	16:56 (B0017) 15:39	14:21 (B0018) 15:12
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:57 (B0017) 15:38	14:20 (B0018) 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:59 (B0017) 15:36	14:21 (B0018) 15:13
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42	17:02 (B0017) 15:34	14:22 (B0018) 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:40 (B0025) 15:33	14:23 (B0018) 15:14
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	16:49 (B0025) 15:31	14:23 (B0018) 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:37 (B0025) 15:30	14:24 (B0018) 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	06:54 16:32	15:37 (B0025) 15:28	14:25 (B0018) 15:16
26	04:40 21:30	05:45 20:16	06:51 18:50	06:57 16:30	15:36 (B0025) 15:27	14:26 (B0018) 15:16
27	04:42 21:28	05:47 20:14	06:53 18:48	06:59 16:27	15:36 (B0025) 15:25	14:27 (B0018) 15:17
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	15:36 (B0025) 15:24	14:29 (B0018) 15:18
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	15:36 (B0025) 15:23	14:30 (B0018) 15:19
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	15:37 (B0025) 15:22	14:32 (B0018) 15:20
31	04:50 21:20	05:56 20:03		07:08 16:17	15:38 (B0025) 15:42	14:38 (B0018) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case				608	717	65
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,68	0,69	0,69
Total reduction				0,17	0,12	0,09
Total, real				106	84	6

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (914)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January			February			March			April	May	June
1	08:43		09:28 (B0018)	08:04		15:03 (B0007)	06:57		16:00 (B0006)	06:31	05:11	04:10
	15:23	113	14:37 (B0008)	16:23	20	15:23 (B0007)	17:29	29	16:57 (B0002)	19:38	20:44	21:46
2	08:43		09:28 (B0018)	08:02		15:04 (B0007)	06:54		16:02 (B0006)	06:28	05:09	04:09
	15:24	114	14:38 (B0008)	16:26	19	15:23 (B0007)	17:31	21	16:55 (B0002)	19:40	20:47	21:47
3	08:43		09:29 (B0018)	08:00		15:05 (B0007)	06:51		16:06 (B0006)	06:25	05:06	04:08
	15:26	115	14:40 (B0008)	16:28	18	15:23 (B0007)	17:34	5	16:11 (B0006)	19:43	20:49	21:49
4	08:42		09:29 (B0018)	07:58		15:06 (B0007)	06:48			06:23	05:04	04:07
	15:27	115	14:42 (B0008)	16:30	15	15:21 (B0007)	17:36			19:45	20:51	21:50
5	08:42		09:29 (B0018)	07:56		15:08 (B0007)	06:46			06:20	05:01	04:06
	15:28	115	14:42 (B0008)	16:33	12	15:20 (B0007)	17:38			19:47	20:53	21:51
6	08:41		09:30 (B0018)	07:53		15:10 (B0007)	06:43			06:17	04:59	04:05
	15:30	114	14:42 (B0008)	16:35	8	15:18 (B0007)	17:41			19:49	20:55	21:53
7	08:40		09:30 (B0018)	07:51			06:40			06:14	04:57	04:04
	15:32	114	14:43 (B0008)	16:38			17:43			19:51	20:58	21:54
8	08:40		09:31 (B0018)	07:49			06:38			06:11	04:54	04:03
	15:33	113	14:43 (B0008)	16:40			17:45			19:54	21:00	21:55
9	08:39		09:31 (B0018)	07:47			06:35			06:09	04:52	04:02
	15:35	111	14:43 (B0008)	16:42			17:47			19:56	21:02	21:56
10	08:38		09:32 (B0018)	07:44			06:32			06:06	04:50	04:01
	15:37	110	14:44 (B0008)	16:45			17:50			19:58	21:04	21:57
11	08:37		09:32 (B0018)	07:42			06:29			06:03	04:48	04:01
	15:38	107	14:43 (B0008)	16:47			17:52			20:00	21:06	21:58
12	08:36		09:33 (B0018)	07:40		16:06 (B0006)	06:27			06:01	04:45	04:00
	15:40	103	14:43 (B0008)	16:49	6	16:12 (B0006)	17:54			20:02	21:08	21:59
13	08:35		09:33 (B0018)	07:37		16:03 (B0006)	06:24			05:58	04:43	04:00
	15:42	99	14:43 (B0008)	16:52	13	16:16 (B0006)	17:56			20:05	21:10	22:00
14	08:34		09:35 (B0018)	07:35		16:00 (B0006)	06:21			05:55	04:41	03:59
	15:44	93	14:43 (B0008)	16:54	18	16:18 (B0006)	17:59			20:07	21:12	22:01
15	08:32		09:35 (B0018)	07:32		15:59 (B0006)	06:18			05:52	04:39	03:59
	15:46	88	14:41 (B0008)	16:57	21	16:20 (B0006)	18:01			20:09	21:14	22:01
16	08:31		09:37 (B0018)	07:30		15:58 (B0006)	06:16			05:50	04:37	03:59
	15:48	76	14:07 (B0022)	16:59	23	16:21 (B0006)	18:03			20:11	21:17	22:02
17	08:30		09:38 (B0018)	07:27		15:57 (B0006)	06:13			05:47	04:35	03:59
	15:50	67	14:05 (B0022)	17:01	25	16:22 (B0006)	18:05			20:14	21:19	22:03
18	08:28		09:39 (B0018)	07:25		15:56 (B0006)	06:10			05:44	04:33	03:58
	15:52	52	12:18 (B0012)	17:04	27	16:23 (B0006)	18:07			20:16	21:21	22:03
19	08:27		09:43 (B0018)	07:22		15:56 (B0006)	06:07			05:42	04:31	03:58
	15:54	39	12:16 (B0012)	17:06	27	16:23 (B0006)	18:10			20:18	21:23	22:04
20	08:26		09:53 (B0017)	07:20		15:55 (B0006)	06:04			05:39	04:29	03:58
	15:56	34	15:14 (B0007)	17:08	28	16:23 (B0006)	18:12			20:20	21:24	22:04
21	08:24		09:53 (B0017)	07:17		15:55 (B0006)	06:02			05:36	04:27	03:58
	15:58	37	15:16 (B0007)	17:11	29	16:24 (B0006)	18:14			20:22	21:26	22:04
22	08:22		09:54 (B0017)	07:15		15:55 (B0006)	05:59			05:34	04:26	03:59
	16:01	38	15:18 (B0007)	17:13	29	16:24 (B0006)	18:16			20:25	21:28	22:04
23	08:21		09:55 (B0017)	07:12		15:55 (B0006)	05:56			05:31	04:24	03:59
	16:03	39	15:19 (B0007)	17:15	28	16:23 (B0006)	18:18			20:27	21:30	22:05
24	08:19		09:56 (B0017)	07:10		15:56 (B0006)	05:53			05:29	04:22	03:59
	16:05	38	15:20 (B0007)	17:18	28	16:24 (B0006)	18:21			20:29	21:32	22:05
25	08:17		09:58 (B0017)	07:07		15:56 (B0006)	05:50			05:26	04:20	04:00
	16:07	37	15:21 (B0007)	17:20	30	16:49 (B0002)	18:23			20:31	21:34	22:05
26	08:16		09:59 (B0017)	07:04		15:56 (B0006)	05:48			05:23	04:19	04:00
	16:10	36	15:22 (B0007)	17:22	33	16:52 (B0002)	18:25			20:33	21:36	22:04
27	08:14		10:02 (B0017)	07:02		15:57 (B0006)	05:45			05:21	04:17	04:01
	16:12	32	15:23 (B0007)	17:25	33	16:54 (B0002)	18:27			20:36	21:37	22:04
28	08:12		15:02 (B0007)	06:59		15:58 (B0006)	05:42			05:18	04:16	04:01
	16:14	20	15:22 (B0007)	17:27	33	16:57 (B0002)	18:29			20:38	21:39	22:04
29	08:10		15:02 (B0007)				06:39			05:16	04:14	04:02
	16:16	21	15:23 (B0007)				19:32			20:40	21:41	22:04
30	08:08		15:02 (B0007)				06:36			05:13	04:13	04:03
	16:19	21	15:23 (B0007)				19:34			20:42	21:42	22:03
31	08:06		15:03 (B0007)				06:34				04:12	
	16:21	21	15:24 (B0007)				19:36				21:44	
Potential sun hours	228			262			366			429	515	539
Total, worst case	2232			523			55					
Sun reduction	0,19			0,16			0,22					
Oper. time red.	0,99			0,99			0,99					
Wind dir. red.	0,64			0,69			0,69					
Total reduction	0,12			0,11			0,15					
Total, real	259			58			8					

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (914)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21 106
2	04:04 22:02	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	09:14 (B0018) 15:20 110
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	14:26 (B0008) 08:19 15:19 111
4	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	09:15 (B0018) 15:18 113
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	14:27 (B0008) 14:40 (B0007) 15:17 114
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	14:28 (B0008) 14:37 (B0007) 15:16 116
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	14:29 (B0008) 14:36 (B0007) 15:15 117
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	09:16 (B0018) 14:35 (B0007) 15:15 116
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	14:30 (B0008) 14:35 (B0007) 15:14 114
10	04:14 21:55	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	09:17 (B0018) 14:34 (B0007) 15:14 114
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	09:18 (B0018) 14:34 (B0007) 15:13 113
12	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	07:36 15:51	14:27 (B0008) 14:34 (B0007) 15:13 112
13	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	09:19 (B0018) 14:34 (B0007) 15:13 111
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	14:26 (B0008) 09:39 (B0017) 15:13 112
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	09:21 (B0018) 09:34 (B0017) 15:12 107
16	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:43	14:25 (B0008) 09:32 (B0017) 15:12 107
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	09:23 (B0018) 14:54 (B0007) 15:12 105
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:40	09:24 (B0018) 09:30 (B0017) 15:13 105
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:52 15:38	14:25 (B0018) 09:29 (B0017) 15:13 104
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36	09:26 (B0018) 09:29 (B0017) 15:13 103
21	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	07:56 15:34	14:26 (B0018) 09:28 (B0017) 15:13 103
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	09:27 (B0018) 09:29 (B0017) 15:14 103
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	14:27 (B0018) 09:19 (B0018) 15:14 103
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	09:27 (B0018) 09:17 (B0018) 15:15 102
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	14:27 (B0018) 09:16 (B0018) 15:16 105
26	04:41 21:31	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27	09:28 (B0018) 09:15 (B0018) 15:16 106
27	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:25	14:30 (B0008) 09:14 (B0018) 15:17 106
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	14:31 (B0008) 09:15 (B0018) 15:18 108
29	04:46 21:25	05:52 20:09	06:57 18:42	07:04 16:22	08:12 15:23	14:32 (B0008) 09:14 (B0018) 15:19 109
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22	09:27 (B0018) 09:14 (B0018) 15:20 110
31	04:51 21:20	05:56 20:03		07:08 16:18		09:28 (B0018) 08:44 15:21 110
Potential sun hours	538	474	386	321	241	207
Total, worst case				494	1083	3375
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,64	0,64
Total reduction				0,18	0,11	0,08
Total, real				87	117	280

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (913)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April	May	June
1	08:43		09:26 (B0018)	08:04		14:57 (B0007)	06:57		15:54 (B0006)	06:31	05:11	04:10
	15:23	107	14:35 (B0008)	16:23	26	15:47 (B0003)	17:29	27	16:54 (B0002)	19:38	20:44	21:46
2	08:43		09:25 (B0018)	08:02		14:58 (B0007)	06:54		15:56 (B0006)	06:28	05:09	04:09
	15:24	107	14:35 (B0008)	16:26	27	15:50 (B0003)	17:31	18	16:52 (B0002)	19:40	20:47	21:47
3	08:43		09:25 (B0018)	08:00		15:00 (B0007)	06:51			06:25	05:06	04:08
	15:26	109	14:36 (B0008)	16:28	26	15:53 (B0003)	17:34			19:43	20:49	21:49
4	08:42		09:24 (B0018)	07:58		15:01 (B0007)	06:48			06:23	05:04	04:07
	15:27	108	14:36 (B0008)	16:30	23	15:52 (B0003)	17:36			19:45	20:51	21:50
5	08:42		09:24 (B0018)	07:56		15:04 (B0007)	06:46			06:20	05:01	04:06
	15:28	109	14:36 (B0008)	16:33	15	15:52 (B0003)	17:38			19:47	20:53	21:51
6	08:41		09:24 (B0018)	07:53			06:43			06:17	04:59	04:05
	15:30	108	14:37 (B0008)	16:35			17:41			19:49	20:55	21:53
7	08:40		09:24 (B0018)	07:51			06:40			06:14	04:57	04:04
	15:32	110	14:37 (B0008)	16:38			17:43			19:51	20:58	21:54
8	08:40		09:25 (B0018)	07:49			06:38			06:11	04:54	04:03
	15:33	107	14:37 (B0008)	16:40			17:45			19:54	21:00	21:55
9	08:39		09:25 (B0018)	07:47			06:35			06:09	04:52	04:02
	15:35	105	14:37 (B0008)	16:42			17:47			19:56	21:02	21:56
10	08:38		09:26 (B0018)	07:44			06:32			06:06	04:50	04:01
	15:37	103	14:38 (B0008)	16:45			17:50			19:58	21:04	21:57
11	08:37		09:25 (B0018)	07:42		15:58 (B0006)	06:29			06:03	04:48	04:01
	15:38	103	14:37 (B0008)	16:47	9	16:07 (B0006)	17:52			20:00	21:06	21:58
12	08:36		09:26 (B0018)	07:40		15:54 (B0006)	06:27			06:01	04:45	04:00
	15:40	98	14:37 (B0008)	16:49	16	16:10 (B0006)	17:54			20:02	21:08	21:59
13	08:35		09:26 (B0018)	07:37		15:53 (B0006)	06:24			05:58	04:43	04:00
	15:42	93	14:36 (B0008)	16:52	20	16:13 (B0006)	17:56			20:05	21:10	22:00
14	08:34		09:27 (B0018)	07:35		15:51 (B0006)	06:21			05:55	04:41	03:59
	15:44	87	14:35 (B0008)	16:54	23	16:14 (B0006)	17:59			20:07	21:12	22:01
15	08:32		09:28 (B0018)	07:32		15:51 (B0006)	06:18			05:52	04:39	03:59
	15:46	75	13:56 (B0022)	16:57	25	16:16 (B0006)	18:01			20:09	21:14	22:01
16	08:31		09:29 (B0018)	07:30		15:49 (B0006)	06:16			05:50	04:37	03:59
	15:48	70	13:56 (B0022)	16:59	27	16:16 (B0006)	18:03			20:11	21:17	22:02
17	08:30		09:29 (B0018)	07:27		15:48 (B0006)	06:13			05:47	04:35	03:59
	15:50	60	12:07 (B0012)	17:01	28	16:16 (B0006)	18:05			20:14	21:19	22:03
18	08:28		09:30 (B0018)	07:25		15:49 (B0006)	06:10			05:44	04:33	03:58
	15:52	64	15:06 (B0007)	17:04	29	16:18 (B0006)	18:07			20:16	21:21	22:03
19	08:27		09:32 (B0018)	07:22		15:48 (B0006)	06:07			05:42	04:31	03:58
	15:54	63	15:09 (B0007)	17:06	30	16:18 (B0006)	18:10			20:18	21:23	22:04
20	08:26		09:33 (B0018)	07:20		15:47 (B0006)	06:04			05:39	04:29	03:58
	15:56	59	15:11 (B0007)	17:08	30	16:17 (B0006)	18:12			20:20	21:24	22:04
21	08:24		09:35 (B0018)	07:17		15:48 (B0006)	06:02			05:36	04:27	03:58
	15:58	50	15:12 (B0007)	17:11	30	16:18 (B0006)	18:14			20:22	21:26	22:04
22	08:22		09:43 (B0017)	07:15		15:48 (B0006)	05:59			05:34	04:26	03:59
	16:01	44	15:13 (B0007)	17:13	30	16:18 (B0006)	18:16			20:25	21:28	22:04
23	08:21		09:44 (B0017)	07:12		15:47 (B0006)	05:56			05:31	04:24	03:59
	16:03	45	15:14 (B0007)	17:15	30	16:17 (B0006)	18:18			20:27	21:30	22:05
24	08:19		09:45 (B0017)	07:10		15:48 (B0006)	05:53			05:29	04:22	03:59
	16:05	44	15:15 (B0007)	17:18	32	16:47 (B0002)	18:21			20:29	21:32	22:05
25	08:17		09:46 (B0017)	07:07		15:49 (B0006)	05:50			05:26	04:20	04:00
	16:07	44	15:16 (B0007)	17:20	33	16:49 (B0002)	18:23			20:31	21:34	22:05
26	08:16		09:47 (B0017)	07:04		15:49 (B0006)	05:48			05:23	04:19	04:00
	16:10	42	15:16 (B0007)	17:22	35	16:52 (B0002)	18:25			20:33	21:36	22:04
27	08:14		09:48 (B0017)	07:02		15:50 (B0006)	05:45			05:21	04:17	04:01
	16:12	42	15:17 (B0007)	17:25	35	16:54 (B0002)	18:27			20:36	21:37	22:04
28	08:12		09:49 (B0017)	06:59		15:52 (B0006)	05:42			05:18	04:16	04:01
	16:14	38	15:16 (B0007)	17:27	33	16:56 (B0002)	18:29			20:38	21:39	22:04
29	08:10		09:51 (B0017)				06:39			05:16	04:14	04:02
	16:16	35	15:17 (B0007)				19:32			20:40	21:41	22:04
30	08:08		09:55 (B0017)				06:36			05:13	04:13	04:03
	16:19	28	15:42 (B0003)				19:34			20:42	21:42	22:03
31	08:06		14:57 (B0007)				06:34				04:12	
	16:21	24	15:45 (B0003)				19:36				21:44	
Potential sun hours	228			262			366			429	515	539
Total, worst case	2281			612			45					
Sun reduction	0,19			0,16			0,22					
Oper. time red.	0,99			0,99			0,99					
Wind dir. red.	0,63			0,69			0,69					
Total reduction	0,12			0,11			0,15					
Total, real	263			68			7					

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (913)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:21 100
2	04:04 22:02	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20 104
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	08:19 15:19 105
4	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18 106
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17 110
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:24 15:16 109
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:15 108
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15 109
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14 109
10	04:14 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14 108
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	16:32 (B0006) 16:39 (B0006)	07:34 15:53 23
12	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	16:29 (B0006) 17:27 (B0002)	07:36 15:51 29
13	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	16:26 (B0006) 17:28 (B0002)	07:38 15:49 35
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	16:23 (B0006) 17:28 (B0002)	07:40 15:47 37
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:22 (B0006) 17:26 (B0002)	07:43 15:45 42
16	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	16:21 (B0006) 17:23 (B0002)	07:45 15:43 42
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	16:20 (B0006) 17:19 (B0002)	07:47 15:41 45
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	16:19 (B0006) 17:17 (B0002)	07:49 15:40 44
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:18 (B0006) 16:48 (B0006)	07:52 15:38 45
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:19 (B0006) 16:49 (B0006)	07:54 15:36 44
21	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	16:18 (B0006) 16:48 (B0006)	07:56 15:34 49
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:17 (B0006) 16:48 (B0006)	07:58 15:33 58
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	16:18 (B0006) 16:48 (B0006)	08:00 15:31 63
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:18 (B0006) 16:47 (B0006)	08:02 15:30 64
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	15:19 (B0006) 15:47 (B0006)	08:04 15:28 59
26	04:41 21:31	05:45 20:17	06:51 18:50	06:57 16:30	15:19 (B0006) 15:45 (B0006)	08:06 15:27 70
27	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:27	15:20 (B0006) 15:45 (B0006)	08:08 15:25 75
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	15:21 (B0006) 15:43 (B0006)	08:10 15:24 87
29	04:46 21:25	05:52 20:09	06:57 18:42	07:04 16:22	15:23 (B0006) 15:42 (B0006)	08:12 15:23 93
30	04:48 21:22	05:54 20:06	07:00 18:39	07:06 16:20	15:24 (B0006) 15:39 (B0006)	08:14 15:22 97
31	04:51 21:20	05:56 20:03		07:08 16:18	15:28 (B0006) 15:36 (B0006)	08:44 15:21 106
Potential sun hours	538	474	386	321	241	207
Total, worst case				552	1219	3170
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,63	0,64
Total reduction				0,18	0,11	0,08
Total, real				97	131	264

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÄLEN 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (853)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June
1	08:43	09:34 (B0018)	08:04	15:01 (B0007)	06:57	06:31	05:11	04:10
	15:23	112 14:37 (B0008)	16:23	16 15:17 (B0007)	17:29	19:38	20:44	21:46
2	08:43	09:34 (B0018)	08:02	15:02 (B0007)	06:54	06:28	05:09	04:09
	15:24	112 14:38 (B0008)	16:26	14 15:16 (B0007)	17:31	19:40	20:47	21:47
3	08:43	09:35 (B0018)	08:00	15:05 (B0007)	06:51	06:25	05:06	04:08
	15:26	112 14:39 (B0008)	16:28	10 15:15 (B0007)	17:34	19:43	20:49	21:49
4	08:42	09:35 (B0018)	07:58	15:08 (B0007)	06:48	06:23	05:04	04:07
	15:27	111 14:39 (B0008)	16:30	4 15:12 (B0007)	17:36	19:45	20:51	21:50
5	08:42	09:36 (B0018)	07:56		06:46	06:20	05:01	04:06
	15:28	109 14:39 (B0008)	16:33		17:38	19:47	20:53	21:51
6	08:41	09:36 (B0018)	07:53		06:43	06:17	04:59	04:05
	15:30	107 14:39 (B0008)	16:35		17:41	19:49	20:55	21:53
7	08:40	09:37 (B0018)	07:51		06:40	06:14	04:57	04:04
	15:32	104 14:39 (B0008)	16:38		17:43	19:51	20:58	21:54
8	08:40	09:37 (B0018)	07:49		06:38	06:11	04:54	04:03
	15:33	104 14:40 (B0008)	16:40		17:45	19:54	21:00	21:55
9	08:39	09:38 (B0018)	07:47	15:56 (B0006)	06:35	06:09	04:52	04:02
	15:35	100 14:40 (B0008)	16:42	11 16:07 (B0006)	17:47	19:56	21:02	21:56
10	08:38	09:39 (B0018)	07:44	15:53 (B0006)	06:32	06:06	04:50	04:01
	15:37	96 14:40 (B0008)	16:45	17 16:10 (B0006)	17:50	19:58	21:04	21:57
11	08:37	09:40 (B0018)	07:42	15:52 (B0006)	06:29	06:03	04:48	04:01
	15:38	91 14:39 (B0008)	16:47	20 16:12 (B0006)	17:52	20:00	21:06	21:58
12	08:36	09:41 (B0018)	07:40	15:51 (B0006)	06:27	06:01	04:45	04:00
	15:40	83 14:39 (B0008)	16:49	22 16:13 (B0006)	17:54	20:02	21:08	21:59
13	08:35	09:41 (B0018)	07:37	15:50 (B0006)	06:24	05:58	04:43	04:00
	15:42	74 14:37 (B0008)	16:52	24 16:14 (B0006)	17:56	20:05	21:10	22:00
14	08:34	09:43 (B0018)	07:35	15:49 (B0006)	06:21	05:55	04:41	03:59
	15:44	60 14:02 (B0022)	16:54	26 16:15 (B0006)	17:59	20:07	21:12	22:01
15	08:32	09:45 (B0018)	07:32	15:49 (B0006)	06:18	05:52	04:39	03:59
	15:46	47 13:59 (B0022)	16:57	27 16:16 (B0006)	18:01	20:09	21:14	22:01
16	08:31	09:49 (B0018)	07:30	15:48 (B0006)	06:16	05:50	04:37	03:59
	15:48	27 10:25 (B0017)	16:59	28 16:16 (B0006)	18:03	20:11	21:17	22:02
17	08:30	10:00 (B0017)	07:27	15:48 (B0006)	06:13	05:47	04:35	03:59
	15:50	31 15:08 (B0007)	17:01	28 16:16 (B0006)	18:05	20:14	21:19	22:03
18	08:28	10:00 (B0017)	07:25	15:48 (B0006)	06:10	05:44	04:33	03:58
	15:52	34 15:10 (B0007)	17:04	28 16:16 (B0006)	18:07	20:16	21:21	22:03
19	08:27	10:02 (B0017)	07:22	15:48 (B0006)	06:07	05:42	04:31	03:58
	15:54	35 15:13 (B0007)	17:06	28 16:16 (B0006)	18:10	20:18	21:23	22:04
20	08:26	10:03 (B0017)	07:20	15:48 (B0006)	06:04	05:39	04:29	03:58
	15:56	35 15:14 (B0007)	17:08	27 16:15 (B0006)	18:12	20:20	21:24	22:04
21	08:24	10:04 (B0017)	07:17	15:49 (B0006)	06:02	05:36	04:27	03:58
	15:58	35 15:15 (B0007)	17:11	27 16:16 (B0006)	18:14	20:22	21:26	22:04
22	08:22	10:06 (B0017)	07:15	15:49 (B0006)	05:59	05:34	04:26	03:59
	16:01	33 15:16 (B0007)	17:13	26 16:15 (B0006)	18:16	20:25	21:28	22:04
23	08:21	10:08 (B0017)	07:12	15:50 (B0006)	05:56	05:31	04:24	03:59
	16:03	30 15:17 (B0007)	17:15	26 16:44 (B0002)	18:18	20:27	21:30	22:05
24	08:19	10:12 (B0017)	07:10	15:52 (B0006)	05:53	05:29	04:22	03:59
	16:05	22 15:17 (B0007)	17:18	26 16:47 (B0002)	18:21	20:29	21:32	22:05
25	08:17	14:58 (B0007)	07:07	15:53 (B0006)	05:50	05:26	04:20	04:00
	16:07	20 15:18 (B0007)	17:20	26 16:49 (B0002)	18:23	20:31	21:34	22:05
26	08:16	14:58 (B0007)	07:04	15:55 (B0006)	05:48	05:23	04:19	04:00
	16:10	20 15:18 (B0007)	17:22	24 16:51 (B0002)	18:25	20:33	21:36	22:04
27	08:14	14:58 (B0007)	07:02	15:58 (B0006)	05:45	05:21	04:17	04:01
	16:12	21 15:19 (B0007)	17:25	18 16:53 (B0002)	18:27	20:36	21:37	22:04
28	08:12	14:58 (B0007)	06:59	16:44 (B0002)	05:42	05:18	04:16	04:01
	16:14	20 15:18 (B0007)	17:27	8 16:52 (B0002)	18:29	20:38	21:39	22:04
29	08:10	14:59 (B0007)			06:39	05:16	04:14	04:02
	16:16	19 15:18 (B0007)			19:32	20:40	21:41	22:04
30	08:08	14:59 (B0007)			06:36	05:13	04:13	04:03
	16:19	19 15:18 (B0007)			19:34	20:42	21:42	22:03
31	08:06	15:00 (B0007)			06:34		04:12	
	16:21	18 15:18 (B0007)			19:36		21:44	
Potential sun hours	228		262		366	429	515	539
Total, worst case	1841		511					
Sun reduction	0,19		0,16					
Oper. time red.	0,99		0,99					
Wind dir. red.	0,64		0,69					
Total reduction	0,12		0,11					
Total, real	215		56					

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: PASSAMÅLEN 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (853)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	July	August	September	October	November	December			
1	04:03 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	15:23 (B0006) 15:39 (B0006)	08:16 15:21	09:22 (B0018) 14:21 (B0008)	
2	04:04 22:02	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	15:26 (B0006) 15:37 (B0006)	08:18 15:20	09:22 (B0018) 14:22 (B0008)	
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	15:37 (B0006) 15:19	08:19 15:19	09:21 (B0018) 14:23 (B0008)	
4	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	15:19 15:18	08:21 15:18	09:22 (B0018) 14:24 (B0008)	
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	15:17 15:17	08:23 15:17	09:22 (B0018) 14:25 (B0008)	
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	15:16 15:16	08:24 15:16	09:22 (B0018) 14:25 (B0008)	
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	14:38 (B0007) 14:43 (B0007)	08:26 15:15	09:23 (B0018) 14:26 (B0008)	
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	14:34 (B0007) 14:45 (B0007)	08:28 15:15	09:23 (B0018) 14:27 (B0008)	
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	14:33 (B0007) 14:47 (B0007)	08:29 15:14	09:23 (B0018) 14:27 (B0008)	
10	04:14 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	14:32 (B0007) 14:48 (B0007)	08:30 15:14	09:24 (B0018) 14:28 (B0008)	
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	14:31 (B0007) 14:49 (B0007)	08:32 15:13	09:24 (B0018) 14:27 (B0008)	
12	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	07:36 15:51	14:31 (B0007) 14:50 (B0007)	08:33 15:13	09:25 (B0018) 14:27 (B0008)	
13	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	17:19 (B0002) 17:22 (B0002)	07:38 15:49	14:30 (B0007) 15:13	08:34 15:13	09:25 (B0018) 14:26 (B0008)
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	17:15 (B0002) 17:24 (B0002)	07:40 15:47	14:31 (B0007) 14:51 (B0007)	08:35 15:13	09:25 (B0018) 14:26 (B0008)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	16:29 (B0006) 17:26 (B0002)	07:43 15:45	14:30 (B0007) 14:51 (B0007)	08:36 15:12	09:25 (B0018) 14:25 (B0008)
16	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	16:26 (B0006) 17:23 (B0002)	07:45 15:43	14:31 (B0007) 14:51 (B0007)	08:37 15:12	09:26 (B0018) 14:25 (B0008)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	16:23 (B0006) 17:19 (B0002)	07:47 15:41	14:31 (B0007) 14:51 (B0007)	08:38 15:12	09:26 (B0018) 14:25 (B0008)
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	16:22 (B0006) 17:17 (B0002)	07:49 15:40	09:46 (B0017) 14:51 (B0007)	08:39 15:13	09:27 (B0018) 14:25 (B0008)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:21 (B0006) 17:14 (B0002)	07:52 15:38	09:42 (B0017) 14:51 (B0007)	08:40 15:13	09:28 (B0018) 14:26 (B0008)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:20 (B0006) 16:46 (B0006)	07:54 15:36	09:41 (B0017) 14:51 (B0007)	08:41 15:13	09:28 (B0018) 14:26 (B0008)
21	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	16:19 (B0006) 16:46 (B0006)	07:56 15:34	09:39 (B0017) 14:50 (B0007)	08:41 15:13	09:28 (B0018) 14:26 (B0008)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	16:18 (B0006) 16:46 (B0006)	07:58 15:33	09:39 (B0017) 14:50 (B0007)	08:42 15:14	09:29 (B0018) 14:27 (B0008)
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	16:18 (B0006) 16:46 (B0006)	08:00 15:31	09:38 (B0017) 14:49 (B0007)	08:42 15:14	09:29 (B0018) 14:27 (B0008)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	16:18 (B0006) 16:46 (B0006)	08:02 15:30	09:38 (B0017) 14:49 (B0007)	08:43 15:15	09:30 (B0018) 14:27 (B0008)
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	15:18 (B0006) 15:46 (B0006)	08:04 15:28	09:38 (B0017) 14:47 (B0007)	08:43 15:16	09:31 (B0018) 14:29 (B0008)
26	04:41 21:31	05:45 20:17	06:51 18:50	06:57 16:30	15:18 (B0006) 15:45 (B0006)	08:06 15:27	09:37 (B0017) 10:03 (B0017)	08:43 15:16	09:31 (B0018) 14:30 (B0008)
27	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:27	15:19 (B0006) 15:45 (B0006)	08:08 15:25	09:24 (B0018) 13:38 (B0022)	08:44 15:17	09:32 (B0018) 14:31 (B0008)
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	15:19 (B0006) 15:44 (B0006)	08:10 15:24	09:23 (B0018) 13:42 (B0022)	08:44 15:18	09:32 (B0018) 14:32 (B0008)
29	04:46 21:25	05:52 20:09	06:57 18:42	07:04 16:22	15:20 (B0006) 15:44 (B0006)	08:12 15:23	09:23 (B0018) 14:18 (B0008)	08:44 15:19	09:32 (B0018) 14:32 (B0008)
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	15:20 (B0006) 15:42 (B0006)	08:14 15:22	09:22 (B0018) 14:20 (B0008)	08:44 15:20	09:33 (B0018) 14:34 (B0008)
31	04:51 21:20	05:56 20:03	07:08 16:18	07:08 15:41	15:22 (B0006) 15:41 (B0006)	08:14 15:22	08:44 15:21	09:33 (B0018) 14:35 (B0008)	
Potential sun hours	538	474	386	321	241	207			
Total, worst case				447	757			3352	
Sun reduction				0,26	0,17			0,13	
Oper. time red.				0,99	0,99			0,99	
Wind dir. red.				0,69	0,65			0,64	
Total reduction				0,18	0,11			0,08	
Total, real				79	83			277	

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SKÅLJARYD 1:5>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (900)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	06:56 17:29	06:31 19:38	05:11 20:44	05:55 (B0024) 21:45 21
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:09 20:46	05:55 (B0024) 21:47 21
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:43	05:06 20:49	05:56 (B0024) 21:48 21
4	08:42 15:27	07:57 16:31	06:48 17:36	06:23 19:45	05:04 20:51	05:55 (B0024) 21:50 23
5	08:41 15:29	07:55 16:33	06:46 17:38	06:20 19:47	05:01 20:53	05:56 (B0024) 21:51 23
6	08:41 15:30	07:53 16:40	06:43 17:41	06:17 19:49	04:59 20:55	05:57 (B0024) 21:52 23
7	08:40 15:32	07:51 16:38	06:40 17:43	06:14 19:51	04:57 20:57	05:58 (B0024) 21:53 23
8	08:39 15:33	07:49 16:40	06:38 17:45	06:12 19:54	04:55 20:59	06:00 (B0024) 21:55 24
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	04:52 21:02	06:04 (B0024) 21:56 24
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	06:06 (B0024) 21:57 23
11	08:37 15:39	07:42 16:47	06:29 17:52	06:03 20:00	04:48 21:06	20:29 (B0005) 21:58 24
12	08:36 15:40	07:39 16:50	06:27 17:54	06:01 20:02	04:46 21:08	20:29 (B0005) 21:59 24
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	04:43 21:10	20:29 (B0005) 22:00 24
14	08:33 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:41 21:12	20:29 (B0005) 22:00 24
15	08:32 15:46	07:32 16:57	06:18 18:01	05:52 20:09	04:39 21:14	20:29 (B0005) 22:01 24
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:16	20:30 (B0005) 22:02 25
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	04:35 21:18	20:30 (B0005) 22:02 24
18	08:28 15:52	07:25 17:04	06:10 18:07	05:44 20:16	04:33 21:20	20:33 (B0005) 22:03 24
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	04:31 21:22	20:39 (B0005) 22:03 24
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	04:29 21:24	20:39 (B0005) 22:04 24
21	08:24 15:59	07:17 17:11	06:02 18:14	05:36 20:22	04:28 21:26	22:04 24
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	04:26 21:28	03:59 24
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	04:24 21:30	03:59 24
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:22 21:32	03:59 24
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	04:21 21:34	04:55 (B0023) 22:04 24
26	08:15 16:10	07:04 17:22	05:48 18:25	05:24 20:33	04:19 21:35	04:54 (B0023) 22:04 25
27	08:13 16:12	07:02 17:25	05:45 18:27	05:21 20:35	04:18 21:37	04:53 (B0023) 22:04 24
28	08:12 16:14	06:59 17:27	05:42 18:29	05:19 20:38	04:16 21:39	04:51 (B0023) 22:04 24
29	08:10 16:17	06:57 19:32	05:40 20:40	05:17 20:42	04:15 21:40	04:50 (B0023) 22:03 25
30	08:08 16:19	06:56 19:34	05:39 20:42	05:16 20:44	04:14 21:42	04:49 (B0023) 22:03 24
31	08:06 16:21	06:54 19:36	05:37 20:44	05:14 20:46	04:13 21:44	04:48 (B0023) 22:03 19
Potential sun hours	228	263	366	429	515	538
Total, worst case				175	285	709
Sun reduction				0,42	0,53	0,43
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,67	0,66	0,69
Total reduction				0,28	0,35	0,29
Total, real				49	99	207

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SKÅLJARYD 1:5>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (900)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

July		August		September		October	November	December
1	04:04	04:51 (B0023)	04:53	20:39 (B0005)	05:58	07:02	07:10	08:16
22:03	24	05:15 (B0023)	21:18	3	20:42 (B0005)	20:00	18:36	16:15
2	04:05	04:52 (B0023)	04:55	20:39 (B0005)	06:00	07:04	07:13	08:17
22:02	24	05:16 (B0023)	21:16	1	20:40 (B0005)	19:57	18:34	16:13
3	04:06	04:51 (B0023)	04:57		06:02	07:06	07:15	08:19
22:01	24	05:15 (B0023)	21:14		19:55	18:31	16:11	15:19
4	04:07	04:52 (B0023)	04:59	06:12 (B0024)	06:05	07:08	07:17	08:21
22:01	23	05:15 (B0023)	21:11	7	06:19 (B0024)	19:52	18:28	16:08
5	04:08	04:52 (B0023)	05:01	06:10 (B0024)	06:07	07:10	07:20	08:23
22:00	23	05:15 (B0023)	21:09	11	06:21 (B0024)	19:49	18:25	16:06
6	04:09	04:52 (B0023)	05:03	06:07 (B0024)	06:09	07:12	07:22	08:24
21:59	23	05:15 (B0023)	21:07	15	06:22 (B0024)	19:46	18:23	16:04
7	04:10	04:52 (B0023)	05:05	06:06 (B0024)	06:11	07:15	07:24	08:26
21:58	23	05:15 (B0023)	21:04	17	06:23 (B0024)	19:44	18:20	16:02
8	04:11	04:54 (B0023)	05:07	06:05 (B0024)	06:13	07:17	07:27	08:27
21:57	22	05:16 (B0023)	21:02	19	06:24 (B0024)	19:41	18:17	15:59
9	04:12	04:54 (B0023)	05:09	06:04 (B0024)	06:15	07:19	07:29	08:29
21:56	22	05:16 (B0023)	21:00	21	06:25 (B0024)	19:38	18:14	15:57
10	04:14	04:54 (B0023)	05:11	06:04 (B0024)	06:17	07:21	07:31	08:30
21:55	22	05:16 (B0023)	20:57	22	06:26 (B0024)	19:35	18:12	15:55
11	04:15	04:54 (B0023)	05:14	06:03 (B0024)	06:19	07:23	07:33	08:31
21:54	21	05:15 (B0023)	20:55	23	06:26 (B0024)	19:33	18:09	15:53
12	04:17	04:55 (B0023)	05:16	06:03 (B0024)	06:21	07:25	07:36	08:33
21:53	20	05:15 (B0023)	20:53	23	06:26 (B0024)	19:30	18:06	15:51
13	04:18	04:57 (B0023)	05:18	06:03 (B0024)	06:24	07:28	07:38	08:34
21:52	18	05:15 (B0023)	20:50	23	06:26 (B0024)	19:27	18:04	15:49
14	04:20	04:58 (B0023)	05:20	06:03 (B0024)	06:26	07:30	07:40	08:35
21:50	16	05:14 (B0023)	20:48	23	06:26 (B0024)	19:24	18:01	15:47
15	04:21	05:00 (B0023)	05:22	06:03 (B0024)	06:28	07:32	07:42	08:36
21:49	14	05:14 (B0023)	20:45	23	06:26 (B0024)	19:21	17:58	15:45
16	04:23	05:01 (B0023)	05:24	06:03 (B0024)	06:30	07:34	07:45	08:37
21:47	12	05:13 (B0023)	20:43	22	06:25 (B0024)	19:19	17:56	15:43
17	04:24	05:03 (B0023)	05:26	06:04 (B0024)	06:32	07:36	07:47	08:38
21:46	10	05:13 (B0023)	20:40	20	06:24 (B0024)	19:16	17:53	15:41
18	04:26	05:04 (B0023)	05:28	06:04 (B0024)	06:34	07:39	07:49	08:39
21:44	7	05:11 (B0023)	20:37	19	06:23 (B0024)	19:13	17:50	15:40
19	04:28	05:06 (B0023)	05:31	06:05 (B0024)	06:36	07:41	07:51	08:40
21:43	4	05:10 (B0023)	20:35	17	06:22 (B0024)	19:10	17:48	15:38
20	04:30		05:33	06:06 (B0024)	06:38	07:43	07:53	08:40
21:41			20:32	15	06:21 (B0024)	19:07	17:45	15:36
21	04:31		05:35	06:09 (B0024)	06:40	07:45	07:56	08:41
21:39			20:30	9	06:18 (B0024)	19:04	17:43	15:35
22	04:33		05:37		06:42	07:48	07:58	08:42
21:38			20:27		19:02	17:40	15:33	15:14
23	04:35		05:39		06:45	07:50	08:00	08:42
21:36			20:24		18:59	17:37	15:31	15:15
24	04:37		05:41		06:47	07:52	08:02	08:43
21:34			20:22		18:56	17:35	15:30	15:15
25	04:39	20:44 (B0005)	05:43		06:49	06:54	08:04	08:43
21:32	4	20:48 (B0005)	20:19		18:53	16:32	15:28	15:16
26	04:41	20:42 (B0005)	05:45		06:51	06:57	08:06	08:43
21:30	8	20:50 (B0005)	20:16		18:50	16:30	15:27	15:17
27	04:43	20:41 (B0005)	05:48		06:53	06:59	08:08	08:43
21:28	10	20:51 (B0005)	20:14		18:48	16:27	15:26	15:18
28	04:45	20:41 (B0005)	05:50		06:55	07:01	08:10	08:43
21:26	9	20:50 (B0005)	20:11		18:45	16:25	15:24	15:18
29	04:47	20:40 (B0005)	05:52		06:57	07:04	08:12	08:43
21:24	8	20:48 (B0005)	20:08		18:42	16:22	15:23	15:19
30	04:49	20:39 (B0005)	05:54		06:59	07:06	08:14	08:43
21:22	6	20:45 (B0005)	20:06		18:39	16:20	15:22	15:21
31	04:51	20:39 (B0005)	05:56			07:08		08:43
21:20	5	20:44 (B0005)	20:03			16:18		15:22
Potential sun hours	538		474		386	321	241	207
Total, worst case	402		333					
Sun reduction	0,38		0,35					
Oper. time red.	0,99		0,99					
Wind dir. red.	0,68		0,67					
Total reduction	0,26		0,23					
Total, real	104		78					

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SPINKARP 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (901)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June
1	08:43	13:35 (B0017)	08:04	15:28 (B0022)	06:56	06:31	05:11	04:10
	15:23	31 14:21 (B0025)	16:23	3 15:31 (B0022)	17:29	19:38	20:44	21:46
2	08:43	13:36 (B0017)	08:02		06:54	06:28	05:08	04:09
	15:24	30 14:21 (B0025)	16:26		17:31	19:40	20:47	21:47
3	08:43	13:37 (B0017)	08:00		06:51	06:25	05:06	04:08
	15:25	28 14:21 (B0025)	16:28		17:34	19:43	20:49	21:48
4	08:42	13:38 (B0017)	07:58		06:48	06:22	05:04	04:07
	15:27	27 14:21 (B0025)	16:30		17:36	19:45	20:51	21:50
5	08:42	13:39 (B0017)	07:55		06:46	06:20	05:01	04:06
	15:28	24 14:21 (B0025)	16:33		17:38	19:47	20:53	21:51
6	08:41	13:40 (B0017)	07:53		06:43	06:17	04:59	04:05
	15:30	22 14:21 (B0025)	16:35		17:40	19:49	20:55	21:53
7	08:40	13:41 (B0017)	07:51		06:40	06:14	04:57	04:04
	15:31	18 14:20 (B0025)	16:37		17:43	19:51	20:57	21:54
8	08:40	13:43 (B0017)	07:49		06:38	06:11	04:54	04:03
	15:33	11 14:19 (B0025)	16:40		17:45	19:54	21:00	21:55
9	08:39	13:45 (B0017)	07:47		06:35	06:09	04:52	04:02
	15:35	8 14:51 (B0012)	16:42		17:47	19:56	21:02	21:56
10	08:38	14:48 (B0012)	07:44		06:32	06:06	04:50	04:01
	15:37	5 14:53 (B0012)	16:45		17:50	19:58	21:04	21:57
11	08:37	14:47 (B0012)	07:42		06:29	06:03	04:48	04:01
	15:38	8 14:55 (B0012)	16:47		17:52	20:00	21:06	21:58
12	08:36	14:47 (B0012)	07:40		06:27	06:00	04:45	04:00
	15:40	10 14:57 (B0012)	16:49		17:54	20:02	21:08	21:59
13	08:35	14:46 (B0012)	07:37		06:24	05:58	04:43	04:00
	15:42	13 14:59 (B0012)	16:52		17:56	20:05	21:10	22:00
14	08:34	14:46 (B0012)	07:35		06:21	05:55	04:41	03:59
	15:44	14 15:00 (B0012)	16:54		17:58	20:07	21:12	22:01
15	08:32	14:45 (B0012)	07:32		06:18	05:52	04:39	03:59
	15:46	16 15:01 (B0012)	16:56		18:01	20:09	21:14	22:01
16	08:31	14:46 (B0012)	07:30		06:15	05:50	04:37	03:59
	15:48	16 15:02 (B0012)	16:59		18:03	20:11	21:16	22:02
17	08:30	14:46 (B0012)	07:27		06:13	05:47	04:35	03:58
	15:50	16 15:02 (B0012)	17:01		18:05	20:13	21:18	22:03
18	08:28	14:46 (B0012)	07:25		06:10	05:44	04:33	03:58
	15:52	17 15:03 (B0012)	17:03		18:07	20:16	21:20	22:03
19	08:27	14:45 (B0012)	07:22	16:31 (B0006)	06:07	05:42	04:31	03:58
	15:54	18 15:03 (B0012)	17:06	3 16:34 (B0006)	18:10	20:18	21:22	22:04
20	08:25	14:47 (B0012)	07:20	16:30 (B0006)	06:04	05:39	04:29	03:58
	15:56	17 15:04 (B0012)	17:08	6 16:36 (B0006)	18:12	20:20	21:24	22:04
21	08:24	14:47 (B0012)	07:17	16:30 (B0006)	06:02	05:36	04:27	03:58
	15:58	17 15:04 (B0012)	17:11	9 16:39 (B0006)	18:14	20:22	21:26	22:04
22	08:22	14:47 (B0012)	07:15	16:30 (B0006)	05:59	05:34	04:26	03:59
	16:00	17 15:04 (B0012)	17:13	12 16:42 (B0006)	18:16	20:24	21:28	22:04
23	08:21	14:48 (B0012)	07:12	16:30 (B0006)	05:56	05:31	04:24	03:59
	16:03	17 15:23 (B0022)	17:15	12 16:42 (B0006)	18:18	20:27	21:30	22:04
24	08:19	14:49 (B0012)	07:10	16:32 (B0006)	05:53	05:29	04:22	03:59
	16:05	19 15:26 (B0022)	17:18	10 16:42 (B0006)	18:21	20:29	21:32	22:05
25	08:17	14:50 (B0012)	07:07	16:33 (B0006)	05:50	05:26	04:20	03:59
	16:07	21 15:29 (B0022)	17:20	7 16:40 (B0006)	18:23	20:31	21:34	22:05
26	08:15	14:51 (B0012)	07:04		05:48	05:23	04:19	04:00
	16:09	21 15:31 (B0022)	17:22		18:25	20:33	21:36	22:04
27	08:14	14:53 (B0012)	07:02		05:45	05:21	04:17	04:00
	16:12	22 15:34 (B0022)	17:24		18:27	20:36	21:37	22:04
28	08:12	14:55 (B0012)	06:59		05:42	05:18	04:16	04:01
	16:14	18 15:35 (B0022)	17:27		18:29	20:38	21:39	22:04
29	08:10	15:23 (B0022)			06:39	05:16	04:14	04:02
	16:16	12 15:35 (B0022)			19:32	20:40	21:41	22:04
30	08:08	15:24 (B0022)			06:36	05:13	04:13	04:02
	16:19	11 15:35 (B0022)			19:34	20:42	21:42	22:03
31	08:06	15:26 (B0022)			06:34		04:11	
	16:21	8 15:34 (B0022)			19:36		21:44	
Potential sun hours	228		262		366	429	515	539
Total, worst case	532		62					
Sun reduction	0,19		0,16					
Oper. time red.	0,99		0,99					
Wind dir. red.	0,69		0,69					
Total reduction	0,13		0,11					
Total, real	67		7					

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SPINKARP 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (901)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:21 8 14:37 (B0012)
2	04:04 22:02	04:54 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20 5 14:35 (B0012)
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19 8 14:34 (B0012)
4	04:06 22:01	04:59 21:12	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18 9 13:36 (B0017)
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17 18 14:05 (B0025)
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	07:22 16:04	08:24 15:16 21 14:07 (B0025)
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:01	08:26 15:15 25 14:08 (B0025)
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15 26 14:08 (B0025)
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14 28 14:09 (B0025)
10	04:13 21:55	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55 4	08:30 15:14 30 14:11 (B0025)
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53 9	08:32 15:13 30 14:11 (B0025)
12	04:16 21:53	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51 11	08:33 15:13 32 14:12 (B0025)
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:04	07:38 15:49 12	08:34 15:13 32 14:12 (B0025)
14	04:19 21:50	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47 19	08:35 15:12 33 14:13 (B0025)
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45 22	08:36 15:12 33 14:13 (B0025)
16	04:22 21:48	05:24 20:43	06:30 19:19	07:34 17:55	07:45 15:43 21	08:37 15:12 34 14:14 (B0025)
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53 8	07:47 15:41 21	08:38 15:12 34 14:14 (B0025)
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50 11	07:49 15:39 19	08:39 15:12 34 14:15 (B0025)
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48 13	07:51 15:38 17	08:40 15:13 35 14:16 (B0025)
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45 11	07:54 15:36 17	08:41 15:13 34 14:16 (B0025)
21	04:31 21:40	05:35 20:30	06:40 19:04	07:45 17:42 9	07:56 15:34 17	08:41 15:13 34 14:17 (B0025)
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40 6	07:58 15:33 17	08:42 15:14 34 14:17 (B0025)
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37 2	08:00 15:31 17	08:42 15:14 34 14:17 (B0025)
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30 17	08:43 15:15 35 14:18 (B0025)
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28 16	08:43 15:16 34 14:19 (B0025)
26	04:40 21:30	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27 16	08:43 15:16 34 14:19 (B0025)
27	04:42 21:28	05:47 20:14	06:53 18:48	06:59 16:27	08:08 15:25 16	08:44 15:17 34 14:20 (B0025)
28	04:44 21:26	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24 14	08:44 15:18 34 14:19 (B0025)
29	04:46 21:24	05:52 20:08	06:57 18:42	07:04 16:22	08:12 15:23 13	08:44 15:19 33 14:20 (B0025)
30	04:48 21:22	05:54 20:06	06:59 18:39	07:06 16:20	08:14 15:22 10	08:44 15:20 33 14:20 (B0025)
31	04:50 21:20	05:56 20:03		07:08 16:18		08:43 15:21 32 14:21 (B0025)
Potential sun hours	538	474	386	321	241	207
Total, worst case				60	325	880
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,69	0,69
Total reduction				0,18	0,12	0,09
Total, real				11	38	79

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: STENSGÖL 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (879)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January	February	March	April	May	June	July	August	September	October	November	December
1	08:44 15:23	08:04 16:24	06:57 17:29	06:31 19:39	05:11 19:39	04:11 20:45	04:04 21:19	04:53 21:19	05:58 20:01	07:02 18:37	07:11 16:15	07:52 (B0001) 15:21
2	08:43 15:24	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:09 21:47	04:05 22:03	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	07:51 (B0001) 15:20
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:06 20:49	04:08 21:49	04:05 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:16 16:11	07:52 (B0001) 15:19
4	08:43 15:27	07:58 16:31	08:30 (B0001) 17:36	06:49 19:45	06:23 20:51	05:04 21:50	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	07:52 (B0001) 15:18
5	08:42 15:29	07:56 16:33	08:27 (B0001) 17:39	06:46 19:47	06:20 20:54	05:02 21:52	04:06 22:01	05:01 21:10	06:07 19:50	07:11 18:26	07:20 16:06	07:55 (B0001) 15:17
6	08:41 15:30	07:54 16:35	08:25 (B0001) 17:41	06:43 19:50	06:17 20:56	04:59 21:53	04:09 22:00	05:03 21:07	06:09 19:47	07:13 18:23	07:23 16:04	07:58 (B0001) 15:16
7	08:41 15:32	07:51 16:38	08:22 (B0001) 17:43	06:41 19:52	06:15 20:58	04:57 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:00 (B0001) 15:16
8	08:40 15:33	07:49 16:40	08:22 (B0001) 17:45	06:38 19:54	06:12 21:00	04:55 21:55	04:11 21:58	05:07 21:03	06:13 19:41	07:17 18:17	07:27 16:00	08:03 (B0001) 15:15
9	08:39 15:35	07:47 16:43	08:22 (B0001) 17:48	06:35 19:56	06:09 21:02	04:52 21:56	04:12 21:57	05:09 21:00	06:15 19:39	07:19 18:15	07:29 15:57	08:29 15:14
10	08:38 15:37	07:45 16:45	08:23 (B0001) 17:50	06:32 19:58	06:06 21:04	04:50 21:58	04:14 21:56	05:12 20:58	06:18 19:36	07:21 18:12	07:32 15:55	08:31 15:14
11	08:37 15:39	07:42 16:47	08:23 (B0001) 17:52	06:30 20:01	06:04 21:06	04:48 21:58	04:15 21:55	05:14 20:56	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:40	07:40 16:50	08:24 (B0001) 17:54	06:27 20:03	06:01 21:09	04:46 21:59	04:17 21:54	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:13
13	08:35 15:42	07:38 16:52	08:25 (B0001) 17:57	06:24 20:05	05:58 21:11	04:44 22:00	04:18 21:52	05:18 20:51	06:24 19:27	07:28 18:04	07:39 15:49	08:35 15:13
14	08:34 15:44	07:35 16:54	08:29 (B0001) 18:01	06:21 20:07	05:55 21:13	04:41 22:01	04:20 21:51	05:20 20:48	06:26 19:25	07:30 18:01	07:41 15:47	08:36 15:13
15	08:33 15:46	07:33 16:57	08:31 (B0001) 18:03	06:19 20:09	05:53 21:15	04:39 22:02	04:21 21:50	05:22 20:46	06:28 19:22	07:32 17:59	07:43 15:45	08:37 15:13
16	08:32 15:48	07:30 16:59	08:32 (B0001) 18:03	06:16 20:12	05:50 21:17	04:37 22:02	04:23 21:48	05:24 20:43	06:30 19:19	07:35 17:56	07:45 15:43	08:38 15:13
17	08:30 15:50	07:28 17:02	08:30 (B0001) 18:06	06:13 20:14	05:47 21:19	04:35 22:03	04:24 21:47	05:26 20:41	06:32 19:16	07:37 17:53	07:47 15:42	08:39 15:13
18	08:29 15:52	07:25 17:04	08:29 (B0001) 18:08	06:10 20:16	05:45 21:21	04:33 22:04	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:50 15:40	08:40 15:13
19	08:27 15:54	07:23 17:06	08:27 (B0001) 18:10	06:08 20:18	05:42 21:23	04:31 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	08:26 (B0001) 18:12	06:05 20:20	05:39 21:25	04:30 22:04	04:30 21:42	05:33 20:33	06:39 19:08	07:44 17:45	07:54 15:36	08:41 15:13
21	08:24 15:59	07:18 17:11	08:24 (B0001) 18:14	06:02 20:23	05:37 21:27	04:28 22:05	04:31 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:42 15:14
22	08:23 16:01	07:15 17:13	08:23 (B0001) 18:17	05:59 20:25	05:34 21:29	04:26 22:05	04:33 21:38	05:37 20:28	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:13 17:16	08:21 (B0001) 18:19	05:56 20:27	05:31 21:31	04:24 22:05	04:35 21:37	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:31	08:43 15:15
24	08:19 16:05	07:10 17:18	08:19 (B0001) 18:21	05:54 20:29	05:29 21:32	04:22 22:05	04:37 21:35	05:41 20:22	06:47 18:56	07:53 17:35	08:03 15:30	08:43 15:15
25	08:18 16:08	07:07 17:20	08:18 (B0001) 18:23	05:51 20:32	05:26 21:34	04:21 22:05	04:39 21:33	05:44 20:20	06:49 18:54	06:55 16:33	08:05 15:28	08:44 15:16
26	08:16 16:10	07:05 17:23	08:16 (B0001) 18:25	05:48 20:34	05:24 21:36	04:19 22:05	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:07 15:27	08:44 15:17
27	08:14 16:12	07:02 17:25	08:14 (B0001) 18:28	05:45 20:36	05:21 21:38	04:18 22:05	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:09 15:26	08:44 15:18
28	08:12 16:14	06:59 17:27	08:12 (B0001) 18:30	05:42 20:38	05:19 21:39	04:16 22:04	04:45 21:27	05:50 20:12	07:57 (B0001) 18:45	08:02 (B0001) 16:25	08:11 15:24	08:44 15:18
29	08:10 16:17	06:40 17:32	08:10 (B0001) 18:40	05:40 20:40	05:16 21:41	04:15 22:04	04:47 21:25	05:52 20:09	06:58 18:42	07:04 16:23	08:13 15:23	08:44 15:19
30	08:08 16:19	06:37 17:43	08:08 (B0001) 18:43	06:37 20:43	05:14 21:43	04:03 22:04	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21	06:34 17:48	08:06 (B0001) 18:46	06:34 20:46	05:12 21:44	04:02 22:05	04:51 21:21	05:56 20:03	07:09 18:18	07:09 16:18	08:15 15:22	08:44 15:22
Potential sun hours	228	262	366	429	515	539	538	474	386	321	241	207
Total, worst case		114								41		
Sun reduction		0,16								0,26		
Oper. time red.		0,99								0,99		
Wind dir. red.		0,58								0,58		
Total reduction		0,09								0,15		
Total, real		11								6		
											77	
											0,17	
											0,99	
											0,58	
											0,10	
											8	

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: STORA HESTER 1:7>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (867)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:23	06:56 17:29	06:31 19:38	05:11 20:44	04:10 21:46	04:03 22:03	04:52 21:18	05:58 20:00	07:02 18:36	07:11 16:15	08:16 15:20
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	05:08 20:47	04:09 21:47	04:04 22:02	04:54 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:19
3	08:43 15:25	08:00 16:28	06:51 17:34	06:25 19:43	06:51 (1) 20:51	05:06 20:49	04:08 21:49	04:56 22:02	06:02 19:55	07:06 18:31	07:15 16:10	08:20 15:18
4	08:42 15:27	07:58 16:30	06:48 17:36	06:22 19:45	06:49 (1) 20:51	05:04 21:50	04:07 22:01	04:59 21:12	06:04 19:52	06:37 (1) 18:28	07:08 16:08	08:21 15:17
5	08:42 15:28	07:56 16:33	06:46 17:38	06:20 19:47	06:46 (1) 20:53	05:01 21:51	04:05 22:00	05:01 21:09	06:07 19:49	06:37 (1) 18:25	07:10 16:06	08:23 15:17
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	06:43 (1) 20:55	04:59 21:53	04:04 22:00	05:03 21:07	06:09 19:47	06:39 (1) 18:23	4 07:41 (5) 16:04	07:22 15:16
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	06:40 (1) 20:58	04:56 21:54	04:04 21:59	05:05 21:05	06:11 19:44	06:41 (1) 18:20	5 07:47 (5) 16:01	07:24 15:15
8	08:40 15:33	07:49 16:40	06:38 17:45	06:11 19:54	07:04 (5) 20:58	06:40 (1) 21:55	04:03 21:58	05:07 21:02	06:13 19:41	06:43 (1) 18:17	3 07:47 (5) 15:59	07:27 15:15
9	08:39 15:35	07:47 16:42	06:35 17:47	06:09 19:56	07:09 (5) 20:56	04:52 21:56	04:12 21:57	05:09 21:00	06:15 19:38	06:45 (1) 18:14	1 07:48 (5) 15:57	07:29 15:14
10	08:38 15:36	07:44 16:44	06:32 17:50	06:06 19:58	06:06 20:03	04:50 21:04	04:01 21:57	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:13
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	06:03 20:06	04:47 21:06	04:01 21:58	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	08:36 15:40	07:40 16:49	06:27 17:54	06:00 20:02	06:00 20:05	04:45 21:08	04:00 21:59	05:15 20:53	06:21 19:30	07:25 18:06	07:36 15:51	08:33 15:13
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:05	06:00 20:05	04:43 21:10	04:00 22:00	05:18 20:50	06:23 19:27	06:59 (4) 18:03	07:28 15:49	08:34 15:12
14	08:34 15:44	07:35 16:54	06:21 17:58	05:55 20:07	06:06 20:07	04:41 21:12	03:59 22:01	05:20 20:48	06:26 19:24	06:56 (4) 18:01	07:30 15:47	08:35 15:12
15	08:33 15:46	07:32 16:56	06:18 18:01	05:52 20:09	06:06 20:09	04:39 21:14	03:59 22:01	05:22 20:45	06:28 19:21	06:57 (4) 17:58	07:32 15:45	08:36 15:12
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	06:14 (2) 20:11	04:37 21:17	03:58 22:02	05:24 20:43	06:30 19:19	06:59 (4) 17:55	07:34 15:43	08:38 15:12
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	06:15 (2) 20:13	04:35 21:19	03:58 22:03	05:26 20:40	06:32 19:16	07:01 (4) 17:53	07:37 15:41	08:38 15:12
18	08:29 15:52	07:25 17:03	06:10 18:07	05:44 20:16	06:11 (2) 20:16	04:33 21:21	03:58 22:03	05:28 20:38	06:34 19:13	07:03 (4) 17:50	07:39 15:39	08:39 15:12
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	06:09 (2) 20:18	04:31 21:23	03:58 22:04	05:30 20:35	06:36 19:10	07:05 (4) 17:48	07:52 15:38	08:40 15:13
20	08:26 15:56	07:20 17:08	06:04 18:12	05:39 20:20	06:14 (2) 20:20	04:29 21:25	03:58 22:04	05:32 20:32	06:38 19:07	07:41 17:45	07:54 15:36	08:41 15:13
21	08:24 15:58	07:17 17:10	06:02 18:14	05:36 20:22	06:06 (2) 20:22	04:27 21:26	03:58 22:04	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	08:41 15:13
22	08:22 16:00	07:15 17:13	05:59 18:16	05:34 20:25	06:10 (2) 20:25	04:25 21:28	03:58 22:04	05:37 20:27	06:10 (2) 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	06:15 (2) 20:27	04:24 21:30	03:59 22:05	05:39 20:25	06:11 (2) 18:59	07:40 17:37	08:00 15:31	08:43 15:14
24	08:19 16:05	07:10 17:17	05:53 18:21	05:28 20:29	06:16 (4) 20:29	04:22 21:32	03:59 22:05	05:41 20:22	06:13 (2) 18:56	07:35 17:35	08:02 15:29	08:43 15:15
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	06:17 (4) 20:31	04:20 21:34	03:59 22:05	05:43 20:19	06:15 (2) 18:53	06:49 17:32	08:04 15:28	08:43 15:15
26	08:16 16:09	07:04 17:22	05:48 18:25	05:23 20:33	06:14 (4) 20:33	04:19 21:36	04:00 22:05	05:45 20:17	06:17 (2) 18:50	06:57 17:30	08:06 15:27	08:44 15:16
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:36	06:18 (4) 20:36	04:17 21:37	04:00 22:04	05:47 20:14	06:18 (2) 18:48	06:59 17:27	08:08 15:25	08:44 15:17
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	06:17 (4) 20:38	04:16 21:39	04:01 22:04	05:50 20:11	06:55 18:45	07:01 17:25	08:10 15:24	08:44 15:18
29	08:10 16:16	06:39 17:32	05:16 19:32	05:16 20:40	07:05 (4) 20:40	04:14 21:41	04:02 22:04	05:52 20:08	06:57 18:42	07:04 17:22	08:12 15:23	08:44 15:19
30	08:08 16:19	06:36 17:34	05:13 19:34	05:13 20:42	07:14 (4) 20:42	04:13 21:42	04:02 22:03	05:54 20:06	06:59 18:39	07:06 17:20	08:14 15:22	08:44 15:20
31	08:06 16:21	06:34 17:36	05:13 19:36	05:13 20:42	07:11 (4) 20:42	04:11 21:44	04:00 22:03	05:56 20:03	06:59 18:39	07:08 17:17	08:14 15:21	08:44 15:21
Potential sun hours	227	262	366	429	515	539	538	474	386	321	241	207
Total, worst case												
Sun reduction			43		56			20	68	13		
Oper. time red.			0,22		0,42			0,35	0,31	0,26		
Wind dir. red.			0,99		0,99			0,99	0,99	0,99		
Total reduction			0,63		0,66			0,66	0,65	0,59		
Total, real			0,14		0,27			0,23	0,20	0,15		

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Stora Gluggebo - Shadow Receptor: 5,0 x 5,0 Azimuth: 0.0° Slope: 0.0° (805)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January			February			March			April			May			June		
1	08:43		14:06 (6)	08:04		15:26 (5)	06:56		16:25 (4)	06:31		18:39 (2)	05:11		04:10			
	15:22	16	14:22 (6)	16:23	15	15:41 (5)	17:29	26	16:51 (3)	19:38	11	18:50 (2)	20:44		21:45			
2	08:43		14:06 (6)	08:02		15:27 (5)	06:54		16:26 (4)	06:28		18:41 (2)	05:08		04:09			
	15:24	16	14:22 (6)	16:25	14	15:41 (5)	17:31	25	16:51 (3)	19:40	5	18:46 (2)	20:46		21:47			
3	08:42		14:07 (6)	08:00		15:27 (5)	06:51		16:28 (4)	06:25			05:06		04:07			
	15:25	16	14:23 (6)	16:28	13	15:40 (5)	17:33	24	16:52 (3)	19:42			20:49		21:48			
4	08:42		14:08 (6)	07:57		15:29 (5)	06:48		16:27 (3)	06:22			05:03		04:06			
	15:26	15	14:23 (6)	16:30	10	15:39 (5)	17:36	25	16:52 (3)	19:45			20:51		21:50			
5	08:41		14:08 (6)	07:55		15:31 (5)	06:45		16:27 (3)	06:19			05:01		04:05			
	15:28	15	14:23 (6)	16:32	7	15:38 (5)	17:38	25	16:52 (3)	19:47			20:53		21:51			
6	08:41		14:09 (6)	07:53			06:43		16:27 (3)	06:17			04:59		04:04			
	15:29	14	14:23 (6)	16:35			17:40	29	17:11 (1)	19:49			20:55		21:52			
7	08:40		14:10 (6)	07:51			06:40		16:27 (3)	06:14			04:56		04:03			
	15:31	14	14:24 (6)	16:37			17:42	32	17:13 (1)	19:51			20:57		21:54			
8	08:39		14:11 (6)	07:49			06:37		16:27 (3)	06:11			04:54		04:02			
	15:33	13	14:24 (6)	16:39			17:45	34	17:15 (1)	19:53			20:59		21:55			
9	08:39		14:12 (6)	07:46			06:35		16:27 (3)	06:08			04:52		04:02			
	15:34	12	14:24 (6)	16:42			17:47	36	17:17 (1)	19:56			21:02		21:56			
10	08:38		14:13 (6)	07:44			06:32		16:28 (3)	06:06			04:49		04:01			
	15:36	11	14:24 (6)	16:44			17:49	36	17:19 (1)	19:58			21:04		21:57			
11	08:37		14:14 (6)	07:42			06:29		16:30 (3)	06:03			04:47		04:00			
	15:38	8	14:22 (6)	16:47			17:52	32	17:19 (1)	20:00			21:06		21:58			
12	08:36		14:17 (6)	07:39			06:26		16:31 (3)	06:00			04:45		04:00			
	15:40	4	14:21 (6)	16:49			17:54	27	17:18 (1)	20:02			21:08		21:59			
13	08:35			07:37			06:24		16:34 (3)	05:57			04:43		03:59			
	15:42			16:51			17:56	18	17:16 (1)	20:04			21:10		22:00			
14	08:34			07:35			06:21			05:55			04:41		03:59			
	15:44			16:54			17:58			20:07			21:12		22:01			
15	08:32			07:32			06:18			05:52			04:39		03:58			
	15:45			16:56			18:00			20:09			21:14		22:01			
16	08:31			07:30			06:15			05:49			04:37		03:58			
	15:47			16:58			18:03			20:11			21:16		22:02			
17	08:30			07:27			06:12			05:47			04:35		03:58			
	15:50			17:01			18:05			20:13			21:18		22:03			
18	08:28			07:25			06:10			05:44			04:33		03:58			
	15:52			17:03			18:07			20:15			21:20		22:03			
19	08:27			07:22			06:07			05:41			04:31		03:58			
	15:54			17:06			18:09			20:18			21:22		22:03			
20	08:25			07:20			06:04			05:39			04:29		03:58			
	15:56			17:08			18:12			20:20			21:24		22:04			
21	08:24			07:17		16:29 (4)	06:01			05:36			04:27		03:58			
	15:58			17:10	7	16:36 (4)	18:14			20:22			21:26		22:04			
22	08:22			07:15		16:27 (4)	05:58		17:45 (2)	05:33			04:25		03:58			
	16:00			17:13	12	16:39 (4)	18:16	2	17:47 (2)	20:24			21:28		22:04			
23	08:21			07:12		16:26 (4)	05:56		17:41 (2)	05:31			04:23		03:58			
	16:02			17:15	14	16:40 (4)	18:18	8	17:49 (2)	20:27			21:30		22:04			
24	08:19			07:09		16:25 (4)	05:53		17:39 (2)	05:28			04:22		03:59			
	16:05			17:17	16	16:41 (4)	18:20	12	17:51 (2)	20:29			21:32		22:04			
25	08:17			07:07		16:25 (4)	05:50		17:37 (2)	05:26			04:20		03:59			
	16:07			17:20	17	16:42 (4)	18:23	16	17:53 (2)	20:31			21:34		22:04			
26	08:15		15:27 (5)	07:04		16:24 (4)	05:47		17:36 (2)	05:23			04:18		03:59			
	16:09	4	15:31 (5)	17:22	20	16:44 (3)	18:25	18	17:54 (2)	20:33			21:36		22:04			
27	08:14		15:25 (5)	07:02		16:24 (4)	05:44		17:36 (2)	05:20			04:17		04:00			
	16:11	8	15:33 (5)	17:24	23	16:47 (3)	18:27	18	17:54 (2)	20:35			21:37		22:04			
28	08:12		15:25 (5)	06:59		16:24 (4)	05:42		17:36 (2)	05:18			04:15		04:01			
	16:14	11	15:36 (5)	17:26	24	16:48 (3)	18:29	18	17:54 (2)	20:38			21:39		22:04			
29	08:10		15:25 (5)				06:39		18:36 (2)	05:15			04:14		04:01			
	16:16	13	15:38 (5)				19:31	17	18:53 (2)	20:40			21:41		22:04			
30	08:08		15:26 (5)				06:36		18:36 (2)	05:13			04:12		04:02			
	16:18	15	15:41 (5)				19:34	16	18:52 (2)	20:42			21:42		22:03			
31	08:06		15:25 (5)				06:33		18:37 (2)				04:11					
	16:21	15	15:40 (5)				19:36	14	18:51 (2)				21:44					
Potential sun hours	227			262			366		429				515		539			
Total, worst case	220			192			508		16									
Sun reduction	0,19			0,16			0,22		0,42									
Oper. time red.	0,99			0,99			0,99		0,99									
Wind dir. red.	0,69			0,69			0,67		0,65									
Total reduction	0,13			0,11			0,15		0,27									
Total, real	28			21			75		4									

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: Stora Gluggebo - Shadow Receptor: 5,0 x 5,0 Azimuth: 0.0° Slope: 0.0° (805)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03	04:52	05:58	07:01	17:11 (3)	07:10
	22:03	21:18	20:00	18:36	24	17:56 (1)
2	04:04	04:54	06:00	07:03	17:08 (3)	07:13
	22:02	21:16	19:57	18:33	32	17:57 (1)
3	04:05	04:56	06:02	07:06	17:06 (3)	07:15
	22:02	21:14	19:55	18:31	35	17:57 (1)
4	04:06	04:58	06:04	07:08	17:05 (3)	07:17
	22:01	21:11	19:52	18:28	37	17:56 (1)
5	04:07	05:00	06:06	07:10	17:04 (3)	07:20
	22:00	21:09	19:49	18:25	36	17:54 (1)
6	04:08	05:02	06:08	07:12	17:03 (3)	07:22
	21:59	21:07	19:46	18:22	34	17:51 (1)
7	04:09	05:05	06:11	07:14	17:03 (3)	07:24
	21:58	21:04	19:43	18:20	29	17:47 (1)
8	04:10	05:07	06:13	07:16	17:02 (3)	07:27
	21:57	21:02	19:41	18:17	26	17:44 (1)
9	04:12	05:09	06:15	07:19	17:02 (3)	07:29
	21:56	21:00	19:38	18:14	25	17:27 (3)
10	04:13	05:11	06:17	18:35 (2)	07:21	17:02 (3)
	21:55	20:57	19:35	18:39 (2)	18:11	17:26 (3)
11	04:14	05:13	06:19	18:31 (2)	07:23	17:01 (4)
	21:54	20:55	19:32	18:42 (2)	18:09	17:25 (3)
12	04:16	05:15	06:21	18:29 (2)	07:25	16:59 (4)
	21:53	20:53	19:30	18:43 (2)	18:06	17:25 (3)
13	04:17	05:17	06:23	18:28 (2)	07:27	16:58 (4)
	21:52	20:50	19:27	18:44 (2)	18:03	17:23 (3)
14	04:19	05:19	06:25	18:26 (2)	07:30	16:57 (4)
	21:50	20:48	19:24	18:44 (2)	18:01	17:21 (3)
15	04:20	05:22	06:27	18:26 (2)	07:32	16:56 (4)
	21:49	20:45	19:21	18:44 (2)	17:58	17:18 (3)
16	04:22	05:24	06:29	18:25 (2)	07:34	16:56 (4)
	21:48	20:43	19:18	18:43 (2)	17:55	17:14 (4)
17	04:24	05:26	06:32	18:25 (2)	07:36	16:56 (4)
	21:46	20:40	19:15	18:42 (2)	17:53	17:13 (4)
18	04:25	05:28	06:34	18:25 (2)	07:39	16:57 (4)
	21:44	20:37	19:13	18:41 (2)	17:50	17:13 (4)
19	04:27	05:30	06:36	18:25 (2)	07:41	16:57 (4)
	21:43	20:35	19:10	18:39 (2)	17:47	17:11 (4)
20	04:29	05:32	06:38	18:26 (2)	07:43	16:58 (4)
	21:41	20:32	19:07	18:36 (2)	17:45	17:09 (4)
21	04:31	05:34	06:40	18:28 (2)	07:45	17:01 (4)
	21:40	20:30	19:04	18:33 (2)	17:42	17:07 (4)
22	04:33	05:36	06:42	07:48	07:58	15:32
	21:38	20:27	19:01	17:40	15:32	15:13
23	04:34	05:39	06:44	07:50	08:00	15:12
	21:36	20:24	18:59	17:37	15:31	15:14
24	04:36	05:41	06:46	07:52	08:02	15:14
	21:34	20:22	18:56	17:34	15:29	15:15
25	04:38	05:43	06:49	06:54	08:04	15:15
	21:32	20:19	18:53	16:32	15:28	15:15
26	04:40	05:45	06:51	06:57	08:06	15:16
	21:30	20:16	18:50	16:29	15:26	15:16
27	04:42	05:47	06:53	06:59	08:08	15:17
	21:28	20:14	18:47	16:27	15:25	15:17
28	04:44	05:49	06:55	07:01	08:10	15:18
	21:26	20:11	18:45	16:24	15:24	15:18
29	04:46	05:51	06:57	07:03	08:12	15:19
	21:24	20:08	18:42	16:22	15:22	15:19
30	04:48	05:54	06:59	17:15 (3)	07:06	15:20
	21:22	20:06	18:39	17:55 (1)	16:20	15:20
31	04:50	05:56		07:08		15:21
	21:20	20:03		16:17		15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case			174	505	127	480
Sun reduction			0,31	0,26	0,17	0,13
Oper. time red.			0,99	0,99	0,99	0,99
Wind dir. red.			0,65	0,68	0,69	0,70
Total reduction			0,20	0,17	0,12	0,09
Total, real			35	88	15	44

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SALDEFALL 1:11>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (872)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	18:55 (B0021) 19:08 (B0021)	05:11 20:44
2	08:43 15:24	08:02 16:26	06:54 17:31	13 19:40	18:54 (B0021) 19:08 (B0021)	20:44 21:47
3	08:42 15:26	08:00 16:28	06:51 17:34	14 19:42	18:53 (B0021) 19:08 (B0021)	20:46 21:48
4	08:42 15:27	07:57 16:30	06:48 17:36	15 16:45 (B0023)	18:52 (B0021) 19:08 (B0021)	20:47 21:50
5	08:41 15:28	07:55 16:33	06:46 17:38	16 16:43 (B0023)	18:53 (B0021) 19:08 (B0021)	20:51 21:51
6	08:41 15:30	07:53 16:35	15:38 (B0024) 15:42 (B0024)	15 16:42 (B0023)	18:53 (B0021) 19:07 (B0021)	20:51 21:52
7	08:40 15:32	07:51 16:37	15:35 (B0024) 15:46 (B0024)	18 16:40 (B0023)	18:54 (B0021) 19:05 (B0021)	20:57 21:53
8	08:39 15:33	07:49 16:40	15:33 (B0024) 15:48 (B0024)	21 16:39 (B0023)	18:56 (B0021) 19:03 (B0021)	20:54 21:55
9	08:38 15:35	07:46 16:42	15:32 (B0024) 15:50 (B0024)	22 16:38 (B0023)	19:03 (B0021) 19:07 (B0021)	20:59 21:52
10	08:38 15:37	07:44 16:45	15:30 (B0024) 15:51 (B0024)	23 16:37 (B0023)	19:06 (B0021) 19:08 (B0021)	21:02 21:56
11	08:37 15:38	07:42 16:47	15:30 (B0024) 15:52 (B0024)	24 16:38 (B0023)	19:09 (B0021) 19:11 (B0021)	21:04 21:58
12	08:36 15:40	07:39 16:49	15:29 (B0024) 15:52 (B0024)	24 16:38 (B0023)	19:12 (B0021) 19:14 (B0021)	21:06 21:59
13	08:34 15:42	07:37 16:52	15:30 (B0024) 15:53 (B0024)	25 16:38 (B0023)	19:15 (B0021) 19:17 (B0021)	21:08 21:59
14	08:33 15:44	07:35 16:54	15:29 (B0024) 15:53 (B0024)	26 16:38 (B0023)	19:18 (B0021) 19:20 (B0021)	21:10 21:59
15	08:32 15:46	07:32 16:56	15:29 (B0024) 15:53 (B0024)	27 16:38 (B0023)	19:21 (B0021) 19:23 (B0021)	21:12 22:01
16	08:31 15:48	07:30 16:59	15:29 (B0024) 15:53 (B0024)	28 16:40 (B0023)	19:24 (B0021) 19:26 (B0021)	21:14 22:01
17	08:30 15:50	07:27 17:01	15:29 (B0024) 15:53 (B0024)	29 16:42 (B0023)	19:27 (B0021) 19:29 (B0021)	21:16 22:02
18	08:28 15:52	07:25 17:03	15:29 (B0024) 15:52 (B0024)	30 16:45 (B0023)	19:30 (B0021) 19:32 (B0021)	21:18 22:03
19	08:27 15:54	07:22 17:06	15:31 (B0024) 15:52 (B0024)	6 16:51 (B0023)	19:35 (B0021) 19:37 (B0021)	21:20 22:03
20	08:25 15:56	07:20 17:08	15:32 (B0024) 15:50 (B0024)	11 16:54 (B0023)	19:38 (B0021) 19:40 (B0021)	21:22 22:03
21	08:24 15:58	07:17 17:10	15:33 (B0024) 15:48 (B0024)	12 16:57 (B0023)	19:41 (B0021) 19:43 (B0021)	21:24 22:04
22	08:22 16:01	07:15 17:13	15:36 (B0024) 15:47 (B0024)	13 16:59 (B0023)	19:44 (B0021) 19:46 (B0021)	21:26 22:04
23	08:20 16:03	07:12 17:15	15:38 (B0024) 15:49 (B0024)	14 17:02 (B0023)	19:47 (B0021) 19:49 (B0021)	21:28 22:04
24	08:19 16:05	07:09 17:17	15:40 (B0024) 15:51 (B0024)	15 17:05 (B0023)	19:50 (B0021) 19:52 (B0021)	21:30 22:04
25	08:17 16:07	07:07 17:20	15:42 (B0024) 15:53 (B0024)	16 17:08 (B0023)	19:53 (B0021) 19:55 (B0021)	21:32 22:04
26	08:15 16:09	07:04 17:22	15:44 (B0024) 15:55 (B0024)	17 17:11 (B0023)	19:56 (B0021) 19:58 (B0021)	21:34 22:04
27	08:13 16:12	07:02 17:24	15:46 (B0024) 15:57 (B0024)	18 17:14 (B0023)	19:59 (B0021) 20:01 (B0021)	21:36 22:04
28	08:12 16:14	06:59 17:27	15:48 (B0024) 15:59 (B0024)	19 17:17 (B0023)	20:02 (B0021) 20:04 (B0021)	21:38 22:04
29	08:10 16:16		15:50 (B0024) 15:51 (B0024)	20 17:20 (B0023)	20:07 (B0021) 20:09 (B0021)	21:40 22:04
30	08:08 16:19		15:52 (B0024) 15:53 (B0024)	21 17:23 (B0023)	20:10 (B0021) 20:12 (B0021)	21:42 22:03
31	08:06 16:21		15:54 (B0024) 15:55 (B0024)	22 17:26 (B0023)	20:13 (B0021) 20:15 (B0021)	21:44 22:03
Potential sun hours	228	263	366	429	515	539
Total, worst case		321	294	208		
Sun reduction		0,16	0,22	0,42		
Oper. time red.		0,99	0,99	0,99		
Wind dir. red.		0,69	0,67	0,62		
Total reduction		0,11	0,15	0,26		
Total, real		36	44	55		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (872)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December		
1	04:03 22:02	04:52 21:18	05:58 20:00	07:01 18:36	17:17 (B0023) 17:40 (B0023)	07:10 16:15	15:00 (B0024) 15:20 (B0024)	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	17:16 (B0023) 17:40 (B0023)	07:13 16:13	15:02 (B0024) 15:19 (B0024)	08:17 15:20
3	04:05 22:01	04:57 21:13	06:02 19:55	07:06 18:31	17:15 (B0023) 17:39 (B0023)	07:15 16:10	15:02 (B0024) 15:17 (B0024)	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:54 (B0021) 19:00 (B0021)	17:15 (B0023) 17:39 (B0023)	07:17 16:08	15:05 (B0024) 15:16 (B0024)	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:51 (B0021) 19:02 (B0021)	17:16 (B0023) 17:39 (B0023)	07:20 16:06	15:09 (B0024) 15:10 (B0024)	08:22 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:49 (B0021) 19:03 (B0021)	17:16 (B0023) 17:37 (B0023)	07:22 16:04		08:24 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:48 (B0021) 19:03 (B0021)	17:16 (B0023) 17:36 (B0023)	07:24 16:01		08:26 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	07:17 18:48 (B0021) 19:03 (B0021)	17:17 (B0023) 17:34 (B0023)	07:26 15:59		08:27 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:47 (B0021) 19:03 (B0021)	17:19 (B0023) 17:32 (B0023)	07:29 15:57		08:29 15:14
10	04:14 21:55	05:11 20:57	06:17 19:35	07:21 18:47 (B0021) 19:02 (B0021)	17:22 (B0023) 18:12	07:31 6		08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:47 (B0021) 19:01 (B0021)	17:23 18:09	07:33 15:53		08:31 15:13
12	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:48 (B0021) 18:59 (B0021)	17:25 18:06	07:36 15:51		08:33 15:13
13	04:18 21:51	05:18 20:50	06:23 19:27	07:27 18:49 (B0021) 18:56 (B0021)	17:27 18:03	07:38 15:49		08:34 15:13
14	04:19 21:50	05:20 20:47	06:25 19:24	07:30 18:01	17:30 15:47	07:40 15:47		08:35 15:13
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	17:32 15:45	07:42 15:45		08:36 15:12
16	04:23 21:47	05:24 20:42	06:30 19:18	07:34 17:55	17:34 15:43	07:45 15:43		08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	17:36 15:41	07:47 15:41		08:38 15:12
18	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	17:39 15:39	07:49 15:39		08:39 15:13
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	16:09 (B0024) 6	07:51 15:38		08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	16:05 (B0024) 13	07:53 15:36		08:40 15:13
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	16:03 (B0024) 17	07:55 15:34		08:41 15:13
22	04:33 21:38	05:37 20:27	19:31 (B0020) 5	06:42 19:36 (B0020)	07:48 17:40	07:58 20		08:42 15:14
23	04:35 21:36	05:39 20:24	19:29 (B0020) 9	06:44 19:38 (B0020)	07:50 17:37	08:00 21		08:42 15:14
24	04:37 21:34	05:41 20:22	19:27 (B0020) 12	06:47 19:39 (B0020)	07:52 17:35	08:02 22		08:42 15:15
25	04:39 21:32	05:43 20:19	19:26 (B0020) 13	06:49 19:39 (B0020)	06:54 16:32	08:04 24		08:43 15:16
26	04:41 21:30	05:45 20:16	19:26 (B0020) 13	06:51 19:39 (B0020)	17:25 (B0023) 11	08:06 16:30		08:43 15:17
27	04:43 21:28	05:47 20:14	19:25 (B0020) 14	06:53 19:39 (B0020)	17:22 (B0023) 16	08:08 24		08:43 15:17
28	04:44 21:26	05:50 20:11	19:25 (B0020) 13	06:55 19:38 (B0020)	17:20 (B0023) 19	08:10 25		08:43 15:18
29	04:46 21:24	05:52 20:08	19:26 (B0020) 11	06:57 19:37 (B0020)	17:19 (B0023) 21	08:12 24		08:43 15:19
30	04:48 21:22	05:54 20:06	19:26 (B0020) 8	06:59 19:34 (B0020)	17:18 (B0023) 22	08:14 23		08:43 15:20
31	04:50 21:20	05:56 20:03	19:28 (B0020) 4	06:59 19:32 (B0020)	17:40 (B0023) 22	15:22 (B0024) 15:22 (B0024)		08:43 15:21
Potential sun hours	538	474	386	321	241	207		
Total, worst case		102	213	460	64			
Sun reduction		0,35	0,31	0,26	0,17			
Oper. time red.		0,99	0,99	0,99	0,99			
Wind dir. red.		0,61	0,65	0,68	0,69			
Total reduction		0,22	0,20	0,18	0,12			
Total, real		22	43	81	8			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (820)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	18:56 (B0021) 19:09 (B0021)	05:11 20:44
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	18:55 (B0021) 19:09 (B0021)	05:08 20:46
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:42	18:54 (B0021) 19:09 (B0021)	05:06 20:49
4	08:42 15:27	07:57 16:30	06:48 17:36	16:46 (B0023) 16:54 (B0023)	06:22 19:45	18:53 (B0021) 19:09 (B0021)
5	08:41 15:28	07:55 16:33	06:46 17:38	16:43 (B0023) 16:57 (B0023)	06:20 19:47	18:54 (B0021) 19:09 (B0021)
6	08:41 15:30	07:53 16:35	15:35 (B0024) 15:42 (B0024)	06:43 17:40	16:42 (B0023) 17:00 (B0023)	06:17 19:49
7	08:40 15:32	07:51 16:37	15:33 (B0024) 15:45 (B0024)	06:40 17:43	16:40 (B0023) 17:00 (B0023)	06:14 19:51
8	08:39 15:33	07:49 16:40	15:31 (B0024) 15:47 (B0024)	06:37 17:45	16:39 (B0023) 17:01 (B0023)	06:11 19:53
9	08:38 15:35	07:46 16:42	15:30 (B0024) 15:49 (B0024)	06:35 17:47	16:38 (B0023) 17:01 (B0023)	06:09 19:56
10	08:38 15:37	07:44 16:45	15:28 (B0024) 15:49 (B0024)	06:32 17:49	16:37 (B0023) 17:01 (B0023)	06:06 19:58
11	08:37 15:38	07:42 16:47	15:28 (B0024) 15:51 (B0024)	06:29 17:52	16:37 (B0023) 17:02 (B0023)	06:03 20:00
12	08:36 15:40	07:39 16:49	15:27 (B0024) 15:51 (B0024)	06:26 17:54	16:37 (B0023) 17:01 (B0023)	06:00 20:02
13	08:34 15:42	07:37 16:52	15:28 (B0024) 15:52 (B0024)	06:24 17:56	16:37 (B0023) 17:01 (B0023)	05:58 20:04
14	08:33 15:44	07:35 16:54	15:27 (B0024) 15:52 (B0024)	06:21 17:58	16:37 (B0023) 17:00 (B0023)	05:55 20:07
15	08:32 15:46	07:32 16:56	15:27 (B0024) 15:51 (B0024)	06:18 18:01	16:37 (B0023) 16:59 (B0023)	05:52 20:09
16	08:31 15:48	07:30 16:59	15:27 (B0024) 15:52 (B0024)	06:15 18:03	16:39 (B0023) 16:58 (B0023)	05:50 20:11
17	08:30 15:50	07:27 17:01	15:27 (B0024) 15:51 (B0024)	06:13 18:05	16:40 (B0023) 16:56 (B0023)	05:47 20:13
18	08:28 15:52	07:25 17:03	15:28 (B0024) 15:50 (B0024)	06:10 18:07	16:42 (B0023) 16:53 (B0023)	05:44 20:15
19	08:27 15:54	07:22 17:06	15:29 (B0024) 15:50 (B0024)	06:07 18:09	05:42 20:18	19:24 (B0020) 19:37 (B0020)
20	08:25 15:56	07:20 17:08	15:30 (B0024) 15:49 (B0024)	06:04 18:12	05:39 20:20	19:24 (B0020) 19:35 (B0020)
21	08:24 15:58	07:17 17:11	15:31 (B0024) 15:47 (B0024)	06:01 18:14	05:36 20:22	19:26 (B0020) 19:34 (B0020)
22	08:22 16:01	07:15 17:13	15:34 (B0024) 15:46 (B0024)	05:59 18:16	05:34 20:24	21:26 21:28
23	08:20 16:03	07:12 17:15	05:56 18:18	05:56 20:26	05:31 20:26	04:24 21:30
24	08:19 16:05	07:09 17:17	05:53 18:20	05:29 20:29	05:29 21:32	04:22 21:32
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	05:26 21:33	04:20 21:33
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	05:23 21:35	04:19 21:35
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	05:21 21:37	04:17 21:37
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	05:18 21:39	04:16 21:39
29	08:10 16:16		06:39 19:31	05:16 20:40	04:14 21:40	21:00 (B0018) 21:01 (B0018)
30	08:08 16:19		06:36 19:34	05:13 20:42	04:13 21:42	21:00 (B0018) 21:02 (B0018)
31	08:06 16:21		06:34 19:36	18:58 (B0021) 19:06 (B0021)	04:12 21:44	21:00 (B0018) 21:04 (B0018)
Potential sun hours	228	263	366	429	515	539
Total, worst case		334	301	217	7	362
Sun reduction		0,16	0,22	0,42	0,53	0,43
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,69	0,67	0,62	0,57	0,57
Total reduction		0,11	0,15	0,27	0,31	0,25
Total, real		38	45	58	2	89

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:12>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (820)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July			August			September			October			November			December		
1	04:03		21:04 (B0018)	04:53			05:58			07:01		17:16 (B0023)	07:10		14:58 (B0024)	08:16		
	22:02	13	21:17 (B0018)	21:18			20:00			18:36	24	17:40 (B0023)	16:15	21	15:19 (B0024)	15:21		
2	04:04		21:04 (B0018)	04:55			06:00			07:04		17:16 (B0023)	07:13		15:00 (B0024)	08:17		
	22:02	14	21:18 (B0018)	21:16			19:57			18:34	24	17:40 (B0023)	16:13	18	15:18 (B0024)	15:20		
3	04:05		21:04 (B0018)	04:57			06:02		18:56 (B0021)	07:06		17:15 (B0023)	07:15		15:00 (B0024)	08:19		
	22:01	14	21:18 (B0018)	21:13			19:55	5	19:01 (B0021)	18:31	24	17:39 (B0023)	16:10	16	15:16 (B0024)	15:19		
4	04:06		21:05 (B0018)	04:59			06:04		18:53 (B0021)	07:08		17:15 (B0023)	07:17		15:03 (B0024)	08:21		
	22:01	13	21:18 (B0018)	21:11			19:52	10	19:03 (B0021)	18:28	24	17:39 (B0023)	16:08	12	15:15 (B0024)	15:18		
5	04:07		21:05 (B0018)	05:01			06:07		18:51 (B0021)	07:10		17:16 (B0023)	07:20		15:05 (B0024)	08:22		
	22:00	13	21:18 (B0018)	21:09			19:49	13	19:04 (B0021)	18:25	23	17:39 (B0023)	16:06	6	15:11 (B0024)	15:17		
6	04:08		21:05 (B0018)	05:03			06:09		18:50 (B0021)	07:12		17:16 (B0023)	07:22			08:24		
	21:59	12	21:17 (B0018)	21:07			19:46	14	19:04 (B0021)	18:22	21	17:37 (B0023)	16:04			15:16		
7	04:10		21:05 (B0018)	05:05			06:11		18:49 (B0021)	07:14		17:16 (B0023)	07:24			08:26		
	21:58	11	21:16 (B0018)	21:04			19:44	15	19:04 (B0021)	18:20	20	17:36 (B0023)	16:01			15:15		
8	04:11		21:05 (B0018)	05:07			06:13		18:48 (B0021)	07:17		17:17 (B0023)	07:26			08:27		
	21:57	10	21:15 (B0018)	21:02			19:41	16	19:04 (B0021)	18:17	16	17:33 (B0023)	15:59			15:15		
9	04:12		21:05 (B0018)	05:09			06:15		18:48 (B0021)	07:19		17:20 (B0023)	07:29			08:29		
	21:56	9	21:14 (B0018)	21:00			19:38	15	19:03 (B0021)	18:14	12	17:32 (B0023)	15:57			15:14		
10	04:14		21:07 (B0018)	05:11			06:17		18:48 (B0021)	07:21		17:24 (B0023)	07:31			08:30		
	21:55	7	21:14 (B0018)	20:57			19:35	15	19:03 (B0021)	18:12	2	17:26 (B0023)	15:55			15:14		
11	04:15		21:07 (B0018)	05:13			06:19		18:49 (B0021)	07:23			07:33			08:31		
	21:54	6	21:13 (B0018)	20:55			19:32	12	19:01 (B0021)	18:09			15:53			15:13		
12	04:16		21:07 (B0018)	05:15			06:21		18:50 (B0021)	07:25			07:36			08:33		
	21:53	5	21:12 (B0018)	20:52			19:30	9	18:59 (B0021)	18:06			15:51			15:13		
13	04:18		21:08 (B0018)	05:18			06:23		18:53 (B0021)	07:27			07:38			08:34		
	21:51	3	21:11 (B0018)	20:50			19:27	2	18:55 (B0021)	18:03			15:49			15:13		
14	04:19		21:09 (B0018)	05:20			06:25			07:30			07:40			08:35		
	21:50	1	21:10 (B0018)	20:47			19:24			18:01			15:47			15:13		
15	04:21			05:22			06:28			07:32			07:42			08:36		
	21:49			20:45			19:21			17:58			15:45			15:12		
16	04:23			05:24			06:30			07:34			07:45			08:37		
	21:47			20:42			19:18			17:55			15:43			15:12		
17	04:24			05:26			06:32			07:36			07:47			08:38		
	21:46			20:40			19:16			17:53			15:41			15:12		
18	04:26			05:28			06:34			07:39			07:49			08:39		
	21:44			20:37			19:13			17:50			15:39			15:13		
19	04:28			05:30			06:36			07:41		16:07 (B0024)	07:51			08:40		
	21:43			20:35			19:10			17:48	7	16:14 (B0024)	15:38			15:13		
20	04:29			05:33			06:38			07:43		16:03 (B0024)	07:53			08:40		
	21:41			20:32			19:07			17:45	14	16:17 (B0024)	15:36			15:13		
21	04:31			05:35		19:34 (B0020)	06:40			07:45		16:02 (B0024)	07:55			08:41		
	21:39			20:30	3	19:37 (B0020)	19:04			17:42	17	16:19 (B0024)	15:34			15:13		
22	04:33			05:37		19:31 (B0020)	06:42			07:48		16:00 (B0024)	07:58			08:42		
	21:38			20:27	8	19:39 (B0020)	19:02			17:40	19	16:19 (B0024)	15:33			15:14		
23	04:35			05:39		19:29 (B0020)	06:44			07:50		15:59 (B0024)	08:00			08:42		
	21:36			20:24	11	19:40 (B0020)	18:59			17:37	22	16:21 (B0024)	15:31			15:14		
24	04:37			05:41		19:28 (B0020)	06:47			07:52		15:58 (B0024)	08:02			08:42		
	21:34			20:22	13	19:41 (B0020)	18:56			17:35	23	16:21 (B0024)	15:30			15:15		
25	04:39			05:43		19:27 (B0020)	06:49		17:26 (B0023)	06:54		14:58 (B0024)	08:04			08:43		
	21:32			20:19	14	19:41 (B0020)	18:53	9	17:35 (B0023)	16:32	24	15:22 (B0024)	15:28			15:16		
26	04:41			05:45		19:27 (B0020)	06:51		17:23 (B0023)	06:57		14:57 (B0024)	08:06			08:43		
	21:30			20:16	14	19:41 (B0020)	18:50	14	17:37 (B0023)	16:30	24	15:21 (B0024)	15:27			15:17		
27	04:43			05:47		19:27 (B0020)	06:53		17:21 (B0023)	06:59		14:57 (B0024)	08:08			08:43		
	21:28			20:14	13	19:40 (B0020)	18:47	18	17:39 (B0023)	16:27	25	15:22 (B0024)	15:25			15:17		
28	04:44			05:50		19:27 (B0020)	06:55		17:19 (B0023)	07:01		14:57 (B0024)	08:10			08:43		
	21:26			20:11	12	19:39 (B0020)	18:45	20	17:39 (B0023)	16:25	24	15:21 (B0024)	15:24			15:18		
29	04:46			05:52		19:27 (B0020)	06:57		17:18 (B0023)	07:03		14:57 (B0024)	08:12			08:43		
	21:24			20:08	10	19:37 (B0020)	18:42	23	17:41 (B0023)	16:22	24	15:21 (B0024)	15:23			15:19		
30	04:48			05:54		19:29 (B0020)	06:59		17:17 (B0023)	07:06		14:57 (B0024)	08:14			08:43		
	21:22			20:06	5	19:34 (B0020)	18:39	24	17:41 (B0023)	16:20	23	15:20 (B0024)	15:22			15:20		
31	04:50			05:56						07:08		14:58 (B0024)				08:43		
	21:20			20:03						16:17	22	15:20 (B0024)				15:21		
Potential sun hours	538			474			386			321			241			207		
Total, worst case		131			103		234			458			73					
Sun reduction		0,38			0,35		0,31			0,26			0,17					
Oper. time red.		0,99			0,99		0,99			0,99			0,99					
Wind dir. red.		0,57			0,61		0,65			0,68			0,69					
Total reduction		0,22			0,22		0,21			0,18			0,12					
Total, real		29			22		48			81			9					

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (821)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	18:36 (B0024) 18:54 (B0024)	05:11 20:44
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	18:34 (B0024) 18:55 (B0024)	05:08 20:46
3	08:42 15:26	07:59 16:28	06:51 17:34	06:25 19:42	18:32 (B0024) 18:56 (B0024)	05:06 20:48
4	08:42 15:27	07:57 16:30	06:48 17:36	06:22 19:45	18:31 (B0024) 18:56 (B0024)	05:04 20:51
5	08:41 15:28	07:55 16:33	06:46 17:38	06:20 19:47	18:31 (B0024) 18:57 (B0024)	05:01 20:53
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	18:30 (B0024) 18:57 (B0024)	04:59 20:55
7	08:40 15:32	07:51 16:37	06:40 17:43	06:14 19:51	18:29 (B0024) 18:56 (B0024)	04:57 20:57
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	18:30 (B0024) 18:57 (B0024)	04:54 20:59
9	08:38 15:35	07:46 16:42	06:35 17:47	06:09 19:56	18:29 (B0024) 18:56 (B0024)	04:52 21:01
10	08:37 15:37	07:44 16:45	06:32 17:49	06:06 19:58	18:29 (B0024) 18:55 (B0024)	04:50 21:04
11	08:36 15:38	07:42 16:47	06:29 17:52	06:03 20:00	18:30 (B0024) 18:55 (B0024)	04:48 21:06
12	08:35 15:40	07:39 16:49	06:26 17:54	06:00 20:02	18:30 (B0024) 18:54 (B0024)	04:45 21:08
13	08:34 15:42	07:37 16:52	06:24 17:56	05:58 20:04	18:31 (B0024) 18:52 (B0024)	04:43 21:10
14	08:33 15:44	07:34 16:54	06:21 17:58	05:55 20:07	18:33 (B0024) 18:51 (B0024)	04:41 21:12
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	18:34 (B0024) 18:48 (B0024)	04:39 21:14
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	18:37 (B0024) 18:45 (B0024)	04:37 21:16
17	08:29 15:50	07:27 17:01	06:13 18:05	05:47 20:13		04:35 21:18
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:15		04:33 21:20
19	08:27 15:54	07:22 17:06	06:07 18:09	05:42 20:18		04:31 21:22
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	19:38 (B0023) 19:43 (B0023)	04:29 21:24
21	08:24 15:58	07:17 17:11	06:01 18:14	05:36 20:22	19:35 (B0023) 19:47 (B0023)	04:27 21:26
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	19:32 (B0023) 19:48 (B0023)	04:26 21:28
23	08:20 16:03	07:12 17:15	05:56 18:18	05:31 20:26	19:31 (B0023) 19:49 (B0023)	04:24 21:30
24	08:19 16:05	07:09 17:17	05:53 18:20	05:29 20:29	19:30 (B0023) 19:50 (B0023)	04:22 21:32
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	19:29 (B0023) 19:51 (B0023)	04:21 21:33
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	19:29 (B0023) 19:51 (B0023)	04:19 21:35
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	19:28 (B0023) 19:51 (B0023)	04:17 21:37
28	08:11 16:14	06:59 17:27	05:42 18:29	05:18 20:37	19:28 (B0023) 20:05 (B0021)	04:16 21:39
29	08:10 16:16		06:39 19:31	05:16 20:40	19:28 (B0023) 20:06 (B0021)	04:14 21:40
30	08:08 16:19		06:36 19:34	05:13 20:42	19:28 (B0023) 20:08 (B0021)	04:13 21:42
31	08:06 16:21		06:34 19:36	18:37 (B0024) 18:52 (B0024)		04:12 21:44
Potential sun hours	228	263	366	429	515	538
Total, worst case			23	575		194
Sun reduction			0,22	0,42		0,53
Oper. time red.			0,99	0,99		0,99
Wind dir. red.			0,65	0,63		0,60
Total reduction			0,14	0,26		0,31
Total, real			3	152		61

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SALDEFALL 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (821)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:04 22:02	04:53 21:18	05:58 20:00	18:29 (B0024) 18:54 (B0024)	07:01 18:36	08:15 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	18:28 (B0024) 18:54 (B0024)	07:04 18:34	08:17 15:20
3	04:05 22:01	04:57 21:13	06:02 19:55	18:27 (B0024) 18:54 (B0024)	07:06 18:31	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	18:27 (B0024) 18:54 (B0024)	07:08 18:28	08:21 15:18
5	04:07 22:00	05:01 21:09	20:13 (B0021) 20:20 (B0021)	06:07 19:49	18:26 (B0024) 18:53 (B0024)	07:10 18:25
6	04:09 21:59	05:03 21:07	19:45 (B0023) 20:21 (B0021)	06:09 19:46	18:26 (B0024) 18:53 (B0024)	07:12 18:22
7	04:10 21:58	05:05 21:04	19:42 (B0023) 20:22 (B0021)	06:11 19:44	18:26 (B0024) 18:52 (B0024)	07:14 18:20
8	04:11 21:57	05:07 21:02	19:41 (B0023) 20:23 (B0021)	06:13 19:41	18:26 (B0024) 18:51 (B0024)	07:17 18:17
9	04:12 21:56	05:09 21:00	19:39 (B0023) 20:23 (B0021)	06:15 19:38	18:26 (B0024) 18:50 (B0024)	07:19 18:14
10	04:14 21:55	05:11 20:57	19:38 (B0023) 20:23 (B0021)	06:17 19:35	18:27 (B0024) 18:49 (B0024)	07:21 18:12
11	04:15 21:54	05:13 20:55	19:37 (B0023) 20:21 (B0021)	06:19 19:32	18:28 (B0024) 18:47 (B0024)	07:23 18:09
12	04:16 21:53	05:16 20:52	19:37 (B0023) 20:19 (B0021)	06:21 19:30	18:29 (B0024) 18:44 (B0024)	07:25 18:06
13	04:18 21:51	05:18 20:50	19:36 (B0023) 20:16 (B0021)	06:23 19:27	18:32 (B0024) 18:41 (B0024)	07:27 18:03
14	04:19 21:50	05:20 20:47	19:36 (B0023) 20:14 (B0021)	06:25 19:24	07:30 18:01	15:49 15:47
15	04:21 21:49	05:22 20:45	19:36 (B0023) 19:58 (B0023)	06:28 19:21	07:32 17:58	15:41 15:45
16	04:23 21:47	05:24 20:42	19:36 (B0023) 19:58 (B0023)	06:30 19:18	07:34 17:55	15:45 15:43
17	04:24 21:46	05:26 20:40	19:36 (B0023) 19:58 (B0023)	06:32 19:16	07:36 17:53	15:47 15:41
18	04:26 21:44	05:28 20:37	19:36 (B0023) 19:57 (B0023)	06:34 19:13	07:39 17:50	15:49 15:43
19	04:28 21:43	05:30 20:35	19:36 (B0023) 19:56 (B0023)	06:36 19:10	07:41 17:48	15:41 15:38
20	04:29 21:41	05:33 20:32	19:37 (B0023) 19:55 (B0023)	06:38 19:07	07:43 17:45	15:43 15:36
21	04:31 21:39	05:35 20:30	19:38 (B0023) 19:53 (B0023)	06:40 19:04	07:45 17:42	15:41 15:34
22	04:33 21:38	05:37 20:27	19:40 (B0023) 19:51 (B0023)	06:42 19:02	07:47 17:40	15:41 15:33
23	04:35 21:36	05:39 20:24	19:43 (B0023) 19:47 (B0023)	06:44 18:59	07:50 17:37	15:41 15:31
24	04:37 21:34	05:41 20:22	06:47 18:56	06:47 18:56	07:52 17:35	15:42 15:30
25	04:39 21:32	05:43 20:19	06:49 18:53	06:49 18:53	06:54 16:32	15:43 15:28
26	04:41 21:30	05:45 20:16	06:51 18:50	06:51 18:50	06:57 16:30	15:43 15:27
27	04:43 21:28	05:47 20:14	18:39 (B0024) 18:48 (B0024)	06:53 18:47	06:59 16:27	15:43 15:25
28	04:45 21:26	05:50 20:11	18:36 (B0024) 18:50 (B0024)	06:55 18:45	07:01 16:25	15:43 15:24
29	04:46 21:24	05:52 20:08	18:34 (B0024) 18:52 (B0024)	06:57 18:42	07:03 16:22	15:43 15:23
30	04:48 21:22	05:54 20:06	18:32 (B0024) 18:53 (B0024)	06:59 18:39	07:06 16:20	15:43 15:22
31	04:51 21:20	05:56 20:03	18:30 (B0024) 18:54 (B0024)	06:59 18:54	07:08 16:18	15:43 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		502	299			
Sun reduction		0,35	0,31			
Oper. time red.		0,99	0,99			
Wind dir. red.		0,60	0,65			
Total reduction		0,21	0,20			
Total, real		106	60			

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (819)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January	February	March	April	May	June
1	08:43	08:04	06:56	06:31	19:01 (B0021)	05:11
	15:23	16:23	17:29	19:38	8	20:44
2	08:43	08:02	06:54	06:28	18:58 (B0021)	05:08
	15:24	16:26	17:31	19:40	12	20:46
3	08:42	08:00	15:22 (B0024)	06:25	18:56 (B0021)	05:06
	15:26	16:28	9	15:31 (B0024)	17:34	20:49
4	08:42	07:57	15:20 (B0024)	06:22	18:55 (B0021)	05:04
	15:27	16:30	14	15:34 (B0024)	17:36	20:51
5	08:41	07:55	15:19 (B0024)	06:20	18:55 (B0021)	05:01
	15:28	16:33	18	15:37 (B0024)	17:38	20:53
6	08:41	07:53	15:17 (B0024)	06:17	18:55 (B0021)	04:59
	15:30	16:35	20	15:37 (B0024)	17:40	21:52
7	08:40	07:51	15:17 (B0024)	06:14	18:54 (B0021)	04:57
	15:32	16:37	22	15:39 (B0024)	17:43	21:53
8	08:39	07:49	15:15 (B0024)	06:11	18:55 (B0021)	04:54
	15:33	16:40	24	15:39 (B0024)	17:45	21:55
9	08:38	07:46	15:15 (B0024)	06:09	18:56 (B0021)	04:52
	15:35	16:42	26	15:41 (B0024)	17:47	21:56
10	08:38	07:44	15:14 (B0024)	06:06	18:57 (B0021)	04:50
	15:37	16:45	27	15:41 (B0024)	17:49	21:57
11	08:37	07:42	15:15 (B0024)	06:03	19:01 (B0021)	04:48
	15:38	16:47	26	15:41 (B0024)	17:52	21:58
12	08:36	07:39	15:14 (B0024)	06:00	19:04 (B0021)	04:45
	15:40	16:49	27	15:41 (B0024)	17:54	21:59
13	08:34	07:37	15:15 (B0024)	05:58		04:43
	15:42	16:52	27	15:42 (B0024)	17:56	21:10
14	08:33	07:35	15:15 (B0024)	05:55		04:41
	15:44	16:54	26	15:41 (B0024)	17:58	21:12
15	08:32	07:32	15:15 (B0024)	05:52	19:31 (B0020)	04:39
	15:46	16:56	26	15:41 (B0024)	18:01	22:01
16	08:31	07:30	15:16 (B0024)	05:50	7	19:38 (B0020)
	15:48	16:59	25	15:41 (B0024)	18:03	22:02
17	08:30	07:27	15:16 (B0024)	05:47	12	19:40 (B0020)
	15:50	17:01	24	15:40 (B0024)	18:05	22:02
18	08:28	07:25	15:17 (B0024)	05:44	13	19:41 (B0020)
	15:52	17:03	21	15:38 (B0024)	18:07	22:03
19	08:27	07:22	15:19 (B0024)	05:42	14	19:41 (B0020)
	15:54	17:06	19	15:38 (B0024)	18:09	22:03
20	08:25	07:20	15:20 (B0024)	05:39	15	19:42 (B0020)
	15:56	17:08	16	15:36 (B0024)	18:12	22:03
21	08:24	07:17	15:23 (B0024)	05:36	15	19:41 (B0020)
	15:58	17:11	9	15:32 (B0024)	18:14	22:04
22	08:22	07:15		05:34	14	19:41 (B0020)
	16:01	17:13		17:34 (B0016)	05:34	04:26
23	08:20	07:12		05:31	12	19:39 (B0020)
	16:03	17:15		17:35 (B0016)	05:31	04:24
24	08:19	07:09		05:29	10	19:39 (B0020)
	16:05	17:17		17:37 (B0016)	05:29	04:22
25	08:17	07:07		05:26	6	19:36 (B0020)
	16:07	17:20		18:23		04:20
26	08:15	07:04		05:23		04:19
	16:09	17:22		18:25		21:35
27	08:13	07:02		05:21		04:17
	16:12	17:24		18:27		21:37
28	08:12	06:59		05:18		04:16
	16:14	17:27		18:29		21:39
29	08:10			05:16		04:14
	16:16			19:31		21:40
30	08:08			05:13		04:13
	16:19			19:34		21:42
31	08:06			05:10		04:12
	16:21			19:36		21:44
Potential sun hours	228	263	366	429	515	539
Total, worst case		406	411	260		210
Sun reduction		0,16	0,22	0,42		0,43
Oper. time red.		0,99	0,99	0,99		0,99
Wind dir. red.		0,69	0,67	0,62		0,57
Total reduction		0,11	0,15	0,27		0,24
Total, real		45	62	69		51

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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SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (819)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 21:12 (B0018) 04:53	05:58 19:00 (B0021) 07:01	17:11 (B0023) 07:10	14:44 (B0024) 08:16		
2	22:02 7 21:19 (B0018) 21:18	20:00 3 19:03 (B0021) 18:36	26 17:37 (B0023) 16:15	26 15:10 (B0024) 15:21		
3	04:04 21:13 (B0018) 04:55	06:00 18:56 (B0021) 07:04	17:10 (B0023) 07:13	14:45 (B0024) 08:17		
4	22:02 6 21:19 (B0018) 21:16	19:57 10 19:06 (B0021) 18:34	27 17:37 (B0023) 16:13	25 15:10 (B0024) 15:20		
5	04:05 21:13 (B0018) 04:57	06:02 18:54 (B0021) 07:06	17:09 (B0023) 07:15	14:45 (B0024) 08:19		
6	22:01 6 21:19 (B0018) 21:13	19:55 13 19:07 (B0021) 18:31	27 17:36 (B0023) 16:10	24 15:09 (B0024) 15:19		
7	04:06 21:14 (B0018) 04:59	06:04 18:53 (B0021) 07:08	17:09 (B0023) 07:17	14:46 (B0024) 08:21		
8	22:01 4 21:18 (B0018) 21:11	19:52 15 19:08 (B0021) 18:28	26 17:35 (B0023) 16:08	23 15:09 (B0024) 15:18		
9	04:07 21:14 (B0018) 05:01	06:07 16 18:52 (B0021) 07:10	17:10 (B0023) 07:20	14:47 (B0024) 08:22		
10	22:00 4 21:18 (B0018) 21:09	19:49 16 19:08 (B0021) 18:25	25 17:35 (B0023) 16:06	20 15:07 (B0024) 15:17		
11	04:08 21:15 (B0018) 05:03	06:09 17 18:51 (B0021) 07:12	17:10 (B0023) 07:22	14:48 (B0024) 08:24		
12	21:59 2 21:17 (B0018) 21:07	19:46 17 19:08 (B0021) 18:23	24 17:34 (B0023) 16:04	18 15:06 (B0024) 15:16		
13	04:10 21:15 (B0018) 05:05	06:11 17 18:50 (B0021) 07:14	17:10 (B0023) 07:24	14:50 (B0024) 08:26		
14	21:58 1 21:16 (B0018) 21:04	19:44 17 19:07 (B0021) 18:20	23 17:33 (B0023) 16:01	14 15:04 (B0024) 15:15		
15	04:11 21:07	06:13 16 19:06 (B0021) 18:17	20 17:31 (B0023) 15:59	9 15:02 (B0024) 15:15		
16	21:57 21:02	06:15 14 19:05 (B0021) 18:14	16 17:29 (B0023) 15:57			
17	04:12 21:09	19:38 14 18:51 (B0021) 07:21	17:15 (B0023) 07:31			
18	21:56 21:00	06:17 13 19:04 (B0021) 18:12	11 17:26 (B0023) 15:55			
19	04:14 20:57	19:35 13 18:53 (B0021) 07:23				
20	21:55 20:55	06:19 8 19:01 (B0021) 18:09				
21	04:15 20:53	19:32 14 19:06 (B0021) 18:17				
22	21:54 20:52	06:21 14 18:51 (B0021) 07:21				
23	04:16 20:51	19:30 13 19:04 (B0021) 18:12				
24	21:53 20:50	06:23 13 18:53 (B0021) 07:23				
25	04:18 20:48	19:32 8 19:01 (B0021) 18:09				
26	21:51 20:47	06:25 13 18:53 (B0021) 07:23				
27	04:19 20:47	19:27 13 18:53 (B0021) 07:23				
28	21:50 20:47	06:25 13 18:53 (B0021) 07:23				
29	04:21 20:47	19:24 13 18:53 (B0021) 07:23				
30	21:49 20:45	06:28 13 18:53 (B0021) 07:23				
31	04:23 20:45	19:21 13 18:53 (B0021) 07:23				
32	21:47 20:42	06:30 13 18:53 (B0021) 07:23				
33	04:24 20:42	19:18 13 18:53 (B0021) 07:23				
34	21:46 20:40	06:32 13 18:53 (B0021) 07:23				
35	04:26 20:38	19:16 13 18:53 (B0021) 07:23				
36	21:44 20:37	06:34 13 18:53 (B0021) 07:23				
37	04:28 20:35	19:13 13 18:53 (B0021) 07:23				
38	21:43 20:35	06:36 13 18:53 (B0021) 07:23				
39	04:29 20:33	19:10 13 18:53 (B0021) 07:23				
40	21:41 20:32	06:38 13 18:53 (B0021) 07:23				
41	04:31 20:32	19:07 13 18:53 (B0021) 07:23				
42	21:39 20:30	06:40 13 18:53 (B0021) 07:23				
43	04:33 20:30	19:04 13 18:53 (B0021) 07:23				
44	21:38 20:27	06:42 13 18:53 (B0021) 07:23				
45	04:35 20:27	19:02 13 18:53 (B0021) 07:23				
46	21:36 20:24	06:44 13 18:53 (B0021) 07:23				
47	04:37 20:22	19:59 13 18:53 (B0021) 07:23				
48	21:34 20:22	06:47 13 18:53 (B0021) 07:23				
49	04:39 20:22	18:56 13 18:53 (B0021) 07:23				
50	21:32 20:19	06:49 13 18:53 (B0021) 07:23				
51	04:41 20:19	18:53 13 18:53 (B0021) 07:23				
52	21:30 20:16	06:51 13 18:53 (B0021) 07:23				
53	04:43 20:16	18:50 13 18:53 (B0021) 07:23				
54	21:28 20:14	06:53 13 18:53 (B0021) 07:23				
55	04:44 20:14	18:48 13 18:53 (B0021) 07:23				
56	21:26 20:11	06:55 13 18:53 (B0021) 07:23				
57	04:46 20:11	18:45 13 18:53 (B0021) 07:23				
58	21:24 20:08	06:57 13 18:53 (B0021) 07:23				
59	04:48 20:08	18:42 13 18:53 (B0021) 07:23				
60	21:22 20:06	06:59 13 18:53 (B0021) 07:23				
61	04:50 20:03	18:39 13 18:53 (B0021) 07:23				
62	21:20 20:03					
Potential sun hours	538	474	386	321	241	207
Total, worst case	30	117	326	477	159	
Sun reduction	0,38	0,35	0,31	0,26	0,17	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,57	0,60	0,65	0,68	0,69	
Total reduction	0,22	0,21	0,21	0,18	0,12	
Total, real	7	25	67	84	19	

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SALDEFALL 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (923)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	18:57 (B0021) 19:09 (B0021)	05:11 20:44
2	08:43 15:24	08:02 16:26	15:20 (B0024) 17:31	16:39 (B0023) 19:40	18:55 (B0021) 19:09 (B0021)	20:44 21:47
3	08:42 15:26	08:00 16:28	15:18 (B0024) 17:34	16:36 (B0023) 19:42	18:54 (B0021) 19:10 (B0021)	20:46 21:48
4	08:42 15:27	07:57 16:30	15:16 (B0024) 17:36	16:34 (B0023) 19:45	18:53 (B0021) 19:09 (B0021)	20:47 21:50
5	08:41 15:28	07:55 16:33	15:16 (B0024) 17:38	16:32 (B0023) 19:47	18:53 (B0021) 19:10 (B0021)	20:46 21:51
6	08:41 15:30	07:53 16:35	15:14 (B0024) 17:40	16:32 (B0023) 19:49	18:53 (B0021) 19:09 (B0021)	20:45 21:52
7	08:40 15:32	07:51 16:37	15:14 (B0024) 17:43	16:31 (B0023) 19:51	18:53 (B0021) 19:08 (B0021)	20:45 21:53
8	08:39 15:33	07:49 16:40	15:13 (B0024) 17:45	16:30 (B0023) 19:53	18:54 (B0021) 19:08 (B0021)	20:44 21:55
9	08:38 15:35	07:46 16:42	15:13 (B0024) 17:47	16:29 (B0023) 19:56	18:55 (B0021) 19:06 (B0021)	20:42 21:56
10	08:38 15:40	07:44 16:49	15:13 (B0024) 17:54	16:29 (B0023) 20:02	18:58 (B0021) 19:02 (B0021)	20:40 21:57
11	08:37 15:38	07:42 16:47	15:13 (B0024) 17:52	16:29 (B0023) 20:00	19:02 (B0021) 21:04	20:41 21:58
12	08:36 15:40	07:39 16:49	15:13 (B0024) 17:54	16:29 (B0023) 20:02	19:02 (B0021) 21:04	20:41 21:58
13	08:34 15:42	07:37 16:52	15:13 (B0024) 17:56	16:29 (B0023) 20:04	19:02 (B0021) 21:10	20:40 21:59
14	08:33 15:44	07:35 16:54	15:13 (B0024) 17:58	16:30 (B0023) 20:07	19:30 (B0020) 19:36 (B0020)	20:39 22:00
15	08:32 15:46	07:32 16:56	15:14 (B0024) 18:01	16:30 (B0023) 20:09	19:27 (B0020) 19:38 (B0020)	20:39 22:01
16	08:31 15:48	07:30 16:59	15:15 (B0024) 18:03	16:33 (B0023) 20:11	19:26 (B0020) 19:39 (B0020)	20:37 22:02
17	08:30 15:50	07:27 17:01	15:16 (B0024) 18:05	16:34 (B0023) 20:13	19:26 (B0020) 19:40 (B0020)	20:35 22:02
18	08:28 15:52	07:25 17:03	15:17 (B0024) 18:07	16:38 (B0023) 20:15	19:25 (B0020) 19:39 (B0020)	20:33 22:03
19	08:27 15:54	07:22 17:06	15:19 (B0024) 18:09	17:33 (B0016) 20:18	19:25 (B0020) 19:40 (B0020)	20:31 22:03
20	08:25 15:56	07:20 17:08	15:22 (B0024) 18:12	17:32 (B0016) 20:20	19:25 (B0020) 19:39 (B0020)	20:31 22:03
21	08:24 15:58	07:17 17:11	15:31 (B0024) 18:14	17:42 (B0016) 20:22	19:39 (B0020) 19:38 (B0020)	20:24 22:04
22	08:22 16:01	07:15 17:13	05:59 18:16	17:34 (B0016) 20:24	19:26 (B0020) 19:37 (B0020)	20:26 22:04
23	08:20 16:03	07:12 17:15	05:56 18:18	17:35 (B0016) 20:26	19:29 (B0020) 19:35 (B0020)	20:24 22:04
24	08:19 16:05	07:09 17:17	05:53 18:20	17:41 (B0016) 20:29	19:35 (B0020) 21:30	20:22 22:04
25	08:17 16:07	07:07 17:20	05:50 18:23	05:29 20:31	21:32 21:34	22:04 22:04
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	21:39 21:35	22:04 22:04
27	08:13 16:12	07:02 17:24	05:45 18:27	05:21 20:35	21:37 21:37	22:04 22:04
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	21:37 21:39	22:04 22:04
29	08:10 16:16		06:39 19:31	05:16 20:40	21:39 21:40	22:04 22:03
30	08:08 16:19		06:36 19:34	05:13 20:42	21:40 21:42	22:03 22:03
31	08:06 16:21		06:34 19:36	18:59 (B0021) 19:07 (B0021)	21:42 21:44	22:03 22:03
Potential sun hours	228	263	366	429	515	539
Total, worst case		401	410	251		265
Sun reduction		0,16	0,22	0,42		0,43
Oper. time red.		0,99	0,99	0,99		0,99
Wind dir. red.		0,69	0,67	0,62		0,57
Total reduction		0,11	0,15	0,27		0,24
Total, real		45	62	67		65

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)

bruzaholm

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

2017-09-08 18:49/3.1.617

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (904)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January	February	March	April	May	June
1	08:43	08:04	06:56	06:31	05:11	04:10
	15:23	16:23	17:29	19:38	20:44	21:45
2	08:43	08:02	06:54	06:28	05:08	04:09
	15:24	16:26	17:31	19:40	20:46	21:47
3	08:42	08:00	06:51	06:25	19:08 (B0021)	05:06
	15:26	16:28	17:34	19:42	19:11 (B0021)	20:49
4	08:42	07:57	06:48	06:22	19:04 (B0021)	05:04
	15:27	16:30	17:36	19:45	10 19:14 (B0021)	20:51
5	08:41	07:55	06:46	06:20	19:03 (B0021)	05:01
	15:28	16:33	17:38	19:47	13 19:16 (B0021)	20:53
6	08:41	07:53	06:43	06:17	19:01 (B0021)	04:59
	15:30	16:35	17:40	19:49	16 19:17 (B0021)	20:55
7	08:40	07:51	06:40	06:14	19:00 (B0021)	04:57
	15:32	16:37	17:43	19:51	16 19:16 (B0021)	20:57
8	08:39	07:49	15:32 (B0024)	06:37	16:50 (B0023)	06:11
	15:33	16:40	11 15:43 (B0024)	17:45	11 17:01 (B0023)	19:53
9	08:38	07:46	15:30 (B0024)	06:35	16:47 (B0023)	06:09
	15:35	16:42	16 15:46 (B0024)	17:47	17 17:04 (B0023)	19:56
10	08:38	07:44	15:28 (B0024)	06:32	16:45 (B0023)	06:06
	15:37	16:45	19 15:47 (B0024)	17:49	20 17:05 (B0023)	19:58
11	08:37	07:42	15:28 (B0024)	06:29	16:45 (B0023)	06:03
	15:38	16:47	21 15:49 (B0024)	17:52	22 17:07 (B0023)	20:00
12	08:36	07:39	15:26 (B0024)	06:26	16:43 (B0023)	06:00
	15:40	16:49	24 15:50 (B0024)	17:54	24 17:07 (B0023)	20:02
13	08:34	07:37	15:26 (B0024)	06:24	16:42 (B0023)	05:58
	15:42	16:52	25 15:51 (B0024)	17:56	26 17:08 (B0023)	20:04
14	08:33	07:35	15:25 (B0024)	06:21	16:41 (B0023)	05:55
	15:44	16:54	26 15:51 (B0024)	17:58	27 17:08 (B0023)	20:07
15	08:32	07:32	15:25 (B0024)	06:18	16:41 (B0023)	05:52
	15:46	16:56	26 15:51 (B0024)	18:01	26 17:07 (B0023)	20:09
16	08:31	07:30	15:25 (B0024)	06:15	16:41 (B0023)	05:50
	15:48	16:59	27 15:52 (B0024)	18:03	27 17:08 (B0023)	20:11
17	08:30	07:27	15:25 (B0024)	06:13	16:41 (B0023)	05:47
	15:50	17:01	27 15:52 (B0024)	18:05	26 17:07 (B0023)	20:13
18	08:28	07:25	15:24 (B0024)	06:10	16:41 (B0023)	05:44
	15:52	17:03	27 15:51 (B0024)	18:07	26 17:07 (B0023)	20:15
19	08:27	07:22	15:25 (B0024)	06:07	16:41 (B0023)	05:42
	15:54	17:06	27 15:52 (B0024)	18:09	25 17:06 (B0023)	20:18
20	08:25	07:20	15:25 (B0024)	06:04	16:42 (B0023)	05:39
	15:56	17:08	26 15:51 (B0024)	18:12	25 17:42 (B0016)	20:20
21	08:24	07:17	15:26 (B0024)	06:01	16:42 (B0023)	05:36
	15:58	17:11	24 15:50 (B0024)	18:14	27 17:44 (B0016)	20:22
22	08:22	07:15	15:27 (B0024)	05:59	16:45 (B0023)	05:34
	16:01	17:13	23 15:50 (B0024)	18:16	26 17:47 (B0016)	20:24
23	08:20	07:12	15:28 (B0024)	05:56	16:47 (B0023)	05:31
	16:03	17:15	20 15:48 (B0024)	18:18	23 17:49 (B0016)	20:26
24	08:19	07:09	15:30 (B0024)	05:53	17:38 (B0016)	05:29
	16:05	17:17	16 15:46 (B0024)	18:20	11 17:49 (B0016)	20:29
25	08:17	07:07	15:33 (B0024)	05:50	17:39 (B0016)	05:26
	16:07	17:20	11 15:44 (B0024)	18:23	9 17:48 (B0016)	20:31
26	08:15	07:04		05:47	17:41 (B0016)	05:23
	16:09	17:22		18:25	4 17:45 (B0016)	20:33
27	08:13	07:02		05:45		05:21
	16:12	17:24		18:27		20:35
28	08:12	06:59		05:42		05:18
	16:14	17:27		18:29		20:38
29	08:10			06:39		05:16
	16:16			19:31		20:40
30	08:08			06:36		05:13
	16:19			19:34		20:42
31	08:06			06:34		
	16:21			19:36		
Potential sun hours	228	263	366	429	515	539
Total, worst case			396			122
Sun reduction			0,16	0,22		0,43
Oper. time red.			0,99	0,99		0,99
Wind dir. red.			0,69	0,66		0,56
Total reduction			0,11	0,15		0,24
Total, real			44	59		29

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: SÄLDEFALL 1:8>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (904)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July			August			September			October			November			December	
1	04:03		21:16 (B0018)	04:53			05:58		19:00 (B0021)	07:01		17:22 (B0023)	07:10		14:58 (B0024)	08:16	
	22:02	3	21:19 (B0018)	21:18			20:00	14	19:14 (B0021)	18:36	25	17:47 (B0023)	16:15	19	15:17 (B0024)	15:21	
2	04:04		21:17 (B0018)	04:55			06:00		18:59 (B0021)	07:04		17:22 (B0023)	07:13		15:00 (B0024)	08:17	
	22:02	2	21:19 (B0018)	21:16			19:57	15	19:14 (B0021)	18:34	23	17:45 (B0023)	16:13	15	15:15 (B0024)	15:20	
3	04:05		21:17 (B0018)	04:57			06:02		18:58 (B0021)	07:06		17:23 (B0023)	07:15		15:02 (B0024)	08:19	
	22:01	2	21:19 (B0018)	21:13			19:55	16	19:14 (B0021)	18:31	21	17:44 (B0023)	16:10	10	15:12 (B0024)	15:19	
4	04:06			04:59			06:04		18:58 (B0021)	07:08		17:24 (B0023)	07:17			08:21	
	22:01			21:11			19:52	16	19:14 (B0021)	18:28	18	17:42 (B0023)	16:08			15:18	
5	04:07			05:01			06:07		18:57 (B0021)	07:10		17:26 (B0023)	07:20			08:22	
	22:00			21:09			19:49	17	19:14 (B0021)	18:25	14	17:40 (B0023)	16:06			15:17	
6	04:08			05:03			06:09		18:58 (B0021)	07:12		17:29 (B0023)	07:22			08:24	
	21:59			21:07			19:46	15	19:13 (B0021)	18:23	7	17:36 (B0023)	16:04			15:16	
7	04:10			05:05			06:11		18:58 (B0021)	07:14			07:24			08:26	
	21:58			21:04			19:44	13	19:11 (B0021)	18:20			16:01			15:15	
8	04:11			05:07			06:13		18:59 (B0021)	07:17			07:26			08:27	
	21:57			21:02			19:41	10	19:09 (B0021)	18:17			15:59			15:15	
9	04:12			05:09			06:15		19:01 (B0021)	07:19			07:29			08:29	
	21:56			21:00			19:38	5	19:06 (B0021)	18:14			15:57			15:14	
10	04:14			05:11			06:17			07:21			07:31			08:30	
	21:55			20:57			19:35			18:12			15:55			15:14	
11	04:15			05:13			06:19			07:23			07:33			08:31	
	21:54			20:55			19:32			18:09			15:53			15:13	
12	04:16			05:15			06:21			07:25			07:36			08:33	
	21:53			20:52			19:30			18:06			15:51			15:13	
13	04:18			05:18			06:23			07:27			07:38			08:34	
	21:51			20:50			19:27			18:03			15:49			15:13	
14	04:19			05:20			06:25			07:30			07:40			08:35	
	21:50			20:47			19:24			18:01			15:47			15:13	
15	04:21			05:22			06:28			07:32			07:42			08:36	
	21:49			20:45			19:21			17:58			15:45			15:12	
16	04:23			05:24			06:30			07:34		16:08 (B0024)	07:45			08:37	
	21:47			20:42			19:18			17:55	5	16:13 (B0024)	15:43			15:12	
17	04:24			05:26		19:41 (B0020)	06:32			07:36		16:03 (B0024)	07:47			08:38	
	21:46			20:40	7	19:48 (B0020)	19:16			17:53	13	16:16 (B0024)	15:41			15:12	
18	04:26			05:28		19:39 (B0020)	06:34		18:27 (B0016)	07:39		16:01 (B0024)	07:49			08:39	
	21:44			20:37	11	19:50 (B0020)	19:13		8	18:35 (B0016)	17:50	18	16:19 (B0024)	15:39		15:13	
19	04:28			05:30		19:38 (B0020)	06:36			18:25 (B0016)	07:41		15:59 (B0024)	07:51		08:40	
	21:43			20:35	13	19:51 (B0020)	19:10		11	18:36 (B0016)	17:48	21	16:20 (B0024)	15:38		15:13	
20	04:29			05:33		19:37 (B0020)	06:38			17:33 (B0023)	07:43		15:57 (B0024)	07:53		08:40	
	21:41			20:32	14	19:51 (B0020)	19:07		23	18:36 (B0016)	17:45	23	16:20 (B0024)	15:36		15:13	
21	04:31			05:35		19:36 (B0020)	06:40			17:31 (B0023)	07:45		15:57 (B0024)	07:56		08:41	
	21:39			20:30	15	19:51 (B0020)	19:04		26	18:34 (B0016)	17:42	24	16:21 (B0024)	15:34		15:13	
22	04:33			05:37		19:36 (B0020)	06:42			17:29 (B0023)	07:48		15:55 (B0024)	07:58		08:42	
	21:38			20:27	15	19:51 (B0020)	19:02		26	18:31 (B0016)	17:40	26	16:21 (B0024)	15:33		15:14	
23	04:35			05:39		19:36 (B0020)	06:44			17:27 (B0023)	07:50		15:55 (B0024)	08:00		08:42	
	21:36			20:24	14	19:50 (B0020)	18:59		26	18:28 (B0016)	17:37	27	16:22 (B0024)	15:31		15:14	
24	04:37			05:41		19:36 (B0020)	06:47			17:25 (B0023)	07:52		15:55 (B0024)	08:02		08:42	
	21:34			20:22	13	19:49 (B0020)	18:56		24	17:49 (B0023)	17:35	27	16:22 (B0024)	15:30		15:15	
25	04:39			05:43		19:37 (B0020)	06:49			17:24 (B0023)	06:54		14:55 (B0024)	08:04		08:43	
	21:32			20:19	10	19:47 (B0020)	18:53		25	17:49 (B0023)	16:32	27	15:22 (B0024)	15:28		15:16	
26	04:41			05:45		19:38 (B0020)	06:51			17:23 (B0023)	06:57		14:54 (B0024)	08:06		08:43	
	21:30			20:16	7	19:45 (B0020)	18:50		26	17:49 (B0023)	16:30	27	15:21 (B0024)	15:27		15:17	
27	04:43			05:47			06:53			17:22 (B0023)	06:59		14:55 (B0024)	08:08		08:43	
	21:28			20:14			18:47		27	17:49 (B0023)	16:27	27	15:22 (B0024)	15:25		15:17	
28	04:44			05:50			06:55			17:22 (B0023)	07:01		14:55 (B0024)	08:10		08:43	
	21:26			20:11			18:45		26	17:48 (B0023)	16:25	26	15:21 (B0024)	15:24		15:18	
29	04:46			05:52			06:57			17:22 (B0023)	07:03		14:56 (B0024)	08:12		08:43	
	21:24			20:08			18:42		27	17:49 (B0023)	16:22	25	15:21 (B0024)	15:23		15:19	
30	04:48			05:54		19:04 (B0021)	06:59			17:22 (B0023)	07:06		14:56 (B0024)	08:14		08:43	
	21:22			20:06	8	19:12 (B0021)	18:39		26	17:48 (B0023)	16:20	23	15:19 (B0024)	15:22		15:20	
31	04:50			05:56		19:02 (B0021)					07:08		14:57 (B0024)			08:43	
	21:20			20:03	11	19:13 (B0021)					16:18	22	15:19 (B0024)			15:21	
Potential sun hours	538			474			386			321			241			207	
Total, worst case		7			138			422			469			44			
Sun reduction		0,38			0,35			0,31			0,26			0,17			
Oper. time red.		0,99			0,99			0,99			0,99			0,99			
Wind dir. red.		0,56			0,60			0,65			0,68			0,69			
Total reduction		0,22			0,21			0,20			0,18			0,12			
Total, real		2			29			86			83			5			

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VASSEMÅLA 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (828)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January		February		March	April	May	June
1	08:43	09:51 (B0018)	08:04	14:48 (B0006)	06:57	06:31	05:11	04:10
	15:23	39 14:24 (B0007)	16:23	13 15:01 (B0006)	17:29	19:38	20:44	21:46
2	08:43	09:53 (B0018)	08:02	14:52 (B0006)	06:54	06:28	05:09	04:09
	15:24	36 14:24 (B0007)	16:26	6 14:58 (B0006)	17:31	19:40	20:47	21:47
3	08:43	10:08 (B0017)	08:00		06:51	06:25	05:06	04:08
	15:26	33 14:25 (B0007)	16:28		17:34	19:43	20:49	21:49
4	08:42	10:09 (B0017)	07:58		06:48	06:23	05:04	04:07
	15:27	31 14:25 (B0007)	16:30		17:36	19:45	20:51	21:50
5	08:42	10:09 (B0017)	07:56		06:46	06:20	05:01	04:06
	15:28	31 14:25 (B0007)	16:33		17:38	19:47	20:53	21:51
6	08:41	10:11 (B0017)	07:53		06:43	06:17	04:59	04:05
	15:30	29 14:26 (B0007)	16:35		17:41	19:49	20:55	21:53
7	08:40	10:12 (B0017)	07:51		06:40	06:14	04:57	04:04
	15:32	30 14:47 (B0006)	16:38		17:43	19:51	20:58	21:54
8	08:40	10:14 (B0017)	07:49		06:38	06:11	04:54	04:03
	15:33	29 14:49 (B0006)	16:40		17:45	19:54	21:00	21:55
9	08:39	14:10 (B0007)	07:47		06:35	06:09	04:52	04:02
	15:35	27 14:51 (B0006)	16:42		17:47	19:56	21:02	21:56
10	08:38	14:11 (B0007)	07:44	16:08 (B0002)	06:32	06:06	04:50	04:01
	15:37	28 14:53 (B0006)	16:45	3 16:11 (B0002)	17:50	19:58	21:04	21:57
11	08:37	14:11 (B0007)	07:42	16:07 (B0002)	06:29	06:03	04:48	04:01
	15:38	30 14:55 (B0006)	16:47	6 16:13 (B0002)	17:52	20:00	21:06	21:58
12	08:36	14:13 (B0007)	07:40	16:07 (B0002)	06:27	06:01	04:45	04:00
	15:40	31 14:57 (B0006)	16:49	9 16:16 (B0002)	17:54	20:02	21:08	21:59
13	08:35	14:14 (B0007)	07:37	16:08 (B0002)	06:24	05:58	04:43	04:00
	15:42	32 14:59 (B0006)	16:52	11 16:19 (B0002)	17:56	20:05	21:10	22:00
14	08:34	14:15 (B0007)	07:35	16:09 (B0002)	06:21	05:55	04:41	03:59
	15:44	32 15:00 (B0006)	16:54	10 16:19 (B0002)	17:59	20:07	21:12	22:01
15	08:32	14:16 (B0007)	07:32	16:11 (B0002)	06:18	05:52	04:39	03:59
	15:46	30 15:00 (B0006)	16:57	7 16:18 (B0002)	18:01	20:09	21:14	22:01
16	08:31	14:20 (B0007)	07:30		06:16	05:50	04:37	03:59
	15:48	26 15:02 (B0006)	16:59		18:03	20:11	21:17	22:02
17	08:30	14:39 (B0006)	07:27		06:13	05:47	04:35	03:58
	15:50	23 15:02 (B0006)	17:01		18:05	20:14	21:19	22:03
18	08:29	14:39 (B0006)	07:25		06:10	05:44	04:33	03:58
	15:52	24 15:03 (B0006)	17:04		18:07	20:16	21:21	22:03
19	08:27	14:40 (B0006)	07:22		06:07	05:42	04:31	03:58
	15:54	24 15:04 (B0006)	17:06		18:10	20:18	21:23	22:04
20	08:26	14:40 (B0006)	07:20		06:04	05:39	04:29	03:58
	15:56	24 15:04 (B0006)	17:08		18:12	20:20	21:25	22:04
21	08:24	14:40 (B0006)	07:17		06:02	05:36	04:27	03:58
	15:58	25 15:05 (B0006)	17:11		18:14	20:22	21:26	22:04
22	08:22	14:40 (B0006)	07:15		05:59	05:34	04:26	03:59
	16:01	25 15:05 (B0006)	17:13		18:16	20:25	21:28	22:04
23	08:21	14:40 (B0006)	07:12		05:56	05:31	04:24	03:59
	16:03	25 15:05 (B0006)	17:15		18:18	20:27	21:30	22:05
24	08:19	14:41 (B0006)	07:10		05:53	05:29	04:22	03:59
	16:05	25 15:06 (B0006)	17:18		18:21	20:29	21:32	22:05
25	08:17	14:41 (B0006)	07:07		05:50	05:26	04:20	04:00
	16:07	25 15:06 (B0006)	17:20		18:23	20:31	21:34	22:05
26	08:16	14:42 (B0006)	07:04		05:48	05:23	04:19	04:00
	16:10	24 15:06 (B0006)	17:22		18:25	20:33	21:36	22:05
27	08:14	14:43 (B0006)	07:02		05:45	05:21	04:17	04:01
	16:12	23 15:06 (B0006)	17:25		18:27	20:36	21:37	22:04
28	08:12	14:43 (B0006)	06:59		05:42	05:18	04:16	04:01
	16:14	22 15:05 (B0006)	17:27		18:29	20:38	21:39	22:04
29	08:10	14:44 (B0006)			06:39	05:16	04:14	04:02
	16:16	20 15:04 (B0006)			19:32	20:40	21:41	22:04
30	08:08	14:45 (B0006)			06:36	05:13	04:13	04:03
	16:19	19 15:04 (B0006)			19:34	20:42	21:42	22:03
31	08:06	14:47 (B0006)			06:34		04:12	
	16:21	16 15:03 (B0006)			19:36		21:44	
Potential sun hours	228		262		366	429	515	539
Total, worst case	838		65					
Sun reduction	0,19		0,16					
Oper. time red.	0,99		0,99					
Wind dir. red.	0,68		0,69					
Total reduction	0,12		0,11					
Total, real	104		7					

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VASSEMÅLA 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (828)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 15:36 (B0002)
2	04:04 22:02	04:55 21:16	06:00 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	07:22 16:04	08:25 15:16
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:24 16:02	08:26 15:15
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	07:27 15:59	08:28 15:15
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	08:29 15:14
10	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	07:31 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	07:34 15:53	08:32 15:13
12	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	07:36 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:40 15:47	08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:43 15:45	08:36 15:12
16	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	07:45 15:43	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	07:47 15:41	08:38 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	07:49 15:40	08:39 15:13
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:54 15:36	08:41 15:13
21	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	07:56 15:34	08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	08:00 15:31	08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	06:55 16:32	08:04 15:28	08:43 15:16
26	04:41 21:31	05:45 20:17	06:51 18:50	06:57 16:30	08:06 15:27	08:43 15:16
27	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:27	08:08 15:25	08:44 15:17
28	04:44 21:27	05:50 20:11	06:55 18:45	07:01 16:25	08:10 15:24	08:44 15:18
29	04:46 21:25	05:52 20:09	06:57 18:42	07:04 16:22	08:12 15:23	08:44 15:19
30	04:48 21:22	05:54 20:06	07:00 18:39	07:06 16:20	08:14 15:22	08:44 15:20
31	04:50 21:20	05:56 20:03		07:08 16:18	08:16 15:21	08:44 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case				40	521	1256
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,69	0,64
Total reduction				0,18	0,12	0,08
Total, real				7	61	104

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		

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m Shadow receptor: VASSEMÅLA 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (842)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

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

607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

		January		February		March	April	May	June
1	08:43		09:46 (B0018)	08:04	14:46 (B0006)	06:57	06:31	05:11	04:10
	15:23	46	14:23 (B0007)	16:23	15	15:01 (B0006)	17:29	19:38	20:44
2	08:43		09:47 (B0018)	08:02		14:50 (B0006)	06:54	06:28	05:09
	15:24	45	14:23 (B0007)	16:26	9	14:59 (B0006)	17:31	19:40	20:47
3	08:43		09:48 (B0018)	08:00			06:51	06:25	05:06
	15:26	44	14:24 (B0007)	16:28			17:34	19:43	20:49
4	08:42		09:50 (B0018)	07:58			06:48	06:23	05:04
	15:27	38	14:24 (B0007)	16:30			17:36	19:45	20:51
5	08:42		10:04 (B0017)	07:56			06:46	06:20	05:01
	15:28	33	14:24 (B0007)	16:33			17:38	19:47	20:53
6	08:41		10:05 (B0017)	07:53			06:43	06:17	04:59
	15:30	34	14:45 (B0006)	16:35			17:41	19:49	20:55
7	08:40		10:06 (B0017)	07:51			06:40	06:14	04:57
	15:32	37	14:47 (B0006)	16:38			17:43	19:51	20:58
8	08:40		10:07 (B0017)	07:49			06:38	06:11	04:54
	15:33	37	14:49 (B0006)	16:40			17:45	19:54	21:00
9	08:39		10:09 (B0017)	07:47			06:35	06:09	04:52
	15:35	37	14:51 (B0006)	16:42			17:47	19:56	21:02
10	08:38		10:11 (B0017)	07:44		16:08 (B0002)	06:32	06:06	04:50
	15:37	35	14:53 (B0006)	16:45	3	16:11 (B0002)	17:50	19:58	21:04
11	08:37		14:10 (B0007)	07:42		16:08 (B0002)	06:29	06:03	04:48
	15:38	31	14:55 (B0006)	16:47	5	16:13 (B0002)	17:52	20:00	21:06
12	08:36		14:11 (B0007)	07:40		16:07 (B0002)	06:27	06:01	04:45
	15:40	33	14:57 (B0006)	16:49	9	16:16 (B0002)	17:54	20:02	21:08
13	08:35		14:13 (B0007)	07:37		16:08 (B0002)	06:24	05:58	04:43
	15:42	33	14:59 (B0006)	16:52	11	16:19 (B0002)	17:56	20:05	21:10
14	08:34		14:13 (B0007)	07:35		16:09 (B0002)	06:21	05:55	04:41
	15:44	33	14:59 (B0006)	16:54	10	16:19 (B0002)	17:59	20:07	21:12
15	08:33		14:15 (B0007)	07:32		16:11 (B0002)	06:18	05:52	04:39
	15:46	31	15:00 (B0006)	16:57	8	16:19 (B0002)	18:01	20:09	21:14
16	08:31		14:18 (B0007)	07:30			06:16	05:50	04:37
	15:48	27	15:01 (B0006)	16:59			18:03	20:11	21:17
17	08:30		14:38 (B0006)	07:27			06:13	05:47	04:35
	15:50	23	15:01 (B0006)	17:01			18:05	20:14	21:19
18	08:29		14:37 (B0006)	07:25			06:10	05:44	04:33
	15:52	25	15:02 (B0006)	17:04			18:07	20:16	21:21
19	08:27		14:38 (B0006)	07:22			06:07	05:42	04:31
	15:54	25	15:03 (B0006)	17:06			18:10	20:18	21:23
20	08:26		14:38 (B0006)	07:20			06:04	05:39	04:29
	15:56	26	15:04 (B0006)	17:08			18:12	20:20	21:25
21	08:24		14:38 (B0006)	07:17			06:02	05:36	04:27
	15:58	26	15:04 (B0006)	17:11			18:14	20:22	21:26
22	08:22		14:39 (B0006)	07:15			05:59	05:34	04:26
	16:01	25	15:04 (B0006)	17:13			18:16	20:25	21:28
23	08:21		14:39 (B0006)	07:12			05:56	05:31	04:24
	16:03	26	15:05 (B0006)	17:15			18:18	20:27	21:30
24	08:19		14:39 (B0006)	07:10			05:53	05:29	04:22
	16:05	26	15:05 (B0006)	17:18			18:21	20:29	21:32
25	08:17		14:40 (B0006)	07:07			05:50	05:26	04:20
	16:07	25	15:05 (B0006)	17:20			18:23	20:31	21:34
26	08:16		14:40 (B0006)	07:04			05:48	05:23	04:19
	16:10	25	15:05 (B0006)	17:22			18:25	20:33	21:36
27	08:14		14:41 (B0006)	07:02			05:45	05:21	04:17
	16:12	24	15:05 (B0006)	17:25			18:27	20:36	21:37
28	08:12		14:41 (B0006)	06:59			05:42	05:18	04:16
	16:14	23	15:04 (B0006)	17:27			18:29	20:38	21:39
29	08:10		14:42 (B0006)				06:39	05:16	04:14
	16:16	22	15:04 (B0006)				19:32	20:40	21:41
30	08:08		14:44 (B0006)				06:36	05:13	04:13
	16:19	19	15:03 (B0006)				19:34	20:42	21:42
31	08:06		14:45 (B0006)				06:34		04:12
	16:21	18	15:03 (B0006)				19:36		21:44
Potential sun hours		228		262			366	429	515
Total, worst case		932		70					
Sun reduction		0,19		0,16					
Oper. time red.		0,99		0,99					
Wind dir. red.		0,68		0,69					
Total reduction		0,12		0,11					
Total, real		115		8					

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VASSEMÅLA 1:1>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (842)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:53 21:18	05:58 20:00	07:02 18:37	07:11 16:15	08:16 13:52 (B0007)
2	04:04 22:02	04:55 21:16	06:00 19:58	07:04 18:34	2 15:37 (B0002) 07:13 16:13	15:21 08:18 14:37 (B0006)
3	04:05 22:02	04:57 21:14	06:02 19:55	07:06 18:31	15:39 (B0002) 07:15 16:11	31 14:37 (B0006) 08:20 15:19
4	04:06 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:08	34 14:35 (B0006) 08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	15:17 07:20	37 14:32 (B0006) 08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:47	07:12 18:23	15:17 16:04	37 14:32 (B0006) 08:25 15:16
7	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	15:17 16:02	34 14:31 (B0006) 08:26 15:15
8	04:11 21:58	05:07 21:02	06:13 19:41	07:17 18:17	15:17 16:02	33 14:11 (B0007) 08:28 15:15
9	04:12 21:57	05:09 21:00	06:15 19:38	07:19 18:14	15:17 15:59	39 14:12 (B0007) 08:29 15:15
10	04:13 21:56	05:11 20:58	06:17 19:35	07:21 18:12	14:20 (B0006) 15:57	41 14:12 (B0007) 08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:33	07:23 18:09	10 14:30 (B0006) 07:31	45 14:13 (B0007) 08:32 15:14
12	04:16 21:53	05:16 20:53	06:21 19:30	07:26 18:06	15 14:33 (B0006) 07:34	46 14:13 (B0007) 08:33 15:13
13	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	18 14:34 (B0006) 07:36	47 14:14 (B0007) 08:33 15:13
14	04:19 21:51	05:20 20:48	06:26 19:24	07:30 18:01	20 14:35 (B0006) 07:38	48 14:14 (B0007) 08:34 15:13
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	22 14:36 (B0006) 07:40	49 14:14 (B0007) 08:35 15:12
16	04:23 21:48	05:24 20:43	06:30 19:19	07:34 17:56	23 14:37 (B0006) 07:43	50 14:15 (B0007) 08:36 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:37 17:53	24 14:37 (B0006) 07:45	50 14:15 (B0007) 08:37 15:12
18	04:26 21:45	05:28 20:38	06:34 19:13	07:39 17:50	25 14:38 (B0006) 07:47	50 14:15 (B0007) 08:38 15:12
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	25 14:38 (B0006) 07:49	51 14:16 (B0007) 08:39 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	26 14:39 (B0006) 07:52	51 14:17 (B0007) 08:40 15:13
21	04:31 21:40	05:35 20:30	06:40 19:05	07:46 17:42	26 14:39 (B0006) 07:54	52 14:17 (B0007) 08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	26 14:40 (B0006) 07:58	52 14:18 (B0007) 08:42 15:14
23	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:37	25 14:40 (B0006) 08:00	52 14:18 (B0007) 08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	25 14:40 (B0006) 08:02	51 14:18 (B0007) 08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	07:55 16:32	24 14:40 (B0006) 08:04	51 14:18 (B0007) 08:44 15:16
26	04:41 21:31	05:45 20:17	06:51 18:50	07:57 16:30	24 14:40 (B0006) 08:06	51 14:20 (B0007) 08:45 15:16
27	04:43 21:29	05:48 20:14	06:53 18:48	07:59 16:27	27 14:39 (B0006) 08:08	51 14:20 (B0007) 08:46 15:17
28	04:44 21:27	05:50 20:11	06:55 18:45	08:01 16:25	31 14:40 (B0006) 08:10	52 14:21 (B0007) 08:47 15:18
29	04:46 21:25	05:52 20:09	06:57 18:42	08:03 16:22	32 14:39 (B0006) 08:12	49 14:21 (B0007) 08:48 15:19
30	04:48 21:22	05:54 20:06	07:00 18:39	08:06 16:20	33 14:39 (B0006) 08:14	50 14:21 (B0007) 08:49 15:20
31	04:50 21:20	05:56 20:03	07:08 16:18	08:08 15:42 (B0002)	33 14:38 (B0006) 08:16	49 14:22 (B0007) 08:50 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case				45	542	1420
Sun reduction				0,26	0,17	0,13
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,69	0,69	0,64
Total reduction				0,18	0,12	0,08
Total, real				8	63	117

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:10>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (869)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	15:28 (B0021) 17:29	06:31 19:38	18:57 (B0025) 20:44	19:43 (B0017) 21:45
2	08:43 15:24	08:02 16:26	15:29 (B0021) 17:31	06:28 19:40	18:57 (B0025) 20:46	19:45 (B0017) 21:47
3	08:42 15:26	08:00 16:28	15:28 (B0021) 17:34	06:25 19:42	18:57 (B0025) 20:49	19:46 (B0017) 21:48
4	08:42 15:27	07:57 16:30	15:29 (B0021) 17:36	06:22 19:45	18:58 (B0025) 20:51	19:51 (B0017) 21:50
5	08:41 15:28	07:55 16:33	15:30 (B0021) 17:38	06:20 19:47	18:59 (B0025) 20:53	19:51 (B0017) 21:51
6	08:41 15:30	07:53 16:35	15:30 (B0021) 17:40	06:17 19:49	19:01 (B0025) 20:55	19:51 (B0017) 21:52
7	08:40 15:31	07:51 16:37	15:32 (B0021) 17:43	06:14 19:51	19:08 (B0018) 20:57	19:51 (B0017) 21:54
8	08:39 15:33	07:49 16:40	15:34 (B0021) 17:45	06:11 19:53	19:07 (B0018) 20:59	19:51 (B0017) 21:55
9	08:39 15:35	07:46 16:42	15:42 (B0021) 17:45	06:09 19:56	19:05 (B0018) 21:02	19:51 (B0017) 21:56
10	08:38 15:37	07:44 16:45	15:45 (B0021) 17:49	06:06 19:58	19:04 (B0018) 21:04	19:51 (B0017) 21:57
11	08:37 15:38	07:42 16:47	15:46 (B0021) 17:52	06:03 20:00	19:04 (B0018) 21:06	19:51 (B0017) 21:58
12	08:36 15:40	07:39 16:49	15:47 (B0021) 17:54	06:00 20:02	19:03 (B0018) 21:08	19:51 (B0017) 21:59
13	08:35 15:42	07:37 16:52	15:48 (B0021) 17:56	05:58 20:04	19:02 (B0018) 21:10	19:51 (B0017) 22:00
14	08:33 15:44	07:35 16:54	15:49 (B0021) 17:58	05:55 20:07	19:03 (B0018) 21:12	19:51 (B0017) 22:00
15	08:32 15:46	07:32 16:56	15:50 (B0021) 18:01	05:52 20:09	19:02 (B0018) 21:14	19:51 (B0017) 22:01
16	08:31 15:48	07:30 16:59	16:24 (B0020) 18:03	05:50 20:11	19:02 (B0018) 21:16	19:51 (B0017) 22:02
17	08:30 15:50	07:27 17:01	16:21 (B0020) 18:05	05:47 20:13	19:04 (B0018) 21:18	19:51 (B0017) 22:02
18	08:28 15:52	07:25 17:03	16:20 (B0020) 18:07	17:34 (B0019) 20:16	19:04 (B0018) 21:20	19:51 (B0017) 22:03
19	08:27 15:54	07:22 17:06	16:19 (B0020) 18:10	17:32 (B0019) 20:18	19:06 (B0018) 21:22	19:51 (B0017) 22:03
20	08:25 15:56	07:20 17:08	16:18 (B0020) 18:12	17:31 (B0019) 20:20	19:09 (B0018) 21:24	19:51 (B0017) 22:04
21	08:24 15:58	07:17 17:11	16:17 (B0020) 18:14	17:30 (B0019) 20:22	19:31 (B0012) 21:26	19:51 (B0017) 22:04
22	08:22 16:01	07:15 17:13	16:18 (B0020) 18:16	17:30 (B0019) 20:24	19:33 (B0012) 21:28	19:51 (B0017) 22:04
23	08:21 16:03	07:12 17:15	16:18 (B0020) 18:18	17:30 (B0019) 20:27	19:43 (B0017) 21:30	19:51 (B0017) 22:04
24	08:19 16:05	07:09 17:17	16:18 (B0020) 18:21	17:30 (B0019) 20:29	19:42 (B0017) 21:32	19:51 (B0017) 22:04
25	08:17 16:07	07:07 17:20	16:20 (B0020) 18:23	17:31 (B0019) 20:31	19:41 (B0017) 21:34	19:51 (B0017) 22:04
26	08:15 16:09	07:04 17:22	16:21 (B0020) 18:25	17:33 (B0019) 20:33	19:41 (B0017) 21:35	19:51 (B0017) 22:04
27	08:13 16:12	07:02 17:24	16:31 (B0020) 18:27	17:40 (B0019) 20:35	19:41 (B0017) 21:37	19:51 (B0017) 22:04
28	08:12 16:14	06:59 17:27	16:32 (B0020) 18:29	17:44 (B0019) 20:38	19:58 (B0017) 21:39	19:51 (B0017) 22:04
29	08:10 16:16	15:39 (B0021) 17:29	16:33 (B0020) 18:32	19:01 (B0025) 20:40	19:41 (B0017) 21:41	19:51 (B0017) 22:04
30	08:08 16:19	15:29 (B0021) 17:31	16:34 (B0020) 18:36	19:02 (B0025) 20:42	19:57 (B0017) 21:43	19:51 (B0017) 22:04
31	08:06 16:21	15:28 (B0021) 17:33	16:35 (B0020) 18:38	19:04 (B0025) 20:44	19:58 (B0017) 21:45	19:51 (B0017) 22:04
Potential sun hours	228	262	366	429	515	539
Total, worst case	46	261	116	544	26	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,69	0,65	0,62	0,60	
Total reduction	0,13	0,11	0,15	0,26	0,32	
Total, real	6	29	17	143	8	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:10>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (869)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:03 (B0018) 18:36	07:10 16:15	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	19:03 (B0018) 18:34	07:13 16:13	08:17 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:03 (B0018) 18:31	07:15 16:10	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	19:04 (B0018) 18:28	07:17 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:05 (B0018) 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	18:57 (B0025) 18:23	07:22 16:04	08:24 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	18:54 (B0025) 18:20	07:24 16:01	08:26 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	18:52 (B0025) 18:17	07:27 15:59	08:27 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	18:51 (B0025) 18:14	07:29 15:57	08:29 15:14
10	04:13 21:55	05:11 20:57	06:17 20:01 (B0017)	18:50 (B0025) 18:12	07:31 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 20:03 (B0017)	18:50 (B0025) 18:09	07:33 15:53	08:31 15:13
12	04:16 21:53	05:15 20:53	06:21 20:04 (B0017)	18:50 (B0025) 18:06	07:36 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 20:05 (B0017)	18:50 (B0025) 18:03	07:38 15:49	08:34 15:13
14	04:19 21:50	05:20 20:48	06:25 20:05 (B0017)	18:51 (B0025) 18:01	07:40 15:47	08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 20:05 (B0017)	18:53 (B0025) 17:58	07:42 15:45	08:36 15:12
16	04:23 21:47	05:24 20:43	06:30 20:05 (B0017)	17:55 17:03 (B0020)	07:45 15:43	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 20:05 (B0017)	18:22 (B0019) 17:53	07:47 15:41	08:38 15:12
18	04:26 21:44	05:28 20:37	06:34 20:05 (B0017)	18:19 (B0019) 17:50	07:49 15:39	08:39 15:13
19	04:28 21:43	05:30 20:35	06:36 20:02 (B0017)	18:17 (B0019) 17:48	07:51 15:38	08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 20:00 (B0017)	18:17 (B0019) 17:45	07:53 15:36	08:40 15:13
21	04:31 21:39	05:35 20:30	06:40 19:57 (B0017)	18:16 (B0019) 17:42	07:56 15:34	08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:55 (B0017)	18:15 (B0019) 17:40	07:58 15:33	08:42 15:14
23	04:35 21:36	05:39 20:24	06:44 19:45 (B0012)	18:15 (B0019) 17:37	08:00 15:31	08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 19:45 (B0012)	18:15 (B0019) 17:35	08:02 15:30	08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 19:08 (B0018)	18:16 (B0019) 16:32	08:04 15:28	08:43 15:16
26	04:41 21:30	05:45 20:16	06:51 19:06 (B0018)	18:17 (B0019) 16:30	08:06 15:27	08:43 15:16
27	04:42 21:28	05:47 20:14	06:53 19:05 (B0018)	18:19 (B0019) 16:27	08:08 15:25	08:43 15:17
28	04:44 21:26	05:50 20:11	06:55 19:04 (B0018)	18:19 (B0018) 16:25	08:10 15:24	08:43 15:18
29	04:46 21:24	05:52 20:08	06:57 19:04 (B0018)	18:19 (B0018) 16:22	08:12 15:23	08:43 15:19
30	04:48 21:22	05:54 20:06	06:59 19:03 (B0018)	18:19 (B0018) 16:20	08:14 15:22	08:43 15:20
31	04:50 21:20	05:56 20:03	18:39 19:03 (B0018)	18:19 (B0019) 16:17	08:16 15:21	08:43 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		408	286	143	164	
Sun reduction		0,35	0,31	0,26	0,17	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,61	0,64	0,69	0,69	
Total reduction		0,22	0,20	0,18	0,12	
Total, real		88	57	26	19	

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:10>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (921)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January			February			March			April			May			June		
1	08:43			08:04	15:32 (B0021)	06:56			06:31	18:58 (B0025)	05:11			19:44 (B0017)	04:10			
	15:23			16:23	15	15:47 (B0021)	17:29		19:38	11	19:09 (B0025)	20:44	11	19:55 (B0017)	21:45			
2	08:43			08:02		15:33 (B0021)	06:54		06:28		18:58 (B0025)	05:08		19:46 (B0017)	04:09			
	15:24			16:26	16	15:49 (B0021)	17:31		19:40	13	19:11 (B0025)	20:46	7	19:53 (B0017)	21:47			
3	08:42			08:00		15:32 (B0021)	06:51		06:25		18:58 (B0025)	05:06			04:08			
	15:26			16:28	17	15:49 (B0021)	17:34		19:42	13	19:11 (B0025)	20:49			21:48			
4	08:42			07:57		15:33 (B0021)	06:48		06:22		18:59 (B0025)	05:04			04:07			
	15:27			16:30	16	15:49 (B0021)	17:36		19:45	11	19:10 (B0025)	20:51			21:50			
5	08:41			07:55		15:33 (B0021)	06:46		06:20		19:00 (B0025)	05:01			04:06			
	15:28			16:33	17	15:50 (B0021)	17:38		19:47	9	19:09 (B0025)	20:53			21:51			
6	08:41			07:53		15:33 (B0021)	06:43		06:17		19:02 (B0025)	04:59			04:05			
	15:30			16:35	16	15:49 (B0021)	17:40		19:49	10	19:19 (B0018)	20:55			21:52			
7	08:40			07:51		15:35 (B0021)	06:40		06:14		19:09 (B0018)	04:57			04:04			
	15:31			16:37	14	15:49 (B0021)	17:43		19:51	12	19:21 (B0018)	20:57			21:54			
8	08:39			07:49		15:35 (B0021)	06:37		06:11		19:08 (B0018)	04:54			04:03			
	15:33			16:40	12	15:47 (B0021)	17:45		19:53	16	19:24 (B0018)	20:59			21:55			
9	08:39			07:46		15:38 (B0021)	06:35		06:09		19:06 (B0018)	04:52			04:02			
	15:35			16:42	8	15:46 (B0021)	17:47		19:56	19	19:25 (B0018)	21:02			21:56			
10	08:38			07:44			06:32		06:06		19:05 (B0018)	04:50			04:01			
	15:37			16:45			17:49		19:58	20	19:25 (B0018)	21:04			21:57			
11	08:37			07:42			06:29		06:03		19:05 (B0018)	04:48			04:01			
	15:38			16:47			17:52		20:00	21	19:26 (B0018)	21:06			21:58			
12	08:36			07:39			06:26		06:00		19:04 (B0018)	04:45			04:00			
	15:40			16:49			17:54		20:02	22	19:26 (B0018)	21:08			21:59			
13	08:35			07:37			06:24		05:58		19:04 (B0018)	04:43			04:00			
	15:42			16:52			17:56		20:04	21	19:25 (B0018)	21:10			22:00			
14	08:33			07:35			06:21		05:55		19:04 (B0018)	04:41			03:59			
	15:44			16:54			17:58		20:07	24	19:36 (B0012)	21:12			22:00			
15	08:32			07:32			06:18		05:52		19:04 (B0018)	04:39			03:59			
	15:46			16:56			18:01		20:09	27	19:38 (B0012)	21:14			22:01			
16	08:31			07:30			06:15		05:50		19:04 (B0018)	04:37			03:59			
	15:48			16:59			18:03		20:11	30	19:40 (B0012)	21:16			22:02			
17	08:30			07:27		16:26 (B0020)	06:13		05:47		19:05 (B0018)	04:35			03:58			
	15:50			17:01	3	16:29 (B0020)	18:05		20:13	30	19:42 (B0012)	21:18			22:02			
18	08:28			07:25		16:24 (B0020)	06:10	17:36 (B0019)	05:44		19:06 (B0018)	04:33			03:58			
	15:52			17:03	8	16:32 (B0020)	18:07	2	20:16	28	19:42 (B0012)	21:20			22:03			
19	08:27			07:22		16:22 (B0020)	06:07	17:34 (B0019)	05:42		19:08 (B0018)	04:31			03:58			
	15:54			17:06	12	16:34 (B0020)	18:10	6	20:18	23	19:42 (B0012)	21:22			22:03			
20	08:25			07:20		16:21 (B0020)	06:04	17:32 (B0019)	05:39		19:12 (B0018)	04:29			03:58			
	15:56			17:08	15	16:36 (B0020)	18:12	10	20:20	12	19:40 (B0012)	21:24			22:04			
21	08:24			07:17		16:20 (B0020)	06:01	17:32 (B0019)	05:36		19:32 (B0012)	04:27			03:58			
	15:58			17:11	17	16:37 (B0020)	18:14	12	20:22	12	19:51 (B0017)	21:26			22:04			
22	08:22			07:15		16:21 (B0020)	05:59	17:32 (B0019)	05:34		19:44 (B0017)	04:26			03:59			
	16:01			17:13	16	16:37 (B0020)	18:16	15	20:24	8	19:52 (B0017)	21:28			22:04			
23	08:21			07:12		16:20 (B0020)	05:56	17:32 (B0019)	05:31		19:43 (B0017)	04:24			03:59			
	16:03			17:15	17	16:37 (B0020)	18:18	15	20:27	12	19:55 (B0017)	21:30			22:04			
24	08:19			07:09		16:21 (B0020)	05:53	17:32 (B0019)	05:28		19:42 (B0017)	04:22			03:59			
	16:05			17:17	15	16:36 (B0020)	18:21	14	20:29	14	19:56 (B0017)	21:32			22:04			
25	08:17			07:07		16:22 (B0020)	05:50	17:32 (B0019)	05:26		19:42 (B0017)	04:20			04:00			
	16:07			17:20	14	16:36 (B0020)	18:23	12	20:31	16	19:58 (B0017)	21:34			22:04			
26	08:15			07:04		16:23 (B0020)	05:47	17:34 (B0019)	05:23		19:42 (B0017)	04:19			04:00			
	16:09			17:22	12	16:35 (B0020)	18:25	8	20:33	17	19:59 (B0017)	21:35			22:04			
27	08:13			07:02		16:25 (B0020)	05:45		05:21		19:41 (B0017)	04:17			04:01			
	16:12			17:24	7	16:32 (B0020)	18:27		20:35	17	19:58 (B0017)	21:37			22:04			
28	08:12			06:59			05:42		05:18		19:42 (B0017)	04:16			04:01			
	16:14			17:27			18:29		20:38	16	19:58 (B0017)	21:39			22:04			
29	08:10	15:35 (B0021)					06:39		05:16		19:41 (B0017)	04:14			04:02			
	16:16	4	15:39 (B0021)				19:32		20:40	15	19:56 (B0017)	21:41			22:03			
30	08:08	15:34 (B0021)					06:36	19:00 (B0025)	05:13		19:42 (B0017)	04:13			04:03			
	16:19	8	15:42 (B0021)				19:34	4	20:42	14	19:56 (B0017)	21:42			22:03			
31	08:06	15:33 (B0021)					06:34	18:59 (B0025)				04:12						
	16:21	11	15:44 (B0021)				19:36	8	19:07 (B0025)			21:44						
Potential sun hours	228			262			366		429		515			539				
Total, worst case	23			267			106		513		18							
Sun reduction	0,19			0,16			0,22		0,42		0,53							
Oper. time red.	0,99			0,99			0,99		0,99		0,99							
Wind dir. red.	0,69			0,69			0,65		0,62		0,60							
Total reduction	0,13			0,11			0,15		0,26		0,32							
Total, real	3			30			15		135		6							

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:10>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (921)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONBERG]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:04 (B0018) 18:36	07:01 16:15	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	19:04 (B0018) 18:34	07:04 16:13	08:17 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:04 (B0018) 18:31	07:06 16:10	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	19:05 (B0018) 18:28	07:08 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:06 (B0018) 18:25	07:10 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	18:58 (B0025) 18:23	07:12 16:04	08:24 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	18:55 (B0025) 18:20	07:14 16:01	08:26 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	18:53 (B0025) 18:17	07:17 15:59	08:27 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	18:52 (B0025) 18:14	07:19 15:57	08:29 15:14
10	04:13 21:55	05:11 20:57	06:17 19:35	18:51 (B0025) 18:12	07:21 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	19:54 (B0017) 20:02 (B0017)	06:19 19:32	07:23 18:09	08:31 15:13
12	04:16 21:53	05:15 20:53	19:52 (B0017) 20:04 (B0017)	06:21 19:30	07:25 18:06	08:33 15:13
13	04:18 21:52	05:18 20:50	19:51 (B0017) 20:04 (B0017)	06:23 19:27	07:28 18:03	08:34 15:13
14	04:19 21:50	05:20 20:48	19:50 (B0017) 20:05 (B0017)	06:25 19:24	17:00 (B0020) 18:01	08:35 15:12
15	04:21 21:49	05:22 20:45	19:49 (B0017) 20:05 (B0017)	06:28 19:21	17:02 (B0020) 17:58	08:36 15:12
16	04:23 21:47	05:24 20:43	19:49 (B0017) 20:05 (B0017)	06:30 19:18	17:06 (B0020) 17:55	08:37 15:12
17	04:24 21:46	05:26 20:40	19:48 (B0017) 20:05 (B0017)	06:32 19:16	16:54 (B0020) 17:53	08:38 15:12
18	04:26 21:44	05:28 20:37	19:48 (B0017) 20:05 (B0017)	06:34 19:13	17:07 (B0020) 17:50	08:39 15:13
19	04:28 21:43	05:30 20:35	19:48 (B0017) 20:02 (B0017)	06:36 19:10	17:08 (B0020) 17:48	08:40 15:13
20	04:29 21:41	05:33 20:32	19:49 (B0017) 20:00 (B0017)	06:38 19:07	16:51 (B0020) 17:45	08:40 15:13
21	04:31 21:39	05:35 20:30	19:40 (B0012) 19:57 (B0017)	06:40 19:04	17:07 (B0020) 17:42	08:41 15:13
22	04:33 21:38	05:37 20:27	19:36 (B0012) 19:55 (B0017)	06:42 19:02	17:08 (B0020) 17:40	08:42 15:14
23	04:35 21:36	05:39 20:24	19:16 (B0018) 19:45 (B0012)	06:44 18:59	16:52 (B0020) 17:37	08:42 15:14
24	04:37 21:34	05:41 20:22	19:12 (B0018) 19:46 (B0012)	06:47 18:56	16:54 (B0020) 17:35	08:43 15:15
25	04:39 21:32	05:43 20:19	19:10 (B0018) 19:46 (B0012)	06:49 18:53	17:00 (B0020) 16:32	08:43 15:16
26	04:41 21:30	05:45 20:16	19:08 (B0018) 19:45 (B0012)	06:51 18:50	15:57 (B0020) 16:30	08:43 15:16
27	04:42 21:28	05:47 20:14	19:07 (B0018) 19:42 (B0012)	06:53 18:48	15:58 (B0020) 16:27	08:43 15:17
28	04:44 21:26	05:50 20:11	19:06 (B0018) 19:40 (B0012)	06:55 18:45	15:25 16:25	08:43 15:18
29	04:46 21:24	05:52 20:08	19:05 (B0018) 19:37 (B0012)	06:57 18:42	15:24 16:22	08:43 15:19
30	04:48 21:22	05:54 20:06	19:04 (B0018) 19:26 (B0018)	06:59 18:39	15:23 16:20	08:43 15:20
31	04:50 21:20	05:56 20:03	19:04 (B0018) 19:26 (B0018)	07:08 16:17	15:22 16:17	08:43 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		380	268	134	155	
Sun reduction		0,35	0,31	0,26	0,17	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,61	0,64	0,69	0,69	
Total reduction		0,22	0,20	0,18	0,12	
Total, real		82	54	24	18	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (845)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January			February			March			April			May			June		
1	08:43		13:55 (B0023)	08:04			06:56			16:41 (B0020)	06:31		05:11			19:50 (B0017)	04:10	
	15:23	16	14:11 (B0023)	16:23			17:29	15	16:56 (B0020)	19:38			20:44	13	20:03 (B0017)	21:45		
2	08:43		13:56 (B0023)	08:02			06:54			16:40 (B0020)	06:28		05:08			19:51 (B0017)	04:09	
	15:24	15	14:11 (B0023)	16:26			17:31	16	16:56 (B0020)	19:40			20:46	12	20:03 (B0017)	21:47		
3	08:42		13:56 (B0023)	08:00			06:51			16:40 (B0020)	06:25	19:09 (B0025)	05:06			19:52 (B0017)	04:08	
	15:26	15	14:11 (B0023)	16:28			17:34	15	16:55 (B0020)	19:42	4	19:13 (B0025)	20:49	8	20:00 (B0017)	21:48		
4	08:42		13:58 (B0023)	07:57			06:48			16:41 (B0020)	06:22		05:04			19:55 (B0017)	04:07	
	15:27	14	14:12 (B0023)	16:30			17:36	13	16:54 (B0020)	19:45	6	19:14 (B0025)	20:51	3	19:58 (B0017)	21:50		
5	08:41		13:59 (B0023)	07:55			06:46			16:43 (B0020)	06:20		05:01				04:06	
	15:28	13	14:12 (B0023)	16:33			17:38	10	16:53 (B0020)	19:47	9	19:17 (B0025)	20:53			21:51		
6	08:41		13:59 (B0023)	07:53			06:43			16:46 (B0020)	06:17		04:59			04:05		
	15:30	12	14:11 (B0023)	16:35			17:40	3	16:49 (B0020)	19:49	12	19:19 (B0025)	20:55			21:52		
7	08:40		14:01 (B0023)	07:51		15:59 (B0021)	06:40			06:14		19:07 (B0025)	04:57			04:04		
	15:31	10	14:11 (B0023)	16:37	4	16:03 (B0021)	17:43			19:51	12	19:19 (B0025)	20:57			21:53		
8	08:39		14:02 (B0023)	07:49		15:58 (B0021)	06:37			06:11		19:09 (B0025)	04:54			04:03		
	15:33	9	14:11 (B0023)	16:40	7	16:05 (B0021)	17:45			19:53	9	19:18 (B0025)	20:59			21:55		
9	08:38		14:04 (B0023)	07:46		15:57 (B0021)	06:35			06:09		19:11 (B0025)	04:52			04:02		
	15:35	6	14:10 (B0023)	16:42	11	16:08 (B0021)	17:47			19:56	4	19:15 (B0025)	21:02			21:56		
10	08:38			07:44		15:56 (B0021)	06:32			06:06			04:50			04:01		
	15:37			16:45	14	16:10 (B0021)	17:49			19:58			21:04			21:57		
11	08:37			07:42		15:57 (B0021)	06:29			06:03		19:25 (B0018)	04:48			04:01		
	15:38			16:47	16	16:13 (B0021)	17:52			20:00	5	19:30 (B0018)	21:06			21:58		
12	08:36			07:39		15:56 (B0021)	06:26			06:00		19:22 (B0018)	04:45			04:00		
	15:40			16:49	16	16:12 (B0021)	17:54			20:02	10	19:32 (B0018)	21:08			21:59		
13	08:35			07:37		15:57 (B0021)	06:24			05:58		19:20 (B0018)	04:43			04:00		
	15:42			16:52	16	16:13 (B0021)	17:56			20:04	14	19:34 (B0018)	21:10			22:00		
14	08:33			07:35		15:57 (B0021)	06:21			05:55		19:20 (B0018)	04:41			03:59		
	15:44			16:54	15	16:12 (B0021)	17:58			20:07	16	19:36 (B0018)	21:12			22:00		
15	08:32			07:32		15:58 (B0021)	06:18			05:52		19:19 (B0018)	04:39			03:59		
	15:46			16:56	13	16:11 (B0021)	18:01			20:09	18	19:37 (B0018)	21:14			22:01		
16	08:31			07:30		16:00 (B0021)	06:15			05:50		19:18 (B0018)	04:37			03:59		
	15:48			16:59	10	16:10 (B0021)	18:03			20:11	19	19:37 (B0018)	21:16			22:02		
17	08:30			07:27		16:02 (B0021)	06:13			05:47		19:18 (B0018)	04:35			03:58		
	15:50			17:01	5	16:07 (B0021)	18:05			20:13	19	19:37 (B0018)	21:18			22:02		
18	08:28			07:25			06:10			05:44		19:18 (B0018)	04:33			03:58		
	15:52			17:03			18:07			20:15	18	19:36 (B0018)	21:20			22:03		
19	08:27			07:22			06:07			05:42		19:18 (B0018)	04:31			03:58		
	15:54			17:06			18:09			20:18	18	19:36 (B0018)	21:22			22:03		
20	08:25			07:20			06:04			05:39		19:18 (B0018)	04:29			03:58		
	15:56			17:08			18:12			20:20	17	19:35 (B0018)	21:24			22:04		
21	08:24			07:17			06:01			05:36		19:20 (B0018)	04:27			03:58		
	15:58			17:10			18:14			20:22	14	19:34 (B0018)	21:26			22:04		
22	08:22			07:15			05:59			05:34		19:21 (B0018)	04:26			03:59		
	16:01			17:13			18:16			20:24	11	19:32 (B0018)	21:28			22:04		
23	08:21			07:12			05:56		17:48 (B0019)	05:31		19:23 (B0018)	04:24			03:59		
	16:03			17:15			18:18	1	17:49 (B0019)	20:27	7	19:30 (B0018)	21:30			22:04		
24	08:19			07:09			05:53		17:46 (B0019)	05:28		19:52 (B0017)	04:22			03:59		
	16:05			17:17			18:21	5	17:51 (B0019)	20:29	4	19:56 (B0017)	21:32			22:04		
25	08:17			07:07		16:44 (B0020)	05:50		17:45 (B0019)	05:26		19:51 (B0017)	04:20			04:00		
	16:07			17:20	5	16:49 (B0020)	18:23	8	17:53 (B0019)	20:31	8	19:59 (B0017)	21:34			22:04		
26	08:15			07:04		16:42 (B0020)	05:47		17:44 (B0019)	05:23		19:51 (B0017)	04:19			04:00		
	16:09			17:22	10	16:52 (B0020)	18:25	11	17:55 (B0019)	20:33	10	20:01 (B0017)	21:35			22:04		
27	08:13			07:02		16:41 (B0020)	05:45		17:45 (B0019)	05:21		19:49 (B0017)	04:17			04:01		
	16:12			17:24	13	16:54 (B0020)	18:27	13	17:58 (B0019)	20:35	14	20:03 (B0017)	21:37			22:04		
28	08:12			06:59		16:40 (B0020)	05:42		17:45 (B0019)	05:18		19:50 (B0017)	04:16			04:01		
	16:14			17:27	15	16:55 (B0020)	18:29	13	17:58 (B0019)	20:38	15	20:05 (B0017)	21:39			22:04		
29	08:10						06:39		18:45 (B0019)	05:16		19:49 (B0017)	04:14			04:02		
	16:16						19:31	12	18:57 (B0019)	20:40	15	20:04 (B0017)	21:41			22:03		
30	08:08						06:36		18:46 (B0019)	05:13		19:49 (B0017)	04:13			04:03		
	16:19						19:34	9	18:55 (B0019)	20:42	15	20:04 (B0017)	21:42			22:03		
31	08:06						06:34		18:49 (B0019)				04:12					
	16:21						19:36	4	18:53 (B0019)				21:44					
Potential sun hours	228			262			366			429			515			539		
Total, worst case		110			170			148		323				36				
Sun reduction		0,19			0,16			0,22		0,42				0,53				
Oper. time red.		0,99			0,99			0,99		0,99				0,99				
Wind dir. red.		0,69			0,69			0,66		0,61				0,60				
Total reduction		0,13			0,11			0,15		0,26				0,32				
Total, real		14			19			22		85				12				

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:13>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (845)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:24 (B0018) 19:29 (B0018)	07:01 18:36	07:10 16:15
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	13 15:39 (B0021) 08:17
3	04:05 22:01	04:57 21:14	06:02 19:55	19:09 (B0025) 19:13 (B0025)	07:06 18:31	07:15 16:10
4	04:06 22:01	04:59 21:11	06:04 19:52	19:06 (B0025) 19:15 (B0025)	07:08 18:28	07:17 16:08
5	04:07 22:00	05:01 21:09	06:07 19:49	19:04 (B0025) 19:16 (B0025)	07:10 18:25	07:20 16:06
6	04:08 21:59	05:03 21:07	06:09 19:46	19:03 (B0025) 19:15 (B0025)	07:12 18:23	07:22 16:04
7	04:10 21:58	05:05 21:04	06:11 19:44	19:03 (B0025) 19:13 (B0025)	07:14 18:20	07:24 16:01
8	04:11 21:57	05:07 21:02	06:13 19:41	19:03 (B0025) 19:10 (B0025)	07:17 18:17	07:27 15:59
9	04:12 21:56	05:09 21:00	20:03 (B0017) 20:08 (B0017)	06:15 19:38	17:19 (B0020) 17:26 (B0020)	07:29 15:57
10	04:13 21:55	05:11 20:57	20:01 (B0017) 20:10 (B0017)	06:17 19:35	17:15 (B0020) 17:29 (B0020)	07:31 15:55
11	04:15 21:54	05:13 20:55	19:59 (B0017) 20:11 (B0017)	06:19 19:32	17:14 (B0020) 17:29 (B0020)	07:33 15:53
12	04:16 21:53	05:15 20:52	19:58 (B0017) 20:12 (B0017)	06:21 19:30	17:14 (B0020) 17:30 (B0020)	07:36 15:51
13	04:18 21:52	05:18 20:50	19:58 (B0017) 20:12 (B0017)	06:23 19:27	17:14 (B0020) 17:29 (B0020)	07:38 15:49
14	04:19 21:50	05:20 20:48	19:57 (B0017) 20:12 (B0017)	06:25 19:24	17:13 (B0020) 18:01	07:40 15:47
15	04:21 21:49	05:22 20:45	19:57 (B0017) 20:12 (B0017)	06:28 19:21	17:14 (B0020) 17:26 (B0020)	07:42 15:45
16	04:23 21:47	05:24 20:43	19:57 (B0017) 20:10 (B0017)	06:30 19:18	17:15 (B0020) 17:23 (B0020)	07:45 15:43
17	04:24 21:46	05:26 20:40	19:57 (B0017) 20:07 (B0017)	06:32 19:16	17:16 (B0020) 17:53	07:47 15:41
18	04:26 21:44	05:28 20:37	19:58 (B0017) 20:05 (B0017)	06:34 19:13	17:16 (B0020) 17:50	07:49 15:39
19	04:28 21:43	05:30 20:35	19:59 (B0017) 20:02 (B0017)	06:36 19:10	17:17 (B0020) 17:48	07:51 15:38
20	04:29 21:41	05:33 20:32	19:28 (B0018) 19:36 (B0018)	06:38 19:07	17:17 (B0020) 17:45	07:53 15:36
21	04:31 21:39	05:35 20:30	19:26 (B0018) 19:38 (B0018)	06:40 19:04	17:17 (B0020) 17:42	07:56 15:34
22	04:33 21:38	05:37 20:27	19:24 (B0018) 19:39 (B0018)	06:42 19:02	17:17 (B0020) 17:40	07:58 15:33
23	04:35 21:36	05:39 20:24	19:23 (B0018) 19:40 (B0018)	06:44 18:59	17:17 (B0020) 17:37	08:00 15:31
24	04:37 21:34	05:41 20:22	19:22 (B0018) 19:40 (B0018)	06:47 18:56	17:17 (B0020) 17:35	08:02 15:30
25	04:39 21:32	05:43 20:19	19:21 (B0018) 19:40 (B0018)	06:49 18:53	15:31 (B0021) 15:38 (B0021)	08:04 15:28
26	04:41 21:30	05:45 20:16	19:21 (B0018) 19:40 (B0018)	06:51 18:50	15:29 (B0021) 15:40 (B0021)	08:06 15:27
27	04:42 21:28	05:47 20:14	19:21 (B0018) 19:40 (B0018)	06:53 18:48	15:28 (B0021) 15:41 (B0021)	08:08 15:25
28	04:44 21:26	05:50 20:11	19:20 (B0018) 19:39 (B0018)	06:55 18:45	15:27 (B0021) 15:41 (B0021)	08:10 15:24
29	04:46 21:24	05:52 20:08	19:21 (B0018) 19:37 (B0018)	06:57 18:42	15:27 (B0021) 15:42 (B0021)	08:12 15:23
30	04:48 21:22	05:54 20:06	19:21 (B0018) 19:34 (B0018)	06:59 18:39	15:26 (B0021) 15:42 (B0021)	08:14 15:22
31	04:50 21:20	05:56 20:03	19:22 (B0018) 19:32 (B0018)	07:08 16:17	15:26 (B0021) 15:42 (B0021)	08:43 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		302	140	209	33	454
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,60	0,64	0,68	0,69	0,69
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		65	28	37	4	42

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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:14>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (890)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	08:43	13:43 (B0023)	08:04	06:56	16:35 (B0020)	06:31	05:11	19:52 (B0017)	04:10		
	15:23	11 13:54 (B0023)	16:23	17:29	16 16:51 (B0020)	19:38	20:44	16 20:08 (B0017)	21:45		
2	08:43	13:44 (B0023)	08:02	06:54	16:35 (B0020)	06:28	05:08	19:52 (B0017)	04:09		
	15:24	9 13:53 (B0023)	16:26	17:31	15 16:50 (B0020)	19:40	20:46	16 20:08 (B0017)	21:47		
3	08:42	13:45 (B0023)	08:00	06:51	16:35 (B0020)	06:25	19:10 (B0025)	05:06	19:52 (B0017)	04:08	
	15:26	8 13:53 (B0023)	16:28	17:34	14 16:49 (B0020)	19:42	3 19:13 (B0025)	20:49	15 20:07 (B0017)	21:48	
4	08:42	13:48 (B0023)	07:57	06:48	16:37 (B0020)	06:22	19:09 (B0025)	05:04	19:53 (B0017)	04:07	
	15:27	4 13:52 (B0023)	16:30	17:36	10 16:47 (B0020)	19:45	6 19:15 (B0025)	20:51	14 20:07 (B0017)	21:50	
5	08:41		07:55	06:46	16:40 (B0020)	06:20	19:08 (B0025)	05:01	19:54 (B0017)	04:06	
	15:28		16:33	8 15:58 (B0021)	17:38	5 16:45 (B0020)	19:17 (B0025)	20:53	12 20:06 (B0017)	21:51	
6	08:41		07:53	06:43		06:17	19:07 (B0025)	04:59	19:55 (B0017)	04:05	
	15:30		16:35	11 16:00 (B0021)	17:40		19:19 (B0025)	20:55	10 20:05 (B0017)	21:52	
7	08:40		07:51	06:40		06:14	19:07 (B0025)	04:57	19:57 (B0017)	04:04	
	15:32		16:37	15 16:03 (B0021)	17:43		19:20 (B0025)	20:57	6 20:03 (B0017)	21:53	
8	08:39		07:49	06:37		06:11	19:08 (B0025)	04:54		04:03	
	15:33		16:40	16 16:04 (B0021)	17:45		19:20 (B0025)	20:59		21:55	
9	08:39		07:46	06:35		06:09	19:08 (B0025)	04:52		04:02	
	15:35		16:42	17 16:05 (B0021)	17:47		19:18 (B0025)	21:02		21:56	
10	08:38		07:44	06:32		06:06	19:10 (B0025)	04:50		04:01	
	15:37		16:45	16 16:04 (B0021)	17:49		19:16 (B0025)	21:04		21:57	
11	08:37		07:42	06:29		06:03		04:48		04:01	
	15:38		16:47	17 16:05 (B0021)	17:52		20:00	21:06		21:58	
12	08:36		07:39	06:26		06:00		04:45		04:00	
	15:40		16:49	16 16:04 (B0021)	17:54		20:02	21:08		21:59	
13	08:35		07:37	06:24		05:58	19:25 (B0018)	04:43		04:00	
	15:42		16:52	14 16:04 (B0021)	17:56		20:04	9 19:34 (B0018)	21:10	22:00	
14	08:33		07:35	06:21		05:55	19:23 (B0018)	04:41		03:59	
	15:44		16:54	11 16:02 (B0021)	17:58		20:07	13 19:36 (B0018)	21:12	22:00	
15	08:32		07:32	06:18		05:52	19:22 (B0018)	04:39		03:59	
	15:46		16:56	7 16:00 (B0021)	18:01		20:09	16 19:38 (B0018)	21:14	22:01	
16	08:31		07:30	06:15		05:50	19:20 (B0018)	04:37		03:59	
	15:48		16:59	18:03		20:11	19:39 (B0018)	21:16		22:02	
17	08:30		07:27	06:13		05:47	19:20 (B0018)	04:35		03:59	
	15:50		17:01	18:05		20:13	19:40 (B0018)	21:18		22:02	
18	08:28		07:25	06:10		05:44	19:19 (B0018)	04:33		03:58	
	15:52		17:03	18:07		20:16	19:44 (B0012)	21:20		22:03	
19	08:27		07:22	06:07		05:42	19:19 (B0018)	04:31		03:58	
	15:54		17:06	18:10		20:18	19:47 (B0012)	21:22		22:03	
20	08:25		07:20	06:04		05:39	19:18 (B0018)	04:29		03:58	
	15:56		17:08	18:12		20:20	30 19:48 (B0012)	21:24		22:04	
21	08:24		07:17	06:01		05:36	19:19 (B0018)	04:27		03:58	
	15:58		17:11	18:14		20:22	32 19:51 (B0012)	21:26		22:04	
22	08:22		07:15	05:59		05:34	19:19 (B0018)	04:26		03:59	
	16:01		17:13	18:16		20:24	31 19:50 (B0012)	21:28		22:04	
23	08:21		07:12	05:56		05:31	19:20 (B0018)	04:24		03:59	
	16:03		17:15	4 16:44 (B0020)	18:18	1 17:49 (B0019)	20:27	29 19:50 (B0012)	21:30	22:04	
24	08:19		07:09	05:53		05:28	19:20 (B0018)	04:22		03:59	
	16:05		17:17	9 16:46 (B0020)	18:21	5 17:51 (B0019)	20:29	25 19:48 (B0012)	21:32	22:04	
25	08:17		07:07	05:50		05:26	19:22 (B0018)	04:20		04:00	
	16:07		17:20	12 16:49 (B0020)	18:23	9 17:53 (B0019)	20:31	19 19:47 (B0012)	21:34	22:04	
26	08:15		07:04	05:47		05:23	19:25 (B0018)	04:19		04:00	
	16:09		17:22	16 16:51 (B0020)	18:25	12 17:55 (B0019)	20:33	12 20:01 (B0017)	21:35	22:04	
27	08:13		07:02	05:45		05:21	19:54 (B0017)	04:17		04:01	
	16:12		17:24	16 16:51 (B0020)	18:27	15 17:58 (B0019)	20:35	9 20:03 (B0017)	21:37	22:04	
28	08:12		06:59	05:42		05:18	19:54 (B0017)	04:16		04:01	
	16:14		17:27	17 16:51 (B0020)	18:29	15 17:58 (B0019)	20:38	11 20:05 (B0017)	21:39	22:04	
29	08:10			06:39		05:16	19:52 (B0017)	04:14		04:02	
	16:16			19:31	14 18:57 (B0019)	20:40	14 20:06 (B0017)	21:41		22:03	
30	08:08			06:36		05:13	19:52 (B0017)	04:13		04:03	
	16:19			19:34	11 18:55 (B0019)	20:42	16 20:08 (B0017)	21:42		22:03	
31	08:06			06:34				04:12			
	16:21			19:36	8 18:54 (B0019)			21:44			
Potential sun hours	228		262	366		429	515		539		
Total, worst case	32		226	150		428	89				
Sun reduction	0,19		0,16	0,22		0,42	0,53				
Oper. time red.	0,99		0,99	0,99		0,99	0,99				
Wind dir. red.	0,69		0,69	0,66		0,61	0,60				
Total reduction	0,13		0,11	0,15		0,26	0,32				
Total, real	4		26	22		111	29				

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:14>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (890)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	08:17 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 20:06 (B0017)	07:12 19:03 (B0025)	07:22 16:04	08:24 15:16
7	04:10 21:58	05:05 21:04	06:11 20:04 (B0017)	07:14 19:03 (B0025)	07:24 16:01	08:26 15:15
8	04:11 21:57	05:07 21:02	06:13 20:03 (B0017)	07:17 19:03 (B0025)	07:27 15:59	08:27 15:15
9	04:12 21:56	05:09 21:00	06:15 20:02 (B0017)	07:19 19:04 (B0025)	07:29 16:00	08:29 15:14
10	04:13 21:55	05:11 20:57	06:17 20:01 (B0017)	07:21 18:12	07:31 15:55	08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 20:01 (B0017)	07:23 18:09	07:33 15:53	08:31 15:13
12	04:16 21:53	05:15 20:52	06:21 20:01 (B0017)	07:25 18:06	07:36 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 20:01 (B0017)	07:28 18:03	07:38 15:49	08:34 15:13
14	04:19 21:50	05:20 20:48	06:25 20:01 (B0017)	07:30 18:01	07:40 15:47	08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 20:01 (B0017)	07:32 18:00	07:42 15:45	08:36 15:12
16	04:23 21:47	05:24 20:43	06:30 20:02 (B0017)	07:34 18:00	07:45 15:43	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 20:07 (B0017)	07:36 18:00	07:47 15:41	08:38 15:12
18	04:26 21:44	05:28 20:37	06:34 20:07 (B0017)	07:39 18:00	07:49 15:39	08:39 15:13
19	04:28 21:43	05:30 20:35	06:36 20:07 (B0017)	07:41 18:00	07:51 15:38	08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 20:07 (B0017)	07:43 18:00	07:53 15:36	08:41 15:13
21	04:31 21:39	05:35 20:30	06:40 20:07 (B0017)	07:45 18:00	07:56 15:34	08:42 15:13
22	04:33 21:38	05:37 20:27	06:42 20:07 (B0017)	07:48 18:00	07:58 15:33	08:43 15:14
23	04:35 21:36	05:39 20:24	06:44 20:07 (B0017)	07:50 18:00	08:00 15:31	08:44 15:14
24	04:37 21:34	05:41 20:22	06:47 20:07 (B0017)	07:52 18:00	08:02 15:30	08:45 15:15
25	04:39 21:32	05:43 20:19	06:49 20:07 (B0017)	07:54 18:00	08:04 15:28	08:46 15:16
26	04:41 21:30	05:45 20:16	06:51 20:07 (B0017)	07:56 18:00	08:06 15:27	08:47 15:16
27	04:42 21:28	05:47 20:14	06:53 20:07 (B0017)	07:59 18:00	08:08 15:25	08:48 15:17
28	04:44 21:26	05:50 20:11	06:55 20:07 (B0017)	08:01 18:00	08:10 15:24	08:49 15:18
29	04:46 21:24	05:52 20:08	06:57 20:07 (B0017)	08:03 18:00	08:12 15:23	08:50 15:19
30	04:48 21:22	05:54 20:06	06:59 20:07 (B0017)	08:05 18:00	08:14 15:22	08:51 15:20
31	04:50 21:20	05:56 20:03	18:39	08:07 16:17	15:21	08:52 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		445	167	201	85	305
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,60	0,64	0,69	0,69	0,69
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		96	34	36	10	28

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:15>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (920)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January			February			March			April			May			June		
	1	08:43 15:23	4 13:40 (B0023) 13:44 (B0023)	08:04 16:23		06:56 17:29	17	16:32 (B0020) 16:49 (B0020)	06:31 19:38	4	18:47 (B0019) 18:51 (B0019)	05:11 20:44	16	19:54 (B0017) 20:10 (B0017)	04:10 21:45			
	2	08:43 15:24		08:02 16:26	1 15:50 (B0021)	06:54 17:31	15	16:33 (B0020) 16:48 (B0020)	06:28 19:40			05:08 20:46	17	19:54 (B0017) 20:11 (B0017)	04:09 21:47			
	3	08:42 15:26		08:00 16:28	15:46 (B0021) 15:52 (B0021)	06:51 17:34	13	16:33 (B0020) 16:46 (B0020)	06:25 19:42	2	19:11 (B0025) 19:13 (B0025)	05:06 20:49	17	19:53 (B0017) 20:10 (B0017)	04:08 21:48			
	4	08:42 15:27		07:57 16:30	15:45 (B0021) 15:55 (B0021)	06:48 17:36	9	16:35 (B0020) 16:44 (B0020)	06:22 19:45	5	19:10 (B0025) 19:15 (B0025)	05:04 20:51	16	19:54 (B0017) 20:10 (B0017)	04:07 21:50			
	5	08:41 15:28		07:55 16:33	15:45 (B0021) 15:58 (B0021)	06:46 17:38			06:20 19:47	9	19:08 (B0025) 19:17 (B0025)	05:01 20:53	15	19:54 (B0017) 20:09 (B0017)	04:06 21:51			
	6	08:41 15:30		07:53 16:35	15:44 (B0021) 16:00 (B0021)	06:43 17:40			06:17 19:49	11	19:08 (B0025) 19:19 (B0025)	04:59 20:55	14	19:55 (B0017) 20:09 (B0017)	04:05 21:52			
	7	08:40 15:32		07:51 16:37	15:44 (B0021) 16:01 (B0021)	06:40 17:43			06:14 19:51	13	19:07 (B0025) 19:20 (B0025)	04:57 20:57	12	19:56 (B0017) 20:08 (B0017)	04:04 21:53			
	8	08:39 15:33		07:49 16:40	15:43 (B0021) 16:01 (B0021)	06:37 17:45			06:11 19:53	13	19:08 (B0025) 19:21 (B0025)	04:54 20:59	8	19:58 (B0017) 20:06 (B0017)	04:03 21:55			
	9	08:39 15:35		07:46 16:42	15:44 (B0021) 16:01 (B0021)	06:35 17:47			06:09 19:56	11	19:08 (B0025) 19:19 (B0025)	04:52 21:02	3	20:00 (B0017) 20:03 (B0017)	21:55 21:56			
	10	08:38 15:37		07:44 16:45	15:44 (B0021) 16:01 (B0021)	06:32 17:49			06:06 19:58	8	19:09 (B0025) 19:17 (B0025)	04:50 21:04			21:52 21:57			
	11	08:37 15:38		07:42 16:47	15:45 (B0021) 16:01 (B0021)	06:29 17:52			06:03 20:00			04:48 21:06			21:53 21:58			
	12	08:36 15:40		07:39 16:49	15:45 (B0021) 16:00 (B0021)	06:26 17:54			06:00 20:02			04:45 21:08			21:59 22:00			
	13	08:35 15:42		07:37 16:52	15:47 (B0021) 15:59 (B0021)	06:24 17:56			05:58 20:04	5	19:29 (B0018) 19:34 (B0018)	21:02 21:10			22:00 22:01			
	14	08:33 15:44		07:35 16:54	15:49 (B0021) 15:57 (B0021)	06:21 17:58			05:55 20:07	10	19:26 (B0018) 19:36 (B0018)	21:10 21:12			22:01 22:02			
	15	08:32 15:46		07:32 16:56		06:18 18:01			05:52 20:09	15	19:23 (B0018) 19:38 (B0018)	21:12 21:14			22:02 22:03			
	16	08:31 15:48		07:30 16:59		06:15 18:03			05:50 20:11	17	19:22 (B0018) 19:39 (B0018)	21:14 21:16			22:04 22:05			
	17	08:30 15:50		07:27 17:01		06:13 18:05			05:47 20:13	20	19:21 (B0018) 19:41 (B0018)	21:16 21:18			22:06 22:07			
	18	08:28 15:52		07:25 17:03		06:10 18:07			05:44 20:16	22	19:20 (B0018) 19:44 (B0012)	21:18 21:20			22:08 22:09			
	19	08:27 15:54		07:22 17:06		06:07 18:10			05:42 20:18	27	19:20 (B0018) 19:47 (B0012)	21:20 21:22			22:10 22:11			
	20	08:25 15:56		07:20 17:08		06:04 18:12			05:39 20:20	29	19:19 (B0018) 19:48 (B0012)	21:22 21:24			22:12 22:13			
	21	08:24 15:58		07:17 17:11		06:01 18:14			05:36 20:22	32	19:19 (B0018) 19:51 (B0012)	21:24 21:26			22:14 22:15			
	22	08:22 16:01		07:15 17:13	16:39 (B0020) 16:42 (B0020)	05:59 18:16			05:34 20:24	32	19:19 (B0018) 19:51 (B0012)	21:26 21:28			22:16 22:17			
	23	08:21 16:03		07:12 17:15	16:36 (B0020) 16:44 (B0020)	05:56 18:18	2	17:47 (B0019) 17:49 (B0019)	05:31 20:27	31	19:20 (B0018) 19:51 (B0012)	21:28 21:30			22:18 22:19			
	24	08:19 16:05		07:09 17:17	16:34 (B0020) 16:46 (B0020)	05:53 18:21	6	17:45 (B0019) 17:51 (B0019)	05:28 20:29	29	19:20 (B0018) 19:50 (B0012)	21:30 21:32			22:20 22:21			
	25	08:17 16:07		07:07 17:20	16:33 (B0020) 16:49 (B0020)	05:50 18:23	9	17:44 (B0019) 17:53 (B0019)	05:26 20:31	26	19:21 (B0018) 19:49 (B0012)	21:32 21:34			22:22 22:23			
	26	08:15 16:09		07:04 17:22	16:32 (B0020) 16:49 (B0020)	05:47 18:25	13	17:42 (B0019) 17:55 (B0019)	05:23 20:33	20	19:23 (B0018) 19:48 (B0012)	21:34 21:35			22:24 22:25			
	27	08:13 16:12		07:02 17:24	16:32 (B0020) 16:49 (B0020)	05:45 18:27	15	17:43 (B0019) 17:58 (B0019)	05:21 20:35	16	19:24 (B0018) 20:03 (B0017)	21:35 21:37			22:26 22:27			
	28	08:12 16:14		06:59 17:27	16:31 (B0020) 16:48 (B0020)	05:42 18:29	16	17:42 (B0019) 17:58 (B0019)	05:18 20:38	11	19:28 (B0018) 20:05 (B0017)	21:37 21:39			22:28 22:29			
	29	08:10 16:16				06:39 19:32	15	18:42 (B0019) 18:57 (B0019)	05:16 20:40	12	19:54 (B0017) 20:06 (B0017)	21:40 21:41			22:30 22:31			
	30	08:08 16:19				06:36 19:34	13	18:43 (B0019) 18:56 (B0019)	05:13 20:42	15	19:54 (B0017) 20:09 (B0017)	21:41 21:42			22:32 22:33			
	31	08:06 16:21				06:34 19:36	10	18:45 (B0019) 18:55 (B0019)				21:42 21:44						
Potential sun hours		228		262		366		429		515		539						
Total, worst case		4		256		153		445		118								
Sun reduction		0,19		0,16		0,22		0,42		0,53								
Oper. time red.		0,99		0,99		0,99		0,99		0,99								
Wind dir. red.		0,68		0,69		0,66		0,61		0,60								
Total reduction		0,13		0,11		0,15		0,26		0,32								
Total, real		1		29		23		116		38								

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:15 > 1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (920)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	15:13 (B0021) 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	15:30 (B0021) 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	15:31 (B0021) 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	15:30 (B0021) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	07:10 18:25	07:20 16:06	15:31 (B0021) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	07:12 18:23	07:22 16:04	15:13 (B0021) 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	07:14 18:20	07:24 16:01	15:16 (B0021) 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	07:15 18:17	07:27 15:59	15:17 (B0021) 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	07:19 18:14	07:29 15:57	15:15 (B0020) 15:14
10	04:13 21:55	05:11 20:57	06:17 19:35	07:21 18:12	07:31 15:55	15:14 (B0020) 15:14
11	04:15 21:54	05:13 20:55	06:19 19:32	07:23 18:09	07:33 15:53	15:13 (B0020) 15:13
12	04:16 21:53	05:15 20:52	06:21 19:30	07:25 18:06	07:36 15:51	15:31 (B0023) 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	07:28 18:03	07:38 15:49	15:32 (B0023) 15:13
14	04:19 21:50	05:20 20:48	06:25 19:24	07:30 18:01	07:40 15:47	15:35 (B0023) 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	07:32 17:58	07:42 15:45	15:36 (B0023) 15:12
16	04:23 21:47	05:24 20:43	06:30 19:18	07:34 17:55	07:45 15:43	15:37 (B0023) 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	07:36 17:53	07:47 15:41	15:38 (B0023) 15:12
18	04:26 21:44	05:28 20:37	06:34 19:13	07:39 17:50	07:49 15:39	15:39 (B0023) 15:13
19	04:28 21:43	05:30 20:35	06:36 19:10	07:41 17:48	07:51 15:38	15:40 (B0023) 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	07:43 17:45	07:53 15:36	15:41 (B0023) 15:13
21	04:31 21:39	05:35 20:30	06:40 19:04	07:45 17:42	07:56 15:34	15:42 (B0023) 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	07:48 17:40	07:58 15:33	15:43 (B0023) 15:14
23	04:35 21:36	05:39 20:24	06:44 18:59	07:50 17:37	08:00 15:31	15:44 (B0023) 15:14
24	04:37 21:34	05:41 20:22	06:47 18:56	07:52 17:35	08:02 15:30	15:45 (B0023) 15:15
25	04:39 21:32	05:43 20:19	06:49 18:53	07:54 17:32	08:04 15:28	15:46 (B0023) 15:16
26	04:41 21:30	05:45 20:16	06:51 18:50	07:56 17:30	08:06 15:27	15:47 (B0023) 15:16
27	04:42 21:28	05:47 20:14	06:53 18:48	07:59 17:27	08:08 15:25	15:48 (B0023) 15:17
28	04:44 21:26	05:50 20:11	06:55 18:45	08:01 17:25	08:10 15:24	15:49 (B0023) 15:18
29	04:46 21:24	05:52 20:08	06:57 18:42	08:04 17:22	08:12 15:23	15:50 (B0023) 15:19
30	04:48 21:22	05:54 20:06	06:59 18:39	08:06 17:20	08:14 15:22	15:51 (B0023) 15:20
31	04:50 21:20	05:56 20:03		08:08 17:17	08:16 15:20	15:52 (B0023) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		494	178	198	111	214
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,60	0,64	0,69	0,69	0,68
Total reduction		0,21	0,20	0,18	0,12	0,09
Total, real		106	36	35	13	19

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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:15>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (922)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

January		February		March		April		May		June	
1	08:43 15:23	5 13:42 (B0023) 13:47 (B0023)	08:04 16:23		06:56 17:29	16 16:33 (B0020) 16:49 (B0020)	06:31 19:38		05:11 20:44	17 19:52 (B0017) 20:09 (B0017)	04:10 21:45
2	08:43 15:24		08:02 16:26		06:54 17:31	15 16:33 (B0020) 16:48 (B0020)	06:28 19:40		05:08 20:46	17 19:52 (B0017) 20:09 (B0017)	04:09 21:47
3	08:42 15:26		08:00 16:28	5 15:52 (B0021)	06:51 17:34	12 16:34 (B0020) 16:46 (B0020)	06:25 19:42	4 19:09 (B0025) 19:13 (B0025)	05:06 20:49	16 19:52 (B0017) 20:08 (B0017)	04:08 21:48
4	08:42 15:27		07:57 16:30	9 15:46 (B0021)	06:48 17:36	8 16:36 (B0020) 16:44 (B0020)	06:22 19:45	7 19:08 (B0025) 19:15 (B0025)	05:04 20:51	15 19:52 (B0017) 20:07 (B0017)	04:07 21:50
5	08:41 15:28		07:55 16:33	12 15:46 (B0021)	06:46 17:38		06:20 19:47	10 19:07 (B0025) 19:17 (B0025)	05:01 20:53	14 19:53 (B0017) 20:07 (B0017)	04:06 21:51
6	08:41 15:30		07:53 16:35	15 15:45 (B0021)	06:43 17:40		06:17 19:49	12 19:07 (B0025) 19:19 (B0025)	04:59 20:55	11 19:55 (B0017) 20:06 (B0017)	04:05 21:52
7	08:40 15:32		07:51 16:37	17 15:45 (B0021)	06:40 17:43		06:14 19:51	13 19:06 (B0025) 19:19 (B0025)	04:57 20:57	8 19:56 (B0017) 20:04 (B0017)	04:04 21:53
8	08:39 15:33		07:49 16:40	17 15:44 (B0021)	06:37 17:45		06:11 19:53	12 19:07 (B0025) 19:19 (B0025)	04:54 20:59		04:03 21:55
9	08:39 15:35		07:46 16:42	17 15:45 (B0021)	06:35 17:47		06:09 19:56	9 19:08 (B0025) 19:17 (B0025)	04:52 21:02		04:02 21:56
10	08:38 15:37		07:44 16:45	16 15:45 (B0021)	06:32 17:49		06:06 19:58	4 19:10 (B0025) 19:14 (B0025)	04:50 21:04		04:01 21:57
11	08:37 15:38		07:42 16:47	16 15:46 (B0021)	06:29 17:52		06:03 20:00		04:48 21:06		04:01 21:58
12	08:36 15:40		07:39 16:49	14 15:46 (B0021)	06:26 17:54		06:00 20:02	4 19:28 (B0018) 19:32 (B0018)	04:45 21:08		04:00 21:59
13	08:35 15:42		07:37 16:52	12 15:48 (B0021)	06:24 17:56		05:58 20:04	10 19:24 (B0018) 19:34 (B0018)	04:43 21:10		04:00 22:00
14	08:33 15:44		07:35 16:54	7 15:50 (B0021)	06:21 17:58		05:55 20:07	14 19:22 (B0018) 19:36 (B0018)	04:41 21:12		03:59 22:00
15	08:32 15:46		07:32 16:56		06:18 18:01		05:52 20:09	17 19:21 (B0018) 19:38 (B0018)	04:39 21:14		03:59 22:01
16	08:31 15:48		07:30 16:59		06:15 18:03		05:50 20:11	19 19:19 (B0018) 19:38 (B0018)	04:37 21:16		03:59 22:02
17	08:30 15:50		07:27 17:01		06:13 18:05		05:47 20:13	20 19:19 (B0018) 19:39 (B0018)	04:35 21:18		03:59 22:02
18	08:28 15:52		07:25 17:03		06:10 18:07		05:44 20:16	25 19:18 (B0018) 19:44 (B0012)	04:33 21:20		03:58 22:03
19	08:27 15:54		07:22 17:06		06:07 18:10		05:42 20:18	29 19:18 (B0018) 19:47 (B0012)	04:31 21:22		03:58 22:03
20	08:25 15:56		07:20 17:08		06:04 18:12		05:39 20:20	30 19:18 (B0018) 19:48 (B0012)	04:29 21:24		03:58 22:04
21	08:24 15:58		07:17 17:11		06:01 18:14		05:36 20:22	33 19:18 (B0018) 19:51 (B0012)	04:27 21:26		03:58 22:04
22	08:22 16:01		07:15 17:13	3 16:39 (B0020)	05:59 18:16		05:34 20:24	32 19:18 (B0018) 19:50 (B0012)	04:26 21:28		03:59 22:04
23	08:21 16:03		07:12 17:15	8 16:36 (B0020)	05:56 18:18	3 17:46 (B0019) 17:49 (B0019)	05:31 20:27	30 19:19 (B0018) 19:50 (B0012)	04:24 21:30		03:59 22:04
24	08:19 16:05		07:09 17:17	12 16:44 (B0020)	05:53 18:21	7 17:44 (B0019) 17:51 (B0019)	05:28 20:29	25 19:20 (B0018) 19:48 (B0012)	04:22 21:32		03:59 22:04
25	08:17 16:07		07:07 17:20	15 16:34 (B0020)	05:50 18:23	10 17:43 (B0019) 17:53 (B0019)	05:26 20:31	20 19:21 (B0018) 19:47 (B0012)	04:20 21:34		04:00 22:04
26	08:15 16:09		07:04 17:22	16 16:33 (B0020)	05:47 18:25	13 17:42 (B0019) 17:55 (B0019)	05:23 20:33	13 19:24 (B0018) 20:01 (B0017)	04:19 21:35		04:00 22:04
27	08:13 16:12		07:02 17:24	17 16:49 (B0020)	05:45 18:27	16 17:42 (B0019) 17:58 (B0019)	05:21 20:35	9 19:54 (B0017) 20:03 (B0017)	04:17 21:37		04:01 22:04
28	08:12 16:14		06:59 17:27	16 16:32 (B0020)	05:42 18:29	15 17:42 (B0019) 17:57 (B0019)	05:18 20:38	11 19:52 (B0017) 20:05 (B0017)	04:16 21:39		04:01 22:04
29	08:10 16:16				06:39 19:32	14 18:42 (B0019) 18:56 (B0019)	05:16 20:40	14 19:52 (B0017) 20:06 (B0017)	04:14 21:41		04:02 22:03
30	08:08 16:19				06:36 19:34	11 18:43 (B0019) 18:54 (B0019)	05:13 20:42	16 19:52 (B0017) 20:08 (B0017)	04:13 21:42		04:03 22:03
31	08:06 16:21				06:34 19:36	6 18:46 (B0019) 18:52 (B0019)			04:12 21:44		
Potential sun hours	228		262		366		429		515		539
Total, worst case	5		244		146		442		98		
Sun reduction	0,19		0,16		0,22		0,42		0,53		
Oper. time red.	0,99		0,99		0,99		0,99		0,99		
Wind dir. red.	0,69		0,69		0,66		0,61		0,60		
Total reduction	0,13		0,11		0,15		0,26		0,32		
Total, real	1		28		22		115		31		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:15 > 1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (922)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	07:01 18:36	07:10 16:15	15:14 (B0021) 15:21 (B0021)
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:13 16:13	15:14 (B0021) 15:20 (B0021)
3	04:05 22:01	04:57 21:14	06:02 19:55	07:06 18:31	07:15 16:10	15:14 (B0021) 15:19 (B0021)
4	04:06 22:01	04:59 21:11	06:04 19:52	07:08 18:28	07:17 16:08	15:15 (B0021) 15:18 (B0021)
5	04:07 22:00	05:01 21:09	20:08 (B0017) 19:49	07:10 18:25	07:20 16:06	15:14 (B0021) 15:17 (B0021)
6	04:08 21:59	05:03 21:07	20:02 (B0017) 19:46	07:12 18:23	07:22 16:04	15:16 (B0021) 15:16 (B0021)
7	04:10 21:58	05:05 21:04	20:03 (B0017) 19:44	07:14 18:20	07:24 16:01	15:17 (B0021) 15:15 (B0021)
8	04:11 21:57	05:07 21:02	20:02 (B0017) 19:41	07:13 18:17	07:27 15:59	15:18 (B0021) 15:15 (B0021)
9	04:12 21:56	05:09 21:00	20:02 (B0017) 19:38	07:19 18:14	07:29 17:14 (B0020)	15:15 (B0021) 15:29 (B0021)
10	04:13 21:55	05:11 20:57	20:01 (B0017) 19:35	07:21 18:12	07:31 17:10 (B0020)	15:14 (B0021) 15:14 (B0021)
11	04:15 21:54	05:13 20:55	20:01 (B0017) 19:32	07:23 18:09	07:33 17:07 (B0020)	15:13 (B0021) 15:13 (B0021)
12	04:16 21:53	05:15 20:52	20:01 (B0017) 19:30	07:25 18:06	07:36 17:07 (B0020)	15:13 (B0021) 15:13 (B0021)
13	04:18 21:52	05:18 20:50	20:01 (B0017) 19:27	07:28 18:03	07:38 17:06 (B0020)	15:13 (B0021) 15:13 (B0021)
14	04:19 21:50	05:20 20:48	20:01 (B0017) 19:24	07:30 18:01	07:40 17:05 (B0020)	15:13 (B0021) 15:12 (B0021)
15	04:21 21:49	05:22 20:45	20:01 (B0017) 19:21	07:32 17:58	07:42 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
16	04:23 21:47	05:24 20:43	20:02 (B0017) 19:18	07:34 17:55	07:45 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
17	04:24 21:46	05:26 20:40	19:30 (B0018) 19:16	07:36 17:53	07:47 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
18	04:26 21:44	05:28 20:37	19:28 (B0018) 19:13	07:39 17:50	07:49 17:06 (B0020)	15:12 (B0021) 15:12 (B0021)
19	04:28 21:43	05:30 20:35	19:26 (B0018) 19:10	07:41 17:48	07:51 17:07 (B0020)	15:12 (B0021) 15:12 (B0021)
20	04:29 21:41	05:33 20:32	19:25 (B0018) 19:07	07:43 17:45	07:53 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
21	04:31 21:39	05:35 20:30	19:24 (B0018) 19:04	07:45 17:42	07:56 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
22	04:33 21:38	05:37 20:27	19:23 (B0018) 19:02	07:48 17:40	07:58 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
23	04:35 21:36	05:39 20:24	19:22 (B0018) 18:59	07:50 17:37	08:00 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
24	04:37 21:34	05:41 20:22	19:22 (B0018) 18:56	07:52 17:35	08:02 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
25	04:39 21:32	05:43 20:19	19:22 (B0018) 18:53	07:54 17:32	08:04 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
26	04:41 21:30	05:45 20:16	19:22 (B0018) 18:50	07:56 17:30	08:06 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
27	04:42 21:28	05:47 20:14	19:22 (B0018) 18:48	07:59 17:27	08:08 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
28	04:44 21:26	05:50 20:11	19:23 (B0018) 18:45	08:01 17:25	08:10 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
29	04:46 21:24	05:52 20:08	19:23 (B0018) 18:42	08:04 17:22	08:12 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
30	04:48 21:22	05:54 20:06	19:25 (B0018) 18:39	08:06 17:20	08:14 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
31	04:50 21:20	05:56 20:03	19:28 (B0018) 19:32 (B0018)	08:08 17:17	08:16 17:05 (B0020)	15:12 (B0021) 15:12 (B0021)
Potential sun hours	538	474	386	321	241	207
Total, worst case		467	168	188	106	215
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,60	0,64	0,69	0,69	0,69
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		100	34	34	13	20

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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SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:16>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (870)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January			February			March			April			May			June		
1	08:43	10	13:46 (B0023)	08:04			06:56	15	16:35 (B0020)	06:31			05:11	15	19:50 (B0017)	04:10		
	15:23		13:56 (B0023)	16:23			17:29		16:50 (B0020)	19:38			20:44		20:05 (B0017)	21:45		
2	08:43	9	13:47 (B0023)	08:02			06:54	14	16:35 (B0020)	06:28	2	19:09 (B0025)	05:08	14	19:51 (B0017)	04:09		
	15:24		13:56 (B0023)	16:26			17:31		16:49 (B0020)	19:40			20:46		20:05 (B0017)	21:47		
3	08:42	6	13:49 (B0023)	08:00			06:51	12	16:36 (B0020)	06:25	6	19:07 (B0025)	05:06	12	19:51 (B0017)	04:08		
	15:26		13:55 (B0023)	16:28			17:34		16:48 (B0020)	19:42			20:49		20:03 (B0017)	21:48		
4	08:42	2	13:52 (B0023)	07:57	4	15:51 (B0021)	06:48	7	16:38 (B0020)	06:22	9	19:07 (B0025)	05:04	10	19:52 (B0017)	04:07		
	15:27		13:54 (B0023)	16:30			15:55 (B0021)		17:36			19:45			19:16 (B0025)	20:51	20:02 (B0017)	21:50
5	08:41			07:55		15:50 (B0021)	06:46			06:20		19:06 (B0025)	05:01		19:54 (B0017)	04:06		
	15:28			16:33		8	15:58 (B0021)		17:38			19:47	11		19:17 (B0025)	20:53	6	20:00 (B0017)
6	08:41			07:53		15:49 (B0021)	06:43			06:17		19:06 (B0025)	04:59			04:05		
	15:30			16:35		11	16:00 (B0021)		17:40			19:49	13		19:19 (B0025)	20:55		21:52
7	08:40			07:51		15:49 (B0021)	06:40			06:14		19:06 (B0025)	04:57			04:04		
	15:31			16:37		14	16:03 (B0021)		17:43			19:51	12		19:18 (B0025)	20:57		21:53
8	08:39			07:49		15:48 (B0021)	06:37			06:11		19:08 (B0025)	04:54			04:03		
	15:33			16:40		16	16:04 (B0021)		17:45			19:53	9		19:17 (B0025)	20:59		21:55
9	08:39			07:46		15:48 (B0021)	06:35			06:09		19:09 (B0025)	04:52			04:02		
	15:35			16:42		17	16:05 (B0021)		17:47			19:56	5		19:14 (B0025)	21:02		21:56
10	08:38			07:44		15:48 (B0021)	06:32			06:06			04:50			04:01		
	15:37			16:45		17	16:05 (B0021)		17:49			19:58			21:04		21:57	
11	08:37			07:42		15:49 (B0021)	06:29			06:03	6	19:24 (B0018)	04:48			04:01		
	15:38			16:47		16	16:05 (B0021)		17:52			20:00			19:30 (B0018)	21:06		21:58
12	08:36			07:39		15:49 (B0021)	06:26			06:00		19:21 (B0018)	04:45			04:00		
	15:40			16:49		15	16:04 (B0021)		17:54			20:02	11		19:32 (B0018)	21:08		21:59
13	08:35			07:37		15:51 (B0021)	06:24			05:58		19:19 (B0018)	04:43			04:00		
	15:42			16:52		13	16:04 (B0021)		17:56			20:04	15		19:34 (B0018)	21:10		22:00
14	08:33			07:35		15:52 (B0021)	06:21			05:55		19:19 (B0018)	04:41			03:59		
	15:44			16:54		10	16:02 (B0021)		17:58			20:07	17		19:36 (B0018)	21:12		22:00
15	08:32			07:32		15:55 (B0021)	06:18			05:52		19:18 (B0018)	04:39			03:59		
	15:46			16:56		3	15:58 (B0021)		18:01			20:09	19		19:37 (B0018)	21:14		22:01
16	08:31			07:30			06:15			05:50		19:16 (B0018)	04:37			03:59		
	15:48			16:59					18:03			20:11	21		19:37 (B0018)	21:16		22:02
17	08:30			07:27			06:13			05:47		19:17 (B0018)	04:35			03:58		
	15:50			17:01					18:05			20:13	20		19:37 (B0018)	21:18		22:02
18	08:28			07:25			06:10			05:44		19:16 (B0018)	04:33			03:58		
	15:52			17:03					18:07			20:16	20		19:36 (B0018)	21:20		22:03
19	08:27			07:22			06:07			05:42		19:17 (B0018)	04:31			03:58		
	15:54			17:06					18:10			20:18	19		19:36 (B0018)	21:22		22:03
20	08:25			07:20			06:04			05:39		19:17 (B0018)	04:29			03:58		
	15:56			17:08					18:12			20:20	18		19:35 (B0018)	21:24		22:04
21	08:24			07:17			06:01			05:36		19:18 (B0018)	04:27			03:58		
	15:58			17:11					18:14			20:22	17		19:35 (B0018)	21:26		22:04
22	08:22			07:15			05:59			05:34		19:18 (B0018)	04:26			03:59		
	16:01			17:13					18:16			20:24	15		19:33 (B0018)	21:28		22:04
23	08:21			07:12		16:38 (B0020)	05:56		17:45 (B0019)	05:31		19:20 (B0018)	04:24			03:59		
	16:03			17:15		6	16:44 (B0020)		18:18	4		17:49 (B0019)	20:27		12	19:32 (B0018)	21:30	
24	08:19			07:09		16:36 (B0020)	05:53		17:43 (B0019)	05:28		19:22 (B0018)	04:22			03:59		
	16:05			17:17		10	16:46 (B0020)		18:21	8		17:51 (B0019)	20:29		9	19:56 (B0017)	21:32	
25	08:17			07:07		16:36 (B0020)	05:50		17:42 (B0019)	05:26		19:53 (B0017)	04:20			04:00		
	16:07			17:20		13	16:49 (B0020)		18:23	11		17:53 (B0019)	20:31		6	19:59 (B0017)	21:34	
26	08:15			07:04		16:35 (B0020)	05:47		17:41 (B0019)	05:23		19:52 (B0017)	04:19			04:00		
	16:09			17:22		16	16:51 (B0020)		18:25	14		17:55 (B0019)	20:33		9	20:01 (B0017)	21:35	
27	08:13			07:02		16:34 (B0020)	05:45		17:42 (B0019)	05:21		19:50 (B0017)	04:17			04:01		
	16:12			17:24		17	16:51 (B0020)		18:27	15		17:57 (B0019)	20:35		13	20:03 (B0017)	21:37	
28	08:12			06:59		16:34 (B0020)	05:42		17:42 (B0019)	05:18		19:50 (B0017)	04:16			04:01		
	16:14			17:27		16	16:50 (B0020)		18:29	14		17:56 (B0019)	20:38		15	20:05 (B0017)	21:39	
29	08:10						06:39		18:43 (B0019)	05:16		19:49 (B0017)	04:14			04:02		
	16:16								19:31	11		18:54 (B0019)	20:40		16	20:05 (B0017)	21:41	
30	08:08						06:36		18:44 (B0019)	05:13		19:50 (B0017)	04:13			04:03		
	16:19								19:34	8		18:52 (B0019)	20:42		15	20:05 (B0017)	21:42	
31	08:06						06:34						04:12					
	16:21								19:36								21:44	
Potential sun hours	228			262			366			429			515			539		
Total, worst case	27			222			133			360			57					
Sun reduction	0,19			0,16			0,22			0,42			0,53					
Oper. time red.	0,99			0,99			0,99			0,99			0,99					
Wind dir. red.	0,69			0,69			0,66			0,61			0,60					
Total reduction	0,13			0,11			0,15			0,26			0,32					
Total, real	3			25			20			94			18					

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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SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:16>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (870)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VÄXJO /KRONÖBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:23 (B0018) 19:29 (B0018)	07:01 18:36	07:10 16:15
2	04:04 22:02	04:55 21:16	06:00 19:57	07:04 18:34	07:04 16:13	15:34 (B0021) 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:07 (B0025) 19:12 (B0025)	07:06 18:31	07:15 16:10
4	04:06 22:01	04:59 21:11	06:04 19:52	19:05 (B0025) 19:14 (B0025)	07:08 18:28	15:18 (B0021) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:03 (B0025) 19:15 (B0025)	07:10 18:25	15:19 (B0021) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	19:02 (B0025) 19:15 (B0025)	07:12 18:23	15:20 (B0021) 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	19:02 (B0025) 19:13 (B0025)	07:14 18:20	15:22 (B0021) 15:15
8	04:11 21:57	05:07 21:02	20:03 (B0017) 20:11 (B0017)	06:13 19:41	19:01 (B0025) 19:10 (B0025)	07:17 15:59
9	04:12 21:56	05:09 21:00	20:01 (B0017) 20:12 (B0017)	06:15 19:38	19:01 (B0025) 19:07 (B0025)	07:19 18:14
10	04:13 21:55	05:11 20:57	20:00 (B0017) 20:13 (B0017)	06:17 19:35	19:02 (B0025) 19:04 (B0025)	07:21 18:12
11	04:15 21:54	05:13 20:55	19:59 (B0017) 20:14 (B0017)	06:19 19:32	17:12 (B0020) 17:22 (B0020)	15:57 15:51
12	04:16 21:53	05:15 20:52	19:58 (B0017) 20:14 (B0017)	06:21 19:30	17:09 (B0020) 17:24 (B0020)	07:36 15:51
13	04:18 21:52	05:18 20:50	19:58 (B0017) 20:14 (B0017)	06:23 19:27	18:06 18:36 (B0019)	15:51 15:49
14	04:19 21:50	05:20 20:48	19:58 (B0017) 20:14 (B0017)	06:25 19:24	17:07 (B0020) 18:01 (B0019)	07:40 15:47
15	04:21 21:49	05:22 20:45	19:58 (B0017) 20:12 (B0017)	06:28 19:21	17:07 (B0020) 17:23 (B0020)	07:42 15:45
16	04:23 21:47	05:24 20:43	19:58 (B0017) 20:10 (B0017)	06:30 19:18	18:31 (B0019) 18:45 (B0019)	07:45 15:43
17	04:24 21:46	05:26 20:40	19:59 (B0017) 20:07 (B0017)	06:32 19:16	17:07 (B0020) 18:30 (B0019)	07:47 15:41
18	04:26 21:44	05:28 20:37	19:59 (B0017) 20:05 (B0017)	06:34 19:13	17:09 (B0020) 17:17 (B0020)	07:49 15:39
19	04:28 21:43	05:30 20:35	19:28 (B0018) 20:02 (B0017)	06:36 19:10	17:10 (B0020) 18:39 (B0019)	07:51 15:38
20	04:29 21:41	05:33 20:32	19:25 (B0018) 19:38 (B0018)	06:38 19:07	17:14 (B0020) 18:37 (B0019)	07:53 15:36
21	04:31 21:39	05:35 20:30	19:23 (B0018) 19:39 (B0018)	06:40 19:04	17:45 18:32 (B0019)	07:56 15:34
22	04:33 21:38	05:37 20:27	19:22 (B0018) 19:40 (B0018)	06:42 19:02	17:42 17:40	15:34 15:33
23	04:35 21:36	05:39 20:24	19:21 (B0018) 19:40 (B0018)	06:44 18:59	07:48 17:37	07:58 15:31
24	04:37 21:34	05:41 20:22	19:20 (B0018) 19:40 (B0018)	06:47 18:56	07:52 17:35	08:02 15:30
25	04:39 21:32	05:43 20:19	19:20 (B0018) 19:40 (B0018)	06:49 18:53	08:04 16:32	15:28 15:28
26	04:41 21:30	05:45 20:16	19:19 (B0018) 19:40 (B0018)	06:51 18:50	08:06 16:30	15:27 15:27
27	04:42 21:28	05:47 20:14	19:19 (B0018) 19:39 (B0018)	06:53 18:48	08:08 16:27	15:24 (B0021) 15:25
28	04:44 21:26	05:50 20:11	19:19 (B0018) 19:39 (B0018)	06:55 18:45	08:10 16:25	15:21 (B0021) 15:24
29	04:46 21:24	05:52 20:08	19:20 (B0018) 19:37 (B0018)	06:57 18:42	08:12 16:22	15:20 (B0021) 15:23
30	04:48 21:22	05:54 20:06	19:20 (B0018) 19:34 (B0018)	06:59 18:39	08:14 16:20	15:19 (B0021) 15:22
31	04:50 21:20	05:56 20:03	19:21 (B0018) 19:32 (B0018)	07:08 18:39	08:16 16:17	15:19 (B0021) 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		353	161	188	83	287
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,61	0,64	0,69	0,69	0,69
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		76	33	34	10	26

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (833)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	06:31 19:38	18:25 (B0018) 20:44 (B0018)	05:11 21:45
2	08:43 15:24	08:02 16:26	06:54 17:31	06:28 19:40	18:28 (B0018) 20:46 (B0018)	05:08 21:47
3	08:42 15:26	08:00 16:28	06:51 17:34	06:25 19:42	18:34 (B0018) 20:49 (B0012)	05:06 21:48
4	08:41 15:27	07:57 16:30	06:48 17:36	06:22 19:45	19:10 (B0012) 20:51 (B0012)	05:04 21:50
5	08:41 15:28	07:55 16:37	06:46 17:38	06:20 19:47	19:16 (B0012) 20:53 (B0012)	05:01 21:51
6	08:41 15:30	07:53 16:35	06:43 17:40	06:17 19:49	17:04 (B0019) 20:55 (B0012)	04:59 21:52
7	08:40 15:31	07:51 16:37	06:40 17:43	06:14 19:51	17:03 (B0019) 20:57 (B0012)	04:57 21:54
8	08:39 15:33	07:49 16:40	06:37 17:45	06:11 19:53	17:09 (B0019) 20:59 (B0012)	04:54 21:55
9	08:39 15:35	07:46 16:42	06:35 17:47	06:09 19:56	17:11 (B0019) 21:02 (B0017)	04:52 21:56
10	08:38 15:37	07:44 16:45	06:32 17:49	06:06 19:58	17:13 (B0019) 21:04 (B0017)	04:50 21:57
11	08:37 15:38	07:42 16:47	06:29 17:52	06:03 20:00	17:14 (B0019) 21:06 (B0017)	04:48 21:58
12	08:36 15:40	07:39 16:49	06:26 17:54	06:00 20:02	17:15 (B0019) 21:08 (B0017)	04:45 21:59
13	08:35 15:42	07:37 16:52	06:24 17:56	05:58 20:04	17:16 (B0019) 21:10 (B0017)	04:43 22:00
14	08:33 15:44	07:35 16:54	06:21 17:58	05:55 20:07	17:12 (B0019) 21:12 (B0017)	04:41 22:01
15	08:32 15:46	07:32 16:56	06:18 18:01	05:52 20:09	17:10 (B0019) 21:14 (B0017)	04:39 22:02
16	08:31 15:48	07:30 16:59	06:15 18:03	05:50 20:11	17:09 (B0019) 21:16 (B0017)	04:37 22:03
17	08:30 15:50	07:27 17:01	06:13 18:05	05:47 20:13	17:08 (B0019) 21:18 (B0017)	04:35 22:04
18	08:28 15:52	07:25 17:03	06:10 18:07	05:44 20:16	17:07 (B0019) 21:20 (B0017)	04:33 22:05
19	08:27 15:54	07:22 17:06	06:07 18:10	05:42 20:18	17:06 (B0019) 21:22 (B0017)	04:31 22:06
20	08:25 15:56	07:20 17:08	06:04 18:12	05:39 20:20	17:05 (B0019) 21:24 (B0017)	04:29 22:07
21	08:24 15:58	07:17 17:11	06:01 18:14	05:36 20:22	17:04 (B0019) 21:26 (B0017)	04:27 22:08
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:24	17:03 (B0019) 21:28 (B0017)	04:26 22:09
23	08:21 16:03	07:12 17:15	05:56 18:18	05:31 20:27	17:02 (B0019) 21:30 (B0017)	04:24 22:10
24	08:19 16:05	07:09 17:17	05:53 18:21	05:28 20:29	17:01 (B0019) 21:32 (B0017)	04:22 22:11
25	08:17 16:07	07:07 17:20	05:50 18:23	05:26 20:31	17:00 (B0019) 21:34 (B0017)	04:20 22:12
26	08:15 16:09	07:04 17:22	05:47 18:25	05:23 20:33	16:59 (B0021) 21:36 (B0017)	04:19 22:13
27	08:14 16:12	07:02 17:24	05:45 18:27	05:21 20:35	15:03 (B0021) 21:38 (B0017)	04:17 22:14
28	08:12 16:14	06:59 17:27	05:42 18:29	05:18 20:38	15:07 (B0021) 21:40 (B0017)	04:16 22:15
29	08:10 16:16		06:39 19:32	05:16 20:40		04:14 22:16
30	08:08 16:19		06:36 19:34	05:13 20:42		04:13 22:17
31	08:06 16:21		06:34 19:36	05:11 20:44		04:12 22:18
Potential sun hours	228	262	366	429	515	539
Total, worst case	179	145	369	270		
Sun reduction	0,19	0,16	0,22	0,42		
Oper. time red.	0,99	0,99	0,99	0,99		
Wind dir. red.	0,69	0,69	0,66	0,63		
Total reduction	0,13	0,11	0,15	0,27		
Total, real	23	16	54	72		

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (833)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September		October		November		December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:07 (B0012) 20	07:01 18:36	17:41 (B0019) 12	07:10 16:15	15:14 (B0020) 16	08:16 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	19:05 (B0012) 21	07:04 18:34	17:39 (B0019) 14	07:13 16:13	15:14 (B0020) 17	08:17 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:03 (B0012) 21	07:06 18:31	17:38 (B0019) 15	07:15 16:10	15:14 (B0020) 16	08:19 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	19:02 (B0012) 19	07:08 18:28	17:38 (B0019) 16	07:17 16:08	15:14 (B0020) 16	08:21 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:02 (B0012) 16	07:10 18:25	17:38 (B0019) 16	07:20 16:06	15:14 (B0020) 15	08:23 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	19:02 (B0012) 13	07:12 18:23	17:37 (B0019) 14	07:22 16:04	15:15 (B0020) 12	08:24 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	19:02 (B0012) 11	07:14 18:20	17:37 (B0019) 11	07:24 16:01	15:17 (B0020) 8	08:26 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	19:03 (B0012) 7	07:17 18:17	17:38 (B0019) 6	07:27 15:59	15:18 (B0020) 4	08:27 15:15
9	04:12 21:56	05:09 21:00	06:15 19:38	19:04 (B0012) 3	07:19 18:14	17:40 (B0019) 2	07:29 15:57	15:22 (B0020)	08:29 15:14
10	04:13 21:55	05:11 20:57	06:17 19:35	18:22 (B0018) 5	07:21 18:12		07:31 15:55		08:30 15:14
11	04:15 21:54	05:13 20:55	06:19 19:32	18:18 (B0018) 12	07:23 18:09		07:33 15:53		08:32 15:13
12	04:16 21:53	05:15 20:53	06:21 19:30	18:15 (B0018) 17	07:25 18:06		07:36 15:51		08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 19:27	18:13 (B0018) 19	07:28 18:03		07:38 15:49		08:34 15:13
14	04:19 21:50	05:20 20:48	06:25 19:24	18:12 (B0018) 21	07:30 18:01		07:40 15:47		08:35 15:12
15	04:21 21:49	05:22 20:45	06:28 19:21	18:11 (B0018) 22	07:32 17:58		07:42 15:45	14:36 (B0021) 4	08:36 15:12
16	04:23 21:47	05:24 20:43	06:30 19:18	18:10 (B0018) 23	07:34 17:55		07:45 15:43	14:34 (B0021) 9	08:37 15:12
17	04:24 21:46	05:26 20:40	06:32 19:16	18:09 (B0018) 24	07:36 17:53		07:47 15:41	14:32 (B0021) 12	08:38 15:12
18	04:26 21:44	05:28 20:37	06:34 19:13	18:09 (B0018) 23	07:39 17:50		07:49 15:39	14:44 (B0021) 13	08:39 15:13
19	04:28 21:43	05:30 20:35	06:36 19:10	18:09 (B0018) 22	07:41 17:48		07:51 15:38	14:45 (B0021) 15	08:40 15:13
20	04:29 21:41	05:33 20:32	06:38 19:07	18:10 (B0018) 22	07:43 17:45		07:53 15:36	14:32 (B0021) 15	08:41 15:13
21	04:31 21:39	05:35 20:30	06:40 19:04	18:10 (B0018) 22	07:45 17:42		07:56 15:34	14:47 (B0021) 16	08:41 15:13
22	04:33 21:38	05:37 20:27	06:42 19:02	18:10 (B0018) 21	07:48 17:40		07:58 15:33	14:31 (B0021) 16	08:42 15:14
23	04:35 21:36	05:39 20:24	06:44 18:59	18:11 (B0018) 17	07:50 17:37		08:00 15:31	14:47 (B0021) 16	08:42 15:14
24	04:37 21:34	05:41 20:22	06:47 19:25 (B0017)	18:13 (B0018) 12	07:52 17:35		08:02 15:30	14:32 (B0021) 15	08:43 15:15
25	04:39 21:32	05:43 20:19	06:49 19:15 (B0017)	18:18 (B0025) 4	06:54 16:32		08:04 15:28	14:33 (B0021) 14	08:43 15:16
26	04:41 21:30	05:45 20:16	06:51 19:14 (B0017)	18:22 (B0025) 14	06:57 16:30		08:06 15:27	14:47 (B0021) 12	08:43 15:16
27	04:42 21:28	05:47 20:14	06:53 19:12 (B0017)	18:50 17	06:59 16:27		08:08 15:25	14:45 (B0021) 10	08:43 15:17
28	04:44 21:26	05:50 20:11	06:55 19:11 (B0017)	18:48 18	07:01 16:25	15:19 (B0020) 6	08:10 15:24	14:34 (B0021) 7	08:43 15:18
29	04:46 21:24	05:52 20:08	06:57 19:11 (B0017)	18:45 18	07:04 16:22	15:17 (B0020) 11	08:12 15:23	14:36 (B0021) 4	08:44 15:19
30	04:48 21:22	05:54 20:06	06:59 19:10 (B0017)	18:42 7	07:06 17:51 (B0019)	15:28 (B0020) 13	08:14 15:22	14:40 (B0021) 2	08:43 15:20
31	04:50 21:20	05:56 20:03	19:10 (B0017) 18	19:29 (B0017) 18	07:08 16:17	15:15 (B0020) 15	15:22 15:30 (B0020)	14:39 (B0021)	08:43 15:21
Potential sun hours	538	474	386		321		241		207
Total, worst case		123	424		151		284		
Sun reduction		0,35	0,31		0,26		0,17		
Oper. time red.		0,99	0,99		0,99		0,99		
Wind dir. red.		0,62	0,65		0,67		0,69		
Total reduction		0,22	0,20		0,17		0,12		
Total, real		27	86		26		34		

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:18>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (834)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	15:42 (B0021) 17:29	16:31 (B0020) 19:38	19:06 (B0025) 20:44	19:48 (B0017) 21:45
2	08:43 15:24	08:02 16:26	15:41 (B0021) 17:31	16:34 (B0020) 19:40	19:05 (B0025) 20:46	19:49 (B0017) 21:47
3	08:42 15:26	08:00 16:28	15:40 (B0021) 17:34	16:38 (B0020) 19:42	19:11 (B0025) 20:49	19:49 (B0017) 21:48
4	08:42 15:27	07:57 16:30	15:40 (B0021) 17:36	19:04 (B0025) 20:51	19:13 (B0025) 20:50	19:51 (B0017) 21:50
5	08:41 15:28	07:55 16:33	15:40 (B0021) 17:38	19:04 (B0025) 20:53	19:16 (B0025) 20:51	19:54 (B0017) 21:51
6	08:41 15:30	07:53 16:35	15:40 (B0021) 17:40	19:17 (B0025) 20:55	19:04 (B0025) 20:57	19:57 (B0017) 21:52
7	08:40 15:31	07:51 16:37	15:41 (B0021) 17:43	19:15 (B0025) 20:57	19:04 (B0025) 20:57	19:54 (B0017) 21:54
8	08:39 15:33	07:49 16:40	15:41 (B0021) 17:45	19:07 (B0025) 20:59	19:14 (B0025) 20:59	19:54 (B0017) 21:55
9	08:39 15:35	07:46 16:42	15:42 (B0021) 17:47	19:12 (B0025) 21:02	19:07 (B0025) 21:02	19:54 (B0017) 21:56
10	08:38 15:37	07:44 16:45	15:42 (B0021) 17:49	19:22 (B0018) 21:04	19:26 (B0018) 21:04	19:54 (B0017) 21:57
11	08:37 15:38	07:42 16:47	15:44 (B0021) 17:52	19:18 (B0018) 21:06	19:27 (B0018) 21:06	19:54 (B0017) 21:58
12	08:36 15:40	07:39 16:49	15:47 (B0021) 17:54	19:17 (B0018) 21:08	19:30 (B0018) 21:08	19:54 (B0017) 21:59
13	08:35 15:42	07:37 16:52	15:52 (B0021) 17:56	19:15 (B0018) 21:10	19:32 (B0018) 21:10	19:54 (B0017) 22:00
14	08:33 15:44	07:35 16:54	17:56 17:58	19:14 (B0018) 21:12	19:33 (B0018) 21:12	19:54 (B0017) 22:00
15	08:32 15:46	07:32 16:56	17:58 18:01	19:13 (B0018) 21:14	19:34 (B0018) 21:14	19:54 (B0017) 22:01
16	08:31 15:48	07:30 16:59	18:01 18:03	19:12 (B0018) 21:16	19:34 (B0018) 21:16	19:54 (B0017) 22:02
17	08:30 15:50	07:27 17:01	18:03 18:05	19:12 (B0018) 21:18	19:40 (B0012) 21:18	19:54 (B0017) 22:02
18	08:28 15:52	07:25 17:03	18:05 18:07	19:13 (B0018) 21:20	19:42 (B0012) 21:20	19:54 (B0017) 22:03
19	08:27 15:54	07:22 17:06	18:07 18:10	19:12 (B0018) 21:22	19:44 (B0012) 21:22	19:54 (B0017) 22:03
20	08:25 15:56	07:20 17:08	18:10 18:12	19:13 (B0018) 21:24	19:47 (B0012) 21:24	19:54 (B0017) 22:04
21	08:24 15:58	07:17 17:11	18:12 18:14	19:15 (B0018) 21:26	19:47 (B0012) 21:26	19:54 (B0017) 22:04
22	08:22 16:01	07:15 17:13	18:14 18:16	19:16 (B0018) 21:28	19:48 (B0012) 21:28	19:54 (B0017) 22:04
23	08:21 16:03	07:12 17:15	18:16 18:18	19:17 (B0018) 21:30	19:49 (B0012) 21:30	19:54 (B0017) 22:04
24	08:19 16:05	07:09 17:17	18:18 18:21	19:18 (B0018) 21:32	19:51 (B0017) 21:32	19:54 (B0017) 22:04
25	08:17 16:07	07:07 17:20	18:21 18:23	19:19 (B0018) 21:34	19:52 (B0017) 21:34	19:54 (B0017) 22:04
26	08:15 16:09	07:04 17:22	18:23 18:25	19:20 (B0018) 21:36	19:53 (B0017) 21:36	19:54 (B0017) 22:04
27	08:13 16:12	07:02 17:24	18:25 18:27	19:21 (B0018) 21:38	19:54 (B0017) 21:38	19:54 (B0017) 22:04
28	08:12 16:14	06:59 17:27	18:27 18:29	19:22 (B0018) 21:40	19:55 (B0017) 21:40	19:54 (B0017) 22:04
29	08:10 16:16		18:30 18:32	19:23 (B0018) 21:42	19:56 (B0017) 21:42	19:54 (B0017) 22:04
30	08:08 16:19		18:32 18:34	19:24 (B0018) 21:44	19:57 (B0017) 21:44	19:54 (B0017) 22:04
31	08:06 16:21	15:43 (B0021) 15:44 (B0021)	18:34 18:36	19:25 (B0018) 21:46	19:58 (B0017) 21:46	19:54 (B0017) 22:04
Potential sun hours	228	262	366	429	515	539
Total, worst case	1	269	105	470	54	
Sun reduction	0,19	0,16	0,22	0,42	0,53	
Oper. time red.	0,99	0,99	0,99	0,99	0,99	
Wind dir. red.	0,69	0,69	0,66	0,61	0,60	
Total reduction	0,13	0,11	0,15	0,26	0,32	
Total, real	0	30	15	123	17	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:18>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (834)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:16 (B0018) 18:36	07:10 16:15	15:12 (B0021) 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	19:17 (B0018) 18:34	07:04 16:13	15:11 (B0021) 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:20 (B0018) 18:31	07:06 16:10	15:10 (B0021) 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	19:04 (B0025) 18:28	07:08 16:08	15:10 (B0021) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:02 (B0025) 18:25	07:10 16:06	15:10 (B0021) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	19:00 (B0025) 18:23	07:12 16:04	15:10 (B0021) 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	18:59 (B0025) 18:20	07:14 16:01	15:11 (B0021) 15:15
8	04:11 21:57	05:07 21:02	20:02 (B0017) 19:41	06:13 18:58 (B0025)	07:17 15:59	15:11 (B0021) 15:15
9	04:12 21:56	05:09 21:00	20:00 (B0017) 19:38	06:15 18:58 (B0025)	07:19 15:57	15:12 (B0021) 15:14
10	04:13 21:55	05:11 20:57	19:58 (B0017) 20:11 (B0017)	06:17 19:35	07:21 15:55	15:13 (B0021) 15:14
11	04:15 21:54	05:13 20:55	19:57 (B0017) 20:12 (B0017)	06:19 19:32	07:23 18:09	08:31 15:53
12	04:16 21:53	05:15 20:52	19:57 (B0017) 20:12 (B0017)	06:21 19:30	07:25 18:06	08:33 15:51
13	04:18 21:52	05:18 20:50	19:56 (B0017) 20:12 (B0017)	06:23 19:27	07:28 18:03	08:34 15:49
14	04:19 21:50	05:20 20:48	19:56 (B0017) 20:12 (B0017)	06:25 19:24	18:33 (B0019) 18:01	07:30 17:16 (B0020)
15	04:21 21:49	05:22 20:45	19:56 (B0017) 20:12 (B0017)	06:28 19:21	18:30 (B0019) 17:58	07:32 17:00 (B0020)
16	04:23 21:47	05:24 20:43	19:56 (B0017) 20:10 (B0017)	06:30 19:18	18:28 (B0019) 17:55	07:34 17:17 (B0020)
17	04:24 21:46	05:26 20:40	19:56 (B0017) 20:07 (B0017)	06:32 19:16	18:26 (B0019) 17:53	07:36 17:16 (B0020)
18	04:26 21:44	05:28 20:37	19:57 (B0017) 20:05 (B0017)	06:34 19:13	18:25 (B0019) 17:50	07:39 17:16 (B0020)
19	04:28 21:43	05:30 20:35	19:58 (B0017) 20:02 (B0017)	06:36 19:10	18:25 (B0019) 17:48	07:41 17:14 (B0020)
20	04:29 21:41	05:33 20:32	19:24 (B0018) 19:50 (B0012)	06:38 19:07	18:25 (B0019) 17:45	07:43 17:11 (B0020)
21	04:31 21:39	05:35 20:30	19:21 (B0018) 19:51 (B0012)	06:40 19:04	18:26 (B0019) 17:42	07:45 17:09 (B0020)
22	04:33 21:38	05:37 20:27	19:19 (B0018) 19:51 (B0012)	06:42 19:02	18:26 (B0019) 17:40	07:48 17:04 (B0020)
23	04:35 21:36	05:39 20:24	19:18 (B0018) 19:52 (B0012)	06:44 18:59	18:27 (B0019) 17:37	07:50 15:31
24	04:37 21:34	05:41 20:22	19:17 (B0018) 19:50 (B0012)	06:47 18:56	07:52 17:35	08:02 15:30
25	04:39 21:32	05:43 20:19	19:16 (B0018) 19:47 (B0012)	06:49 18:53	06:54 16:32	08:04 15:28
26	04:41 21:30	05:45 20:16	19:15 (B0018) 19:45 (B0012)	06:51 18:50	06:57 16:30	08:06 15:27
27	04:42 21:28	05:47 20:14	19:15 (B0018) 19:42 (B0012)	06:53 18:48	06:59 16:27	08:08 15:25
28	04:44 21:26	05:50 20:11	19:15 (B0018) 19:36 (B0018)	06:55 18:45	07:01 16:25	08:10 15:24
29	04:46 21:24	05:52 20:08	19:15 (B0018) 19:35 (B0018)	06:57 18:42	07:04 16:22	08:12 15:23
30	04:48 21:22	05:54 20:06	19:15 (B0018) 19:34 (B0018)	06:59 18:39	07:06 16:20	15:15 (B0021) 15:22
31	04:50 21:20	05:56 20:03	19:15 (B0018) 19:32 (B0018)	07:08 16:17	07:08 15:13 (B0021)	08:14 15:24 (B0021)
Potential sun hours	538	474	386	321	241	207
Total, worst case		429	190	153	132	8
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,61	0,64	0,69	0,69	0,68
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		92	38	27	16	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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:19>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (844)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

	January			February			March			April			May			June		
1	08:43			08:04	15:39 (B0021)	06:56		16:31 (B0020)	06:31	19:04 (B0025)	05:11		19:47 (B0017)	04:10				
	15:23			16:23	8 15:47 (B0021)	17:29	6	16:37 (B0020)	19:38	5 19:09 (B0025)	20:44	14	20:01 (B0017)	21:45				
2	08:43			08:02	15:39 (B0021)	06:54			06:28	19:03 (B0025)	05:08		19:48 (B0017)	04:09				
	15:24			16:26	11 15:50 (B0021)	17:31			19:40	8 19:11 (B0025)	20:46	13	20:01 (B0017)	21:47				
3	08:42			08:00	15:38 (B0021)	06:51			06:25	19:02 (B0025)	05:06		19:49 (B0017)	04:08				
	15:26			16:28	14 15:52 (B0021)	17:34			19:42	11 19:13 (B0025)	20:49	9	19:58 (B0017)	21:48				
4	08:42			07:57	15:38 (B0021)	06:48			06:22	19:02 (B0025)	05:04		19:51 (B0017)	04:07				
	15:27			16:30	17 15:55 (B0021)	17:36			19:45	14 19:16 (B0025)	20:51	5	19:56 (B0017)	21:50				
5	08:41			07:55	15:38 (B0021)	06:46			06:20	19:02 (B0025)	05:01			04:06				
	15:28			16:33	17 15:55 (B0021)	17:38			19:47	13 19:15 (B0025)	20:53			21:51				
6	08:41			07:53	15:38 (B0021)	06:43			06:17	19:03 (B0025)	04:59			04:05				
	15:30			16:35	17 15:55 (B0021)	17:40			19:49	10 19:13 (B0025)	20:55			21:52				
7	08:40			07:51	15:39 (B0021)	06:40			06:14	19:04 (B0025)	04:57			04:04				
	15:31			16:37	16 15:55 (B0021)	17:43			19:51	7 19:11 (B0025)	20:57			21:54				
8	08:39			07:49	15:39 (B0021)	06:37			06:11	19:20 (B0018)	04:54			04:03				
	15:33			16:40	15 15:54 (B0021)	17:45			19:53	4 19:24 (B0018)	20:59			21:55				
9	08:39			07:46	15:40 (B0021)	06:35			06:09	19:16 (B0018)	04:52			04:02				
	15:35			16:42	14 15:54 (B0021)	17:47			19:56	10 19:26 (B0018)	21:02			21:56				
10	08:38			07:44	15:41 (B0021)	06:32			06:06	19:14 (B0018)	04:50			04:01				
	15:37			16:45	11 15:52 (B0021)	17:49			19:58	13 19:27 (B0018)	21:04			21:57				
11	08:37			07:42	15:44 (B0021)	06:29			06:03	19:13 (B0018)	04:48			04:01				
	15:38			16:47	7 15:51 (B0021)	17:52			20:00	17 19:30 (B0018)	21:06			21:58				
12	08:36			07:39		06:26			06:00	19:12 (B0018)	04:45			04:00				
	15:40			16:49		17:54			20:02	20 19:32 (B0018)	21:08			21:59				
13	08:35			07:37		06:24			05:58	19:11 (B0018)	04:43			04:00				
	15:42			16:52		17:56			20:04	21 19:32 (B0018)	21:10			22:00				
14	08:33			07:35		06:21			05:55	19:11 (B0018)	04:41			03:59				
	15:44			16:54		17:58			20:07	21 19:32 (B0018)	21:12			22:00				
15	08:32			07:32		06:18			05:52	19:10 (B0018)	04:39			03:59				
	15:46			16:56		18:01			20:09	24 19:38 (B0012)	21:14			22:01				
16	08:31			07:30		06:15			05:50	19:10 (B0018)	04:37			03:59				
	15:48			16:59		18:03			20:11	27 19:40 (B0012)	21:16			22:02				
17	08:30			07:27		06:13			05:47	19:10 (B0018)	04:35			03:58				
	15:50			17:01		18:05			20:13	29 19:42 (B0012)	21:18			22:02				
18	08:28			07:25		06:10			05:44	19:10 (B0018)	04:33			03:58				
	15:52			17:03		18:07			20:16	31 19:44 (B0012)	21:20			22:03				
19	08:27			07:22	16:31 (B0020)	06:07			05:42	19:12 (B0018)	04:31			03:58				
	15:54			17:06	3 16:34 (B0020)	18:10			20:18	30 19:46 (B0012)	21:22			22:03				
20	08:25			07:20	16:29 (B0020)	06:04		17:40 (B0019)	05:39	19:12 (B0018)	04:29			03:58				
	15:56			17:08	7 16:36 (B0020)	18:12	2	17:42 (B0019)	20:20	27 19:45 (B0012)	21:24			22:04				
21	08:24			07:17	16:27 (B0020)	06:01		17:38 (B0019)	05:36	19:14 (B0018)	04:27			03:58				
	15:58			17:11	12 16:39 (B0020)	18:14	6	17:44 (B0019)	20:22	23 19:45 (B0012)	21:26			22:04				
22	08:22			07:15	16:27 (B0020)	05:59		17:38 (B0019)	05:34	19:17 (B0018)	04:26			03:59				
	16:01			17:13	15 16:42 (B0020)	18:16	9	17:47 (B0019)	20:24	14 19:43 (B0012)	21:28			22:04				
23	08:21			07:12	16:26 (B0020)	05:56		17:37 (B0019)	05:31	19:37 (B0012)	04:24			03:59				
	16:03			17:15	16 16:42 (B0020)	18:18	12	17:49 (B0019)	20:27	9 19:55 (B0017)	21:30			22:04				
24	08:19			07:09	16:26 (B0020)	05:53		17:36 (B0019)	05:28	19:48 (B0017)	04:22			03:59				
	16:05			17:17	16 16:42 (B0020)	18:21	15	17:51 (B0019)	20:29	8 19:56 (B0017)	21:32			22:04				
25	08:17			07:07	16:26 (B0020)	05:50		17:36 (B0019)	05:26	19:47 (B0017)	04:20			04:00				
	16:07			17:20	17 16:43 (B0020)	18:23	15	17:51 (B0019)	20:31	12 19:59 (B0017)	21:34			22:04				
26	08:15			07:04	16:26 (B0020)	05:47		17:36 (B0019)	05:23	19:47 (B0017)	04:19			04:00				
	16:09			17:22	16 16:42 (B0020)	18:25	14	17:50 (B0019)	20:33	14 20:01 (B0017)	21:35			22:04				
27	08:13			07:02	16:27 (B0020)	05:45		17:38 (B0019)	05:21	19:46 (B0017)	04:17			04:01				
	16:12			17:24	14 16:41 (B0020)	18:27	11	17:49 (B0019)	20:35	17 20:03 (B0017)	21:37			22:04				
28	08:12			06:59	16:28 (B0020)	05:42		17:40 (B0019)	05:18	19:46 (B0017)	04:16			04:01				
	16:14			17:27	11 16:39 (B0020)	18:29	6	17:46 (B0019)	20:38	17 20:03 (B0017)	21:39			22:04				
29	08:10					06:39			05:16	19:46 (B0017)	04:14			04:02				
	16:16					19:32			20:40	16 20:02 (B0017)	21:41			22:03				
30	08:08					06:36			05:13	19:46 (B0017)	04:13			04:03				
	16:19					19:34			20:42	16 20:02 (B0017)	21:42			22:03				
31	08:06					06:34		19:06 (B0025)			04:12							
	16:21	4 15:40 (B0021)				19:36	1 19:07 (B0025)				21:44							
Potential sun hours	228			262		366			429		515			539				
Total, worst case		4			274		97			488		41						
Sun reduction		0,19			0,16		0,22			0,42		0,53						
Oper. time red.		0,99			0,99		0,99			0,99		0,99						
Wind dir. red.		0,69			0,69		0,65			0,61		0,60						
Total reduction		0,13			0,11		0,15			0,26		0,32						
Total, real		1			31		14			127		13						

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:19>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (844)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:12 (B0018) 18:36	07:10 16:15	15:11 (B0021) 15:21
2	04:04 22:02	04:55 21:16	06:00 19:57	19:13 (B0018) 18:34	07:13 16:13	15:10 (B0021) 15:20
3	04:05 22:01	04:57 21:14	06:02 19:55	19:14 (B0018) 18:31	07:15 16:10	15:08 (B0021) 15:19
4	04:06 22:01	04:59 21:11	06:04 19:52	19:17 (B0018) 18:28	07:17 16:08	15:08 (B0021) 15:18
5	04:07 22:00	05:01 21:09	06:07 19:49	19:21 (B0018) 18:25	07:20 16:06	15:08 (B0021) 15:17
6	04:08 21:59	05:03 21:07	06:09 19:46	19:01 (B0025) 18:23	07:12 16:04	15:08 (B0021) 15:16
7	04:10 21:58	05:05 21:04	06:11 19:44	18:59 (B0025) 18:20	07:14 16:01	15:09 (B0021) 15:15
8	04:11 21:57	05:07 21:02	06:13 19:41	18:57 (B0025) 18:17	07:17 15:59	15:08 (B0021) 15:15
9	04:12 21:56	05:09 21:00	06:15 20:00 (B0017)	19:10 (B0025) 18:14	15:59 15:57	15:22 (B0021) 15:14
10	04:13 21:55	05:11 20:57	06:17 20:08 (B0017)	19:07 (B0025) 18:12	15:57 15:55	15:20 (B0021) 15:14
11	04:15 21:54	05:13 20:55	06:19 20:09 (B0017)	18:56 (B0025) 18:09	07:23 15:53	15:12 (B0021) 15:13
12	04:16 21:53	05:15 20:53	06:21 20:10 (B0017)	18:57 (B0025) 18:06	07:25 15:51	08:33 15:13
13	04:18 21:52	05:18 20:50	06:23 20:10 (B0017)	18:59 (B0025) 18:03	07:28 17:11 (B0020)	08:34 15:13
14	04:19 21:50	05:20 20:48	06:25 20:10 (B0017)	18:03 18:01	8 17:11 (B0020) 17:00 (B0020)	15:49 07:40
15	04:21 21:49	05:22 20:45	06:28 20:10 (B0017)	18:01 18:35 (B0019)	13 17:13 (B0020) 16:59 (B0020)	15:47 07:42
16	04:23 21:47	05:24 20:43	06:30 20:10 (B0017)	17:58 18:27 (B0019)	15 17:14 (B0020) 16:58 (B0020)	15:45 07:45
17	04:24 21:46	05:26 20:40	06:32 20:07 (B0017)	17:55 18:25 (B0019)	16 17:14 (B0020) 16:57 (B0020)	15:43 07:47
18	04:26 21:44	05:28 20:37	06:34 20:05 (B0017)	17:53 18:24 (B0019)	17 17:14 (B0020) 16:58 (B0020)	15:41 07:49
19	04:28 21:43	05:30 20:35	06:36 20:02 (B0017)	07:39 18:38 (B0019)	16 17:14 (B0020) 16:57 (B0020)	15:39 07:51
20	04:29 21:41	05:33 20:32	06:38 20:00 (B0017)	07:41 18:23 (B0019)	16 17:13 (B0020) 16:57 (B0020)	15:38 07:53
21	04:31 21:39	05:35 20:30	06:40 19:22 (B0018)	07:43 18:37 (B0019)	14 17:11 (B0020) 16:59 (B0020)	15:36 07:56
22	04:33 21:38	05:37 20:27	06:42 19:19 (B0018)	07:45 18:34 (B0019)	10 17:09 (B0020) 16:59 (B0020)	15:34 07:58
23	04:35 21:36	05:39 20:24	06:44 19:50 (B0012)	07:48 18:31 (B0019)	7 17:06 (B0020) 17:02 (B0020)	15:33 08:00
24	04:37 21:34	05:41 20:22	06:47 19:15 (B0018)	07:50 18:28 (B0019)	2 17:04 (B0020) 17:04 (B0020)	15:31 08:02
25	04:39 21:32	05:43 20:19	06:49 19:50 (B0012)	07:52 17:35	08:02 15:30	08:04 15:15
26	04:41 21:30	05:45 20:16	06:51 19:14 (B0018)	07:54 16:32	08:04 15:28	08:43 15:16
27	04:42 21:28	05:47 20:14	06:53 19:13 (B0018)	07:57 16:30	08:06 15:27	08:43 15:16
28	04:44 21:26	05:50 20:11	06:55 19:45 (B0012)	07:59 16:27	08:08 15:25	08:43 15:17
29	04:46 21:24	05:52 20:08	06:57 19:12 (B0018)	08:00 16:22	08:10 15:23	15:18 15:19
30	04:48 21:22	05:54 20:06	06:59 19:33 (B0018)	08:04 16:20	15:24 15:22	08:43 15:20
31	04:50 21:20	05:56 20:03	18:39 19:12 (B0018)	08:08 16:17	15:21 (B0021) 8 15:21 (B0021)	08:43 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		414	207	142	141	
Sun reduction		0,35	0,31	0,26	0,17	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,61	0,64	0,69	0,69	
Total reduction		0,22	0,20	0,18	0,12	
Total, real		89	42	25	17	

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)

Project:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÅS 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (818)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:23	06:56 17:29	16:32 (B0020) 16:47 (B0020)	06:31 19:38	05:11 20:44
2	08:43 15:24	08:02 16:26	15:47 (B0021) 15:50 (B0021)	06:54 17:31	19:08 (B0025) 19:11 (B0025)	16 20:06 (B0017)
3	08:42 15:26	08:00 16:28	15:45 (B0021) 15:52 (B0021)	06:51 17:34	19:07 (B0025) 19:13 (B0025)	15 20:06 (B0017)
4	08:42 15:27	07:57 16:30	15:44 (B0021) 15:55 (B0021)	06:48 17:36	19:06 (B0025) 19:16 (B0025)	14 20:04 (B0017)
5	08:41 15:28	07:55 16:33	15:44 (B0021) 15:58 (B0021)	06:46 17:38	19:06 (B0025) 19:17 (B0025)	12 20:03 (B0017)
6	08:41 15:30	07:53 16:35	15:43 (B0021) 16:00 (B0021)	06:43 17:40	19:05 (B0025) 19:18 (B0025)	10 20:03 (B0017)
7	08:40 15:32	07:51 16:37	15:44 (B0021) 16:01 (B0021)	06:40 17:43	19:05 (B0025) 19:17 (B0025)	6 20:01 (B0017)
8	08:39 15:33	07:49 16:40	15:43 (B0021) 16:00 (B0021)	06:37 17:45	19:07 (B0025) 19:17 (B0025)	21:51 21:55
9	08:39 15:35	07:46 16:42	15:44 (B0021) 16:01 (B0021)	06:35 17:47	19:09 (B0025) 19:14 (B0025)	04:02 21:56
10	08:38 15:37	07:44 16:45	15:44 (B0021) 16:00 (B0021)	06:32 17:49	19:06 (B0025) 19:58	04:01 21:57
11	08:37 15:38	07:42 16:47	15:45 (B0021) 16:00 (B0021)	06:29 17:52	19:24 (B0018) 19:30 (B0018)	04:48 21:06
12	08:36 15:40	07:39 16:49	15:46 (B0021) 15:58 (B0021)	06:26 17:54	19:21 (B0018) 19:32 (B0018)	21:06 21:08
13	08:35 15:42	07:37 16:52	15:49 (B0021) 15:57 (B0021)	06:24 17:56	19:19 (B0018) 19:34 (B0018)	04:43 21:10
14	08:33 15:44	07:35 16:54	06:21 17:58	20:04 05:55	19:34 (B0018) 19:18 (B0018)	21:10 04:41
15	08:32 15:46	07:32 16:56	06:18 18:01	20:07 20:09	19:36 (B0018) 19:17 (B0018)	21:12 04:39
16	08:31 15:48	07:30 16:59	06:15 18:03	20:11 05:50	19:16 (B0018) 19:37 (B0018)	04:37 21:16
17	08:30 15:50	07:27 17:01	06:13 18:05	20:13 05:47	19:16 (B0018) 19:42 (B0012)	04:35 21:18
18	08:28 15:52	07:25 17:03	06:10 18:07	20:16 05:42	19:15 (B0018) 19:44 (B0012)	04:33 21:20
19	08:27 15:54	07:22 17:06	06:07 18:10	20:18 05:39	19:16 (B0018) 19:47 (B0012)	04:31 21:22
20	08:25 15:56	07:20 17:08	06:04 18:12	20:20 05:36	19:16 (B0018) 19:48 (B0012)	04:29 21:24
21	08:24 15:58	07:17 17:11	16:37 (B0020) 16:39 (B0020)	06:01 18:14	19:17 (B0018) 19:49 (B0012)	04:27 21:26
22	08:22 16:01	07:15 17:13	16:35 (B0020) 16:42 (B0020)	05:59 18:16	19:17 (B0018) 19:48 (B0012)	04:26 21:28
23	08:21 16:03	07:12 17:15	16:33 (B0020) 16:44 (B0020)	05:56 18:18	19:19 (B0018) 19:47 (B0012)	04:24 21:30
24	08:19 16:05	07:09 17:17	16:32 (B0020) 16:46 (B0020)	05:53 18:21	19:20 (B0018) 19:45 (B0012)	04:22 21:32
25	08:17 16:07	07:07 17:20	16:32 (B0020) 16:48 (B0020)	05:50 18:23	19:24 (B0018) 19:59 (B0017)	04:20 21:34
26	08:15 16:09	07:04 17:22	16:31 (B0020) 16:48 (B0020)	05:47 18:25	19:53 (B0017) 20:01 (B0017)	04:19 21:35
27	08:13 16:12	07:02 17:24	16:31 (B0020) 16:47 (B0020)	05:45 18:27	19:51 (B0017) 20:03 (B0017)	04:17 21:37
28	08:12 16:14	06:59 17:27	16:31 (B0020) 16:47 (B0020)	05:42 18:29	19:51 (B0017) 20:05 (B0017)	04:16 21:39
29	08:10 16:16		06:39 19:32	18:42 (B0019) 18:53 (B0019)	19:50 (B0017) 20:06 (B0017)	04:14 21:41
30	08:08 16:19		06:36 19:34	18:43 (B0019) 18:50 (B0019)	19:50 (B0017) 20:06 (B0017)	04:13 21:42
31	08:06 16:21		06:34 19:36			04:12 21:44
Potential sun hours	228	262	366	429	515	539
Total, worst case		253	127	451	73	
Sun reduction		0,16	0,22	0,42	0,53	
Oper. time red.		0,99	0,99	0,99	0,99	
Wind dir. red.		0,69	0,66	0,61	0,60	
Total reduction		0,11	0,15	0,26	0,32	
Total, real		28	19	118	23	

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: VÄSTRA EKÄS 1:7>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (818)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

	July	August	September	October	November	December
1	04:03 22:03	04:52 21:18	05:58 20:00	19:23 (B0018) 19:29 (B0018)	07:01 18:36	07:10 16:15
2	04:04 22:02	04:55 21:16	06:00 19:57	19:07 (B0025) 19:12 (B0025)	07:06 18:31	15:14 (B0021) 15:30 (B0021)
3	04:05 22:01	04:57 21:14	06:02 19:55	19:07 (B0025) 19:12 (B0025)	07:06 18:31	15:14 (B0021) 15:30 (B0021)
4	04:06 22:01	04:59 21:11	06:04 19:52	19:04 (B0025) 19:14 (B0025)	07:08 18:28	15:13 (B0021) 15:30 (B0021)
5	04:07 22:00	05:01 21:09	06:07 19:49	19:02 (B0025) 19:14 (B0025)	07:10 18:25	15:13 (B0021) 15:29 (B0021)
6	04:08 21:59	05:03 21:07	06:09 19:46	19:01 (B0025) 19:14 (B0025)	07:12 18:23	15:14 (B0021) 15:27 (B0021)
7	04:10 21:58	05:05 21:04	06:11 19:44	19:01 (B0025) 19:13 (B0025)	07:14 18:20	15:15 (B0021) 15:25 (B0021)
8	04:11 21:57	05:07 21:02	06:13 19:41	19:01 (B0025) 19:10 (B0025)	07:17 18:17	15:16 (B0021) 15:22 (B0021)
9	04:12 21:56	05:09 21:00	06:15 19:38	19:01 (B0025) 19:07 (B0025)	07:19 18:14	15:18 (B0021) 15:20 (B0021)
10	04:13 21:55	05:11 20:57	06:17 19:35	19:01 (B0025) 19:04 (B0025)	07:21 18:12	15:20 (B0021) 15:55
11	04:15 21:54	05:13 20:55	06:19 19:32	19:04 (B0025) 18:09	18:12 17:07	15:55 15:33
12	04:16 21:53	05:15 20:52	06:21 19:30	18:09 17:25	17:07 (B0020) 17:06 (B0020)	15:33 15:36
13	04:18 21:52	05:18 20:50	06:23 19:27	18:06 18:35 (B0019)	17:20 (B0020) 17:05 (B0020)	15:31 15:38
14	04:19 21:50	05:20 20:48	06:25 19:24	18:35 (B0019) 18:41 (B0019)	17:05 (B0020) 17:04 (B0020)	15:38 15:49
15	04:21 21:49	05:22 20:45	06:28 19:21	18:32 (B0019) 18:43 (B0019)	17:04 (B0020) 17:20 (B0020)	15:40 15:47
16	04:23 21:47	05:24 20:43	06:30 19:18	18:31 (B0019) 18:44 (B0019)	17:42 (B0020) 17:03 (B0020)	15:42 15:45
17	04:24 21:46	05:26 20:40	06:32 19:16	18:29 (B0019) 18:44 (B0019)	17:45 (B0020) 17:03 (B0020)	15:47 15:41
18	04:26 21:44	05:28 20:37	06:34 19:13	18:28 (B0019) 18:41 (B0019)	17:49 (B0020) 17:17 (B0020)	15:49 15:39
19	04:28 21:43	05:30 20:35	06:36 19:10	18:28 (B0019) 18:39 (B0019)	17:51 (B0020) 17:14 (B0020)	15:51 15:38
20	04:29 21:41	05:33 20:32	06:38 19:07	18:29 (B0019) 18:37 (B0019)	17:53 (B0020) 17:45	15:40 15:36
21	04:31 21:39	05:35 20:30	06:40 19:04	18:30 (B0019) 18:34 (B0019)	17:45 17:42	15:36 15:34
22	04:33 21:38	05:37 20:27	06:42 19:02	17:42 17:40	17:42 17:40	15:34 15:33
23	04:35 21:36	05:39 20:24	06:44 18:59	17:40 17:37	17:40 17:37	15:33 15:31
24	04:37 21:34	05:41 20:22	06:47 18:56	17:37 17:35	17:37 17:35	15:31 15:30
25	04:39 21:32	05:43 20:19	06:49 18:53	17:35 16:32	17:35 15:28	15:30 15:16
26	04:41 21:30	05:45 20:16	06:51 18:50	16:32 16:30	15:28 15:27	15:16 15:16
27	04:42 21:28	05:47 20:14	06:53 18:48	16:30 16:27	15:27 15:25	15:16 15:17
28	04:44 21:26	05:50 20:11	06:55 18:45	16:27 16:25	15:25 15:23	15:17 15:24
29	04:46 21:24	05:52 20:08	06:57 18:42	16:25 16:22	15:23 (B0021) 15:27 (B0021)	15:24 15:23
30	04:48 21:22	05:54 20:06	06:59 18:39	16:22 16:20	15:23 (B0021) 15:28 (B0021)	15:24 15:22
31	04:50 21:20	05:56 20:03	19:21 (B0018) 19:32 (B0018)	16:20 16:17	15:28 (B0021) 15:15 (B0021)	15:20 15:21
Potential sun hours	538	474	386	321	241	207
Total, worst case		452	172	174	113	156
Sun reduction		0,35	0,31	0,26	0,17	0,13
Oper. time red.		0,99	0,99	0,99	0,99	0,99
Wind dir. red.		0,60	0,64	0,69	0,69	0,69
Total reduction		0,22	0,20	0,18	0,12	0,09
Total, real		97	35	31	14	14

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:

bruzaholm

Licensed user:

VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com

Calculated:

2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:11>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (880)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:06 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:28	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:10 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:53 16:36	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53	04:09 21:59	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:25 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55	04:11 21:58	05:08 21:02	06:13 19:41	07:17 18:17	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:56	05:12 20:58	06:18 19:36	07:21 18:12	07:31 15:56	08:30 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:44	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:45	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:38 21:17	03:59 22:02	04:23 21:48	05:24 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:37 15:13
17	08:30 15:50	07:28 17:02	06:13 18:06	05:47 20:14	04:35 21:19	03:59 22:03	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:29 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:21	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:23	03:59 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:25	03:59 22:04	04:30 21:41	05:33 20:33	06:39 19:08	07:43 17:45	07:54 15:36	08:41 15:14
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:26	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:23 16:01	07:15 17:13	05:59 18:17	05:34 20:25	04:26 21:28	03:59 22:04	04:33 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:42 15:15
24	08:19 16:05	07:10 17:18	05:54 18:21	05:29 20:29	04:23 21:32	04:00 22:05	04:37 21:34	05:42 20:22	06:47 18:56	07:53 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:33	05:44 20:19	06:49 18:54	06:55 16:33	08:04 15:29	08:43 15:16
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:34	04:19 21:36	04:01 22:04	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:43 15:17
27	08:14 16:12	07:02 17:25	05:45 18:28	05:21 20:36	04:18 21:37	04:01 22:04	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:44 15:18
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:27	05:50 20:11	06:55 18:45	07:02 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17		06:40 19:32	05:16 20:40	04:15 21:41	04:02 22:04	04:47 21:25	05:52 20:09	06:58 18:42	07:04 16:23	08:12 15:23	08:44 15:20
30	08:08 16:19		06:37 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21		06:34 19:36		04:12 21:44		04:51 21:20	05:56 20:03		07:09 16:18		08:44 15:22
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
Total, worst case				65				65				
Sun reduction				0,42				0,35				
Oper. time red.				0,99				0,99				
Wind dir. red.				0,66				0,66				
Total reduction				0,28				0,23				
Total, real				18				15				

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:14>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (907)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:29	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:11 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:54 16:36	06:43 17:41	06:17 19:50	04:59 20:56	04:05 21:53	04:09 22:00	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:25 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:58	05:08 21:03	06:13 19:41	07:17 18:17	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:56	05:12 20:58	06:18 19:36	07:21 18:12	07:32 15:56	08:31 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:45	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:13	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:46	08:37 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:12	04:38 21:17	03:59 22:02	04:23 21:48	05:24 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:38 15:13
17	08:30 15:50	07:28 17:02	06:13 18:06	05:47 20:14	04:36 21:19	03:59 22:03	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:29 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:21	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:23	03:59 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:25	03:59 22:04	04:30 21:41	05:33 20:33	06:39 19:08	07:44 17:45	07:54 15:37	08:41 15:14
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:27	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:23 16:01	07:15 17:13	05:59 18:17	05:34 20:25	04:26 21:28	03:59 22:04	04:34 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:12 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:43 15:15
24	08:19 16:05	07:10 17:18	05:54 18:21	05:29 20:29	04:23 21:32	04:00 22:05	04:37 21:34	05:42 20:22	06:47 18:56	07:53 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:33	05:44 20:20	06:49 18:54	06:55 16:33	08:04 15:29	08:43 15:16
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:34	04:19 21:36	04:01 22:05	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:44 15:17
27	08:14 16:12	07:02 17:25	05:45 18:28	05:21 20:36	04:18 21:38	04:01 22:04	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:44 15:18
28	08:12 16:15	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:27	05:50 20:11	06:56 18:45	07:02 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17		06:40 19:32	05:16 20:40	04:15 21:41	04:02 22:04	04:47 21:25	05:52 20:09	06:58 18:42	07:04 16:23	08:12 15:23	08:44 15:20
30	08:08 16:19		06:37 19:34	05:14 20:42	04:13 21:43	04:03 22:03	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21		06:34 19:36		04:12 21:44		04:51 21:20	05:56 20:03		07:09 16:18		08:44 15:22
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
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)

Project:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:15>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (883)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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

	January	February	March	April	May	June
1	08:43 15:23	08:04 16:24	06:57 17:29	06:31 19:38	05:11 20:44	06:18 (B0005) 21:46 18 05:20 (B0009)
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	06:20 (B0005) 21:47 17 05:19 (B0009)
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:06 20:49	06:29 (B0005) 21:48 18 05:19 (B0004)
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50 18 05:19 (B0004)
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51 18 05:19 (B0004)
6	08:41 15:30	07:53 16:35	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53 20 05:21 (B0004)
7	08:40 15:32	07:51 16:38	06:41 17:43	06:14 19:52	04:57 20:58	04:04 21:54 20 05:21 (B0004)
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:03 21:55 20 05:21 (B0004)
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:52 21:02	04:03 21:56 21 05:22 (B0004)
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57 20 05:21 (B0004)
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58 21 05:22 (B0004)
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59 21 05:22 (B0004)
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00 21 05:22 (B0004)
14	08:34 15:44	07:35 16:54	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:01 21 05:23 (B0004)
15	08:32 15:46	07:32 16:57	06:19 18:01	05:53 20:09	04:39 21:14	03:59 22:01 21 05:23 (B0004)
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:11	04:37 21:17	05:13 (B0009) 22:02 22 05:24 (B0004)
17	08:30 15:50	07:28 17:02	06:13 18:05	05:47 20:14	04:35 21:19	05:11 (B0009) 22:03 21 05:23 (B0004)
18	08:28 15:52	07:25 17:04	06:10 18:08	05:45 20:16	04:33 21:21	05:09 (B0009) 22:03 21 05:23 (B0004)
19	08:27 15:55	07:23 17:06	06:07 18:10	05:42 20:18	04:32 21:23	05:09 (B0009) 22:03 21 05:24 (B0004)
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:24	05:08 (B0009) 22:04 22 05:25 (B0004)
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:22	04:28 21:26	05:07 (B0009) 22:04 22 05:25 (B0004)
22	08:22 16:01	07:15 17:13	05:59 18:16	05:34 20:25	04:26 21:28	05:07 (B0009) 22:04 22 05:25 (B0004)
23	08:21 16:03	07:12 17:16	05:56 18:19	05:31 20:27	04:24 21:30	05:07 (B0009) 22:04 21 05:24 (B0004)
24	08:19 16:05	07:10 17:18	05:53 18:21	05:29 20:29	04:23 21:32	05:07 (B0009) 22:05 21 05:25 (B0004)
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	05:07 (B0009) 22:04 21 05:25 (B0004)
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:33	04:19 21:36	05:07 (B0009) 22:04 22 05:26 (B0004)
27	08:14 16:12	07:02 17:25	05:45 18:27	05:21 20:36	04:18 21:37	05:08 (B0009) 22:04 21 05:25 (B0004)
28	08:12 16:14	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	05:06 (B0004) 22:04 21 05:26 (B0004)
29	08:10 16:17	06:39 19:32	05:16 20:40	05:16 20:40	04:15 21:41	05:04 (B0004) 22:04 22 05:26 (B0004)
30	08:08 16:19	06:37 19:34	05:14 20:42	05:14 20:42	04:13 21:42	05:03 (B0004) 22:03 21 05:26 (B0004)
31	08:06 16:21	06:34 19:36			04:12 21:44	05:03 (B0004) 22:03 17 05:20 (B0009)
Potential sun hours	228	263	366	429	515	539
Total, worst case				357	236	616
Sun reduction				0,42	0,53	0,43
Oper. time red.				0,99	0,99	0,99
Wind dir. red.				0,66	0,69	0,69
Total reduction				0,28	0,36	0,29
Total, real				99	85	180

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:
bruzaholm

Licensed user:
VATTENFALL AB IT
Företagsenhet 1002
SE-962 80 Jokkmokk

Helena Wickman / helena.wickman@vattenfall.com
Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:15>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (883)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
Idle start wind speed: Cut in wind speed from power curve

July		August		September	October	November	December
1	04:04	05:06 (B0004)	04:53	05:58	07:02	07:11	08:16
	22:03	20 05:26 (B0004)	21:18	20:00	18:37	16:16	15:21
2	04:05	05:06 (B0004)	04:55	06:01	07:04	07:13	08:18
	22:02	21 05:27 (B0004)	21:16	19:58	18:34	16:13	15:20
3	04:06	05:06 (B0004)	04:57	06:03	07:06	07:15	08:19
	22:02	21 05:27 (B0004)	21:14	19:55	18:31	16:11	15:19
4	04:07	05:07 (B0004)	04:59	06:05	07:08	07:18	08:21
	22:01	20 05:27 (B0004)	21:12	19:52	18:28	16:09	15:18
5	04:08	05:06 (B0004)	05:01	06:07	07:10	07:20	08:23
	22:00	20 05:26 (B0004)	21:09	19:49	18:26	16:06	15:17
6	04:09	05:08 (B0004)	05:03	06:09	07:13	07:22	08:24
	21:59	19 05:27 (B0004)	21:07	19:47	18:23	16:04	15:17
7	04:10	05:08 (B0004)	05:05	06:11	07:15	07:25	08:26
	21:59	19 05:27 (B0004)	21:05	19:44	18:20	16:02	15:16
8	04:11	05:08 (B0004)	05:07	06:13	07:17	07:27	08:28
	21:58	19 05:27 (B0004)	21:02	19:41	18:17	16:00	15:15
9	04:13	05:09 (B0004)	05:10	06:15	07:19	07:29	08:29
	21:57	17 05:26 (B0004)	21:00	19:38	18:15	15:58	15:15
10	04:14	05:09 (B0004)	05:12	06:17	07:21	07:31	08:30
	21:55	17 05:26 (B0004)	20:58	19:36	18:12	15:55	15:14
11	04:15	05:09 (B0004)	05:14	06:20	07:23	07:34	08:32
	21:54	18 05:27 (B0009)	20:55	19:33	18:09	15:53	15:14
12	04:17	05:11 (B0004)	05:16	06:15 (B0010)	06:22	07:26	07:36
	21:53	18 05:29 (B0009)	20:53	19:30	18:07	15:51	15:13
13	04:18	05:11 (B0004)	05:18	06:12 (B0010)	06:24	07:28	07:38
	21:52	18 05:29 (B0009)	20:50	19:27	18:04	15:49	15:13
14	04:20	05:12 (B0004)	05:20	06:11 (B0010)	06:26	07:30	07:40
	21:50	17 05:29 (B0009)	20:48	19:24	18:01	15:47	15:13
15	04:21	05:14 (B0004)	05:22	06:10 (B0010)	06:28	07:32	07:43
	21:49	17 05:31 (B0009)	20:45	19:22	17:58	15:45	15:13
16	04:23	05:16 (B0004)	05:24	06:09 (B0010)	06:30	07:34	07:45
	21:48	15 05:31 (B0009)	20:43	19:19	17:56	15:44	15:13
17	04:25	05:17 (B0009)	05:27	06:09 (B0010)	06:32	07:37	07:47
	21:46	14 05:31 (B0009)	20:40	19:16	17:53	15:42	15:13
18	04:26	05:17 (B0009)	05:29	06:08 (B0010)	06:34	07:39	07:49
	21:45	14 05:31 (B0009)	20:38	19:13	17:51	15:40	15:13
19	04:28	05:17 (B0009)	05:31	06:09 (B0010)	06:36	07:41	07:52
	21:43	15 05:32 (B0009)	20:35	19:10	17:48	15:38	15:13
20	04:30	05:17 (B0009)	05:33	06:09 (B0010)	06:38	07:43	07:54
	21:41	14 05:31 (B0009)	20:33	19:08	17:45	15:36	15:14
21	04:32	05:17 (B0009)	05:35	06:10 (B0010)	06:41	07:46	07:56
	21:40	15 05:32 (B0009)	20:30	19:05	17:43	15:35	15:14
22	04:33	05:18 (B0009)	05:37	06:11 (B0010)	06:43	07:48	07:58
	21:38	14 05:32 (B0009)	20:27	19:02	17:40	15:33	15:14
23	04:35	05:17 (B0009)	05:39	06:23 (B0005)	06:45	07:50	08:00
	21:36	14 05:31 (B0009)	20:25	18:59	17:38	15:32	15:15
24	04:37	05:18 (B0009)	05:41	06:24 (B0005)	06:47	07:52	08:02
	21:34	13 05:31 (B0009)	20:22	18:56	17:35	15:30	15:15
25	04:39	05:19 (B0009)	05:44	06:26 (B0005)	06:49	06:55	08:04
	21:32	12 05:31 (B0009)	20:19	18:53	16:33	15:29	15:16
26	04:41	05:20 (B0009)	05:46	06:51	06:57	08:06	08:43
	21:31	9 05:29 (B0009)	20:17	18:51	16:30	15:27	15:17
27	04:43	05:22 (B0009)	05:48	06:53	06:59	08:08	08:44
	21:29	6 05:28 (B0009)	20:14	18:48	16:28	15:26	15:18
28	04:45		05:50	06:55	07:02	08:10	08:44
	21:27		20:11	18:45	16:25	15:25	15:19
29	04:47		05:52	06:58	07:04	08:12	08:44
	21:25		20:09	18:42	16:23	15:23	15:20
30	04:49		05:54	07:00	07:06	08:14	08:44
	21:22		20:06	18:40	16:20	15:22	15:21
31	04:51		05:56		07:08		08:44
	21:20		20:03		16:18		15:22
Potential sun hours	538		474	386	321	241	207
Total, worst case		436					
Sun reduction		0,38					
Oper. time red.		0,99					
Wind dir. red.		0,69					
Total reduction		0,26					
Total, real		114					

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)

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:16>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (877)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:29	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:27	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:29	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:11 18:26	07:20 16:06	08:23 15:17
6	08:41 15:30	07:54 16:36	06:43 17:41	06:17 19:50	04:59 20:56	04:05 21:53	04:09 22:00	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:25 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:58	05:08 21:03	06:13 19:41	07:17 18:18	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:56	05:12 20:58	06:18 19:36	07:21 18:12	07:32 15:56	08:31 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:01	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:13
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:45	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:13	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:21 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:46	08:37 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:12	04:38 21:17	03:59 22:02	04:23 21:48	05:25 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:38 15:13
17	08:30 15:50	07:28 17:02	06:13 18:06	05:47 20:14	04:36 21:19	03:59 22:03	04:25 21:46	05:27 20:40	06:32 19:16	07:37 17:53	07:47 15:42	08:38 15:13
18	08:29 15:53	07:25 17:04	06:10 18:08	05:45 20:16	04:34 21:21	03:59 22:03	04:26 21:45	05:29 20:38	06:34 19:13	07:39 17:51	07:49 15:40	08:39 15:13
19	08:27 15:55	07:23 17:06	06:08 18:10	05:42 20:18	04:32 21:23	03:59 22:04	04:28 21:43	05:31 20:35	06:36 19:10	07:41 17:48	07:52 15:38	08:40 15:13
20	08:26 15:57	07:20 17:09	06:05 18:12	05:39 20:20	04:30 21:25	03:59 22:04	04:30 21:42	05:33 20:33	06:39 19:08	07:44 17:45	07:54 15:37	08:41 15:14
21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:27	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
22	08:23 16:01	07:15 17:13	05:59 18:17	05:34 20:25	04:26 21:28	03:59 22:04	04:34 21:38	05:37 20:27	06:43 19:02	07:48 17:40	07:58 15:33	08:42 15:14
23	08:21 16:03	07:13 17:16	05:56 18:19	05:32 20:27	04:24 21:30	03:59 22:05	04:35 21:36	05:39 20:25	06:45 18:59	07:50 17:38	08:00 15:32	08:43 15:15
24	08:19 16:05	07:10 17:18	05:54 18:21	05:29 20:29	04:23 21:32	04:00 22:05	04:37 21:34	05:42 20:22	06:47 18:56	07:53 17:35	08:02 15:30	08:43 15:16
25	08:17 16:08	07:07 17:20	05:51 18:23	05:26 20:31	04:21 21:34	04:00 22:05	04:39 21:33	05:44 20:20	06:49 18:54	06:55 16:33	08:04 15:29	08:43 15:16
26	08:16 16:10	07:05 17:23	05:48 18:25	05:24 20:34	04:19 21:36	04:01 22:05	04:41 21:31	05:46 20:17	06:51 18:51	06:57 16:30	08:06 15:27	08:44 15:17
27	08:14 16:12	07:02 17:25	05:45 18:28	05:21 20:36	04:18 21:38	04:01 22:04	04:43 21:29	05:48 20:14	06:53 18:48	06:59 16:28	08:08 15:26	08:44 15:18
28	08:12 16:15	06:59 17:27	05:42 18:30	05:19 20:38	04:16 21:39	04:02 22:04	04:45 21:27	05:50 20:11	06:56 18:45	07:02 16:25	08:10 15:25	08:44 15:19
29	08:10 16:17	06:40 19:32	05:16 20:40	04:15 21:41	04:02 22:04	04:02 21:25	04:47 21:09	05:52 20:09	06:58 18:42	07:04 16:23	08:12 15:23	08:44 15:20
30	08:08 16:19	06:37 19:34	05:14 20:42	04:13 21:43	04:03 22:03	04:03 21:23	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21	06:34 19:36	05:12 20:44	04:11 21:44	04:01 22:04	04:01 21:20	04:51 20:03	05:56 20:03	07:09 16:18	07:09 15:22	08:14 15:22	08:44 15:22
Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:17>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (896)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:24	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:29	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
4	08:42 15:28	07:58 16:31	06:49 17:36	06:23 19:45	05:04 20:51	04:07 21:50	04:07 22:01	04:59 21:12	06:05 19:52	07:08 18:29	07:18 16:09	08:21 15:18
5	08:42 15:29	07:56 16:33	06:46 17:39	06:20 19:47	05:02 20:53	04:06 21:51	04:08 22:00	05:01 21:09	06:07 19:50	07:11 18:26	07:20 16:06	08:23 15:17
6	08:41 15:31	07:54 16:36	06:43 17:41	06:17 19:49	04:59 20:55	04:05 21:53	04:09 21:59	05:03 21:07	06:09 19:47	07:13 18:23	07:22 16:04	08:25 15:17
7	08:40 15:32	07:51 16:38	06:41 17:43	06:15 19:52	04:57 20:58	04:04 21:54	04:10 21:59	05:05 21:05	06:11 19:44	07:15 18:20	07:25 16:02	08:26 15:16
8	08:40 15:34	07:49 16:40	06:38 17:45	06:12 19:54	04:55 21:00	04:04 21:55	04:11 21:58	05:08 21:02	06:13 19:41	07:17 18:18	07:27 16:00	08:28 15:15
9	08:39 15:35	07:47 16:43	06:35 17:48	06:09 19:56	04:53 21:02	04:03 21:56	04:13 21:57	05:10 21:00	06:15 19:38	07:19 18:15	07:29 15:58	08:29 15:15
10	08:38 15:37	07:44 16:45	06:32 17:50	06:06 19:58	04:50 21:04	04:02 21:57	04:14 21:56	05:12 20:58	06:18 19:36	07:21 18:12	07:31 15:56	08:30 15:14
11	08:37 15:39	07:42 16:47	06:30 17:52	06:04 20:00	04:48 21:06	04:01 21:58	04:15 21:54	05:14 20:55	06:20 19:33	07:24 18:09	07:34 15:53	08:32 15:14
12	08:36 15:41	07:40 16:50	06:27 17:54	06:01 20:03	04:46 21:08	04:01 21:59	04:17 21:53	05:16 20:53	06:22 19:30	07:26 18:07	07:36 15:51	08:33 15:14
13	08:35 15:43	07:37 16:52	06:24 17:57	05:58 20:05	04:44 21:10	04:00 22:00	04:18 21:52	05:18 20:50	06:24 19:27	07:28 18:04	07:38 15:49	08:34 15:13
14	08:34 15:45	07:35 16:55	06:21 17:59	05:55 20:07	04:42 21:12	04:00 22:01	04:20 21:51	05:20 20:48	06:26 19:24	07:30 18:01	07:41 15:47	08:35 15:13
15	08:33 15:46	07:33 16:57	06:19 18:01	05:53 20:09	04:40 21:15	04:00 22:01	04:22 21:49	05:22 20:45	06:28 19:22	07:32 17:59	07:43 15:46	08:36 15:13
16	08:31 15:48	07:30 16:59	06:16 18:03	05:50 20:12	04:38 21:17	03:59 22:02	04:23 21:48	05:25 20:43	06:30 19:19	07:35 17:56	07:45 15:44	08:37 15:13
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21	08:24 15:59	07:18 17:11	06:02 18:14	05:37 20:23	04:28 21:27	03:59 22:04	04:32 21:40	05:35 20:30	06:41 19:05	07:46 17:43	07:56 15:35	08:41 15:14
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31	08:06 16:21	06:34 19:36	05:12 20:44	04:11 21:44	04:01 22:04	04:01 21:20	04:51 20:03	05:56 20:03	07:09 16:18	07:09 15:22	08:14 15:22	08:44 15:22
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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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:18>1 - Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (908)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,36	1,52	2,62	6,08	8,82	7,64	6,65	5,42	4,02	2,68	1,38	0,88

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
607	444	527	477	508	547	614	1 094	1 457	1 175	579	622	8 652

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

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:2>2 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (809)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
2	08:43 15:25	08:02 16:26	06:54 17:32	06:28 19:41	05:09 20:47	04:10 21:47	04:05 22:02	04:55 21:16	06:01 19:58	07:04 18:34	07:13 16:13	08:18 15:20
3	08:43 15:26	08:00 16:28	06:51 17:34	06:26 19:43	05:07 20:49	04:08 21:49	04:06 22:02	04:57 21:14	06:03 19:55	07:06 18:31	07:15 16:11	08:20 15:19
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Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:2>2 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (849)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652
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 15:23	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
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Potential sun hours	228	263	366	429	515	539	538	474	386	321	241	207
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		

SHADOW - Calendar

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5mShadow receptor: ÅGERSGÖL 1:6>1 - Shadow Receptor: 5,0 x 5,0 Azimuth: 0,0° Slope: 0,0° (861)
Sunshine probability S (Average daily sunshine hours) [VAXJO /KRONOBER G]

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,36 1,52 2,62 6,08 8,82 7,64 6,65 5,42 4,02 2,68 1,38 0,88

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
607 444 527 477 508 547 614 1 094 1 457 1 175 579 622 8 652

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 15:23	08:04 16:24	06:57 17:30	06:31 19:39	05:11 20:45	04:11 21:46	04:04 22:03	04:53 21:18	05:59 20:01	07:02 18:37	07:11 16:16	08:16 15:21
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30	08:08 16:19		06:37 19:34	05:14 20:42	04:13 21:42	04:03 22:03	04:49 21:23	05:54 20:06	07:00 18:40	07:06 16:20	08:14 15:22	08:44 15:21
31	08:06 16:21		06:34 19:36		04:12 21:44		04:51 21:20	05:56 20:03		07:09 16:18		08:44 15:22
Potential sun hours	228	263	366	429	515	538	538	474	386	321	241	207
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

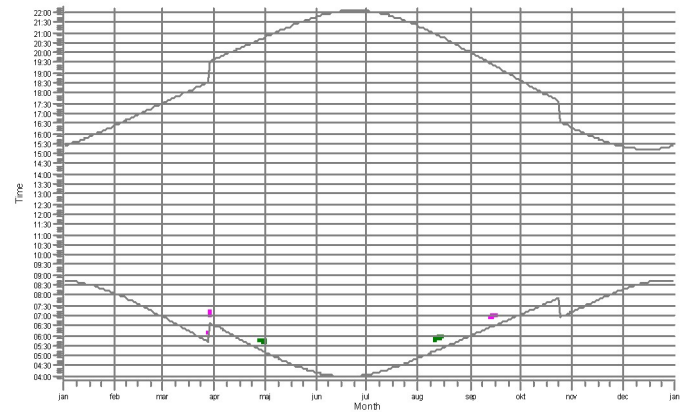
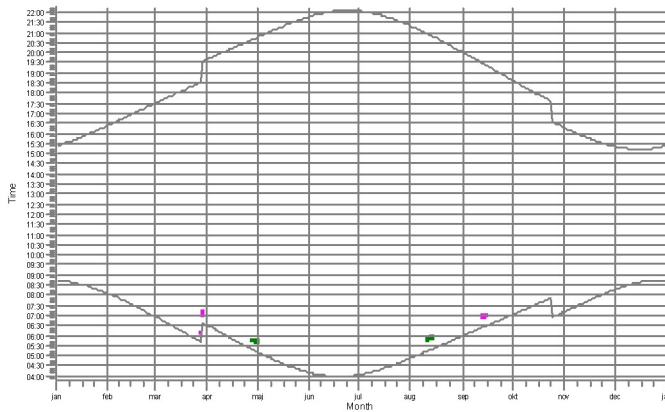
Table layout: For each day in each month the following matrix apply

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)

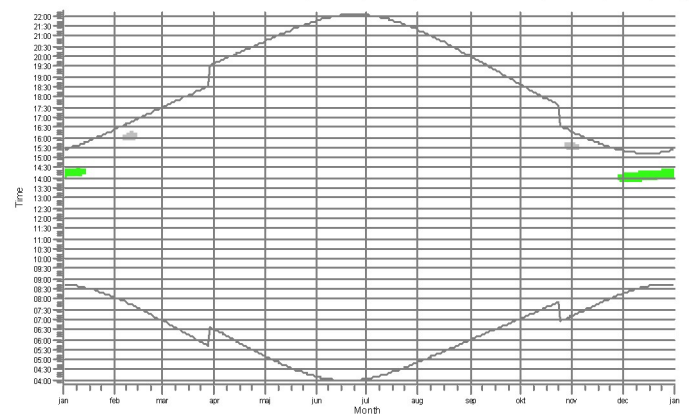
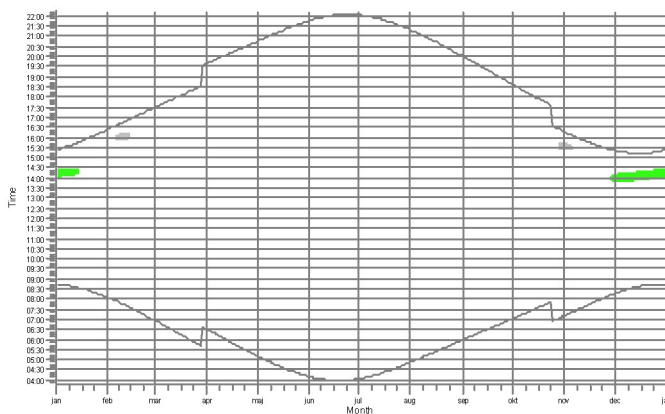
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

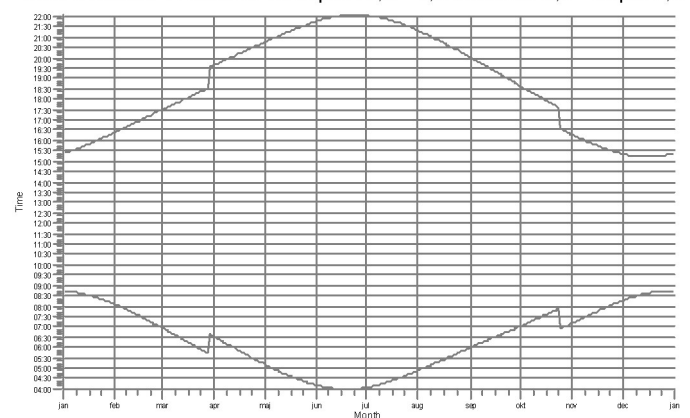
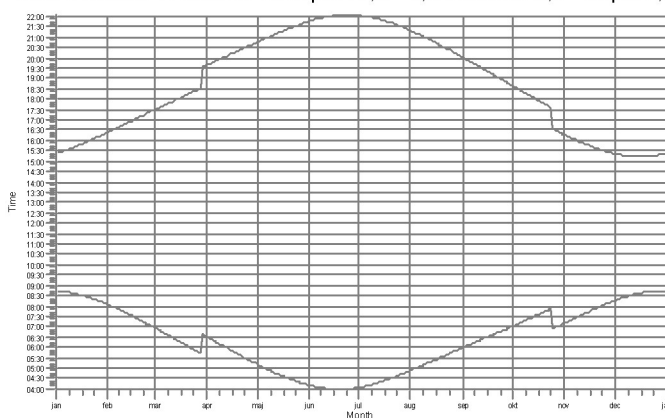
ARKARP 1:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (ARKARP 1:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



ARKARP 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (ARKARP 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



BOGARD 6:29>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° BOGARD 6:30>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



WTGs

1: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (283)
5: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (287)

B0006: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (919)
B0012: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (925)

Project:
bruzaholm

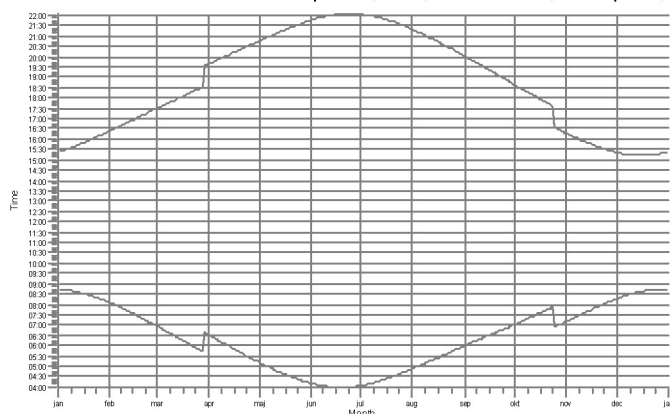
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SE-962 80 Jokkmokk

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Calculated:
2017-09-08 18:49/3.1.617

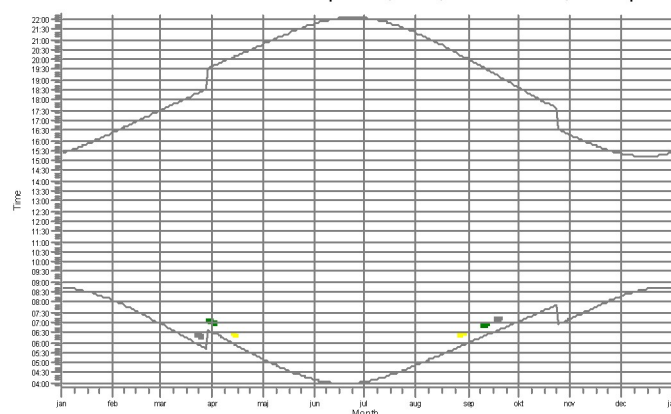
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

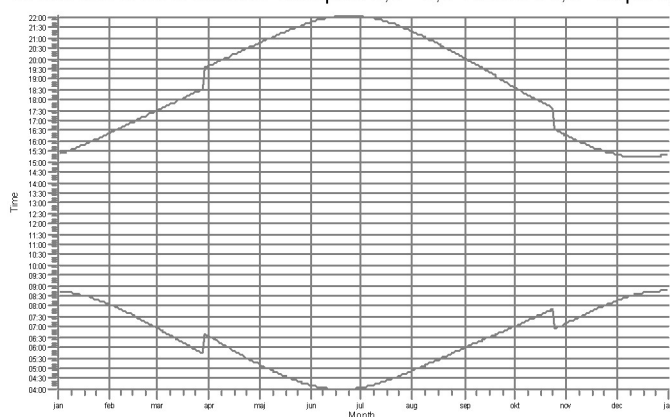
BOGARD 6:32>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



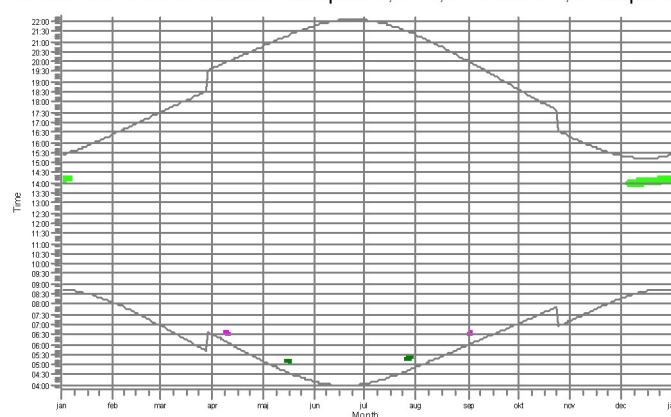
BROKABO 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



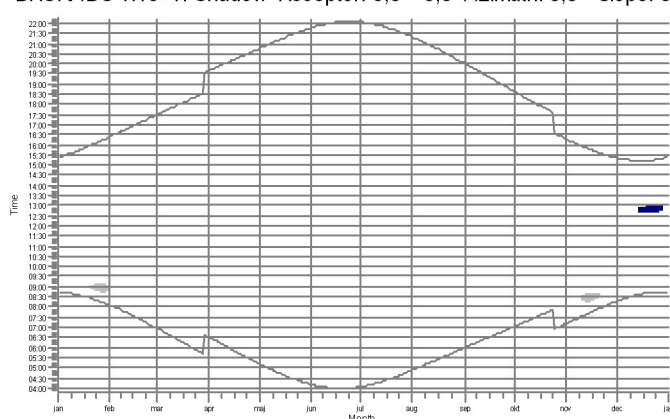
BROKABO 1:12>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



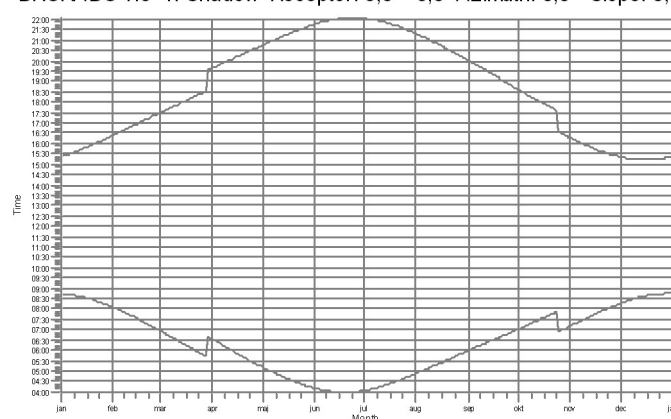
BROKABO 1:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



BROKABO 1:19>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



BROKABO 1:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



WTGs

1: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (283)
2: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (284)
4: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (286)

5: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (287)
B0001: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (914)
B0006: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (919)

B0012: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (925)

Project:
bruzaholm

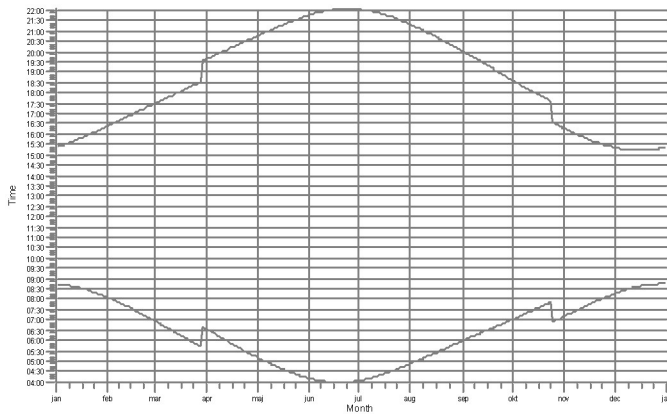
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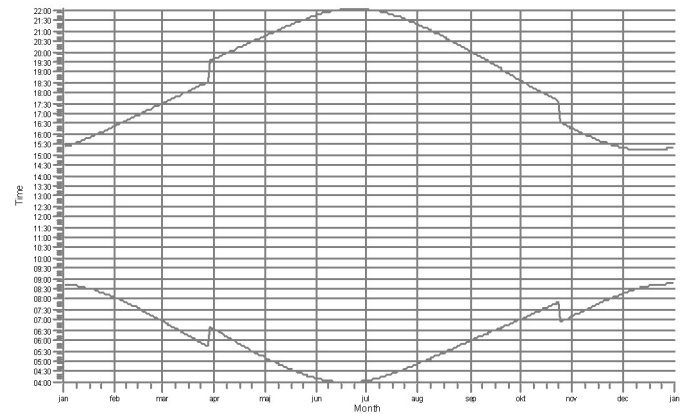
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

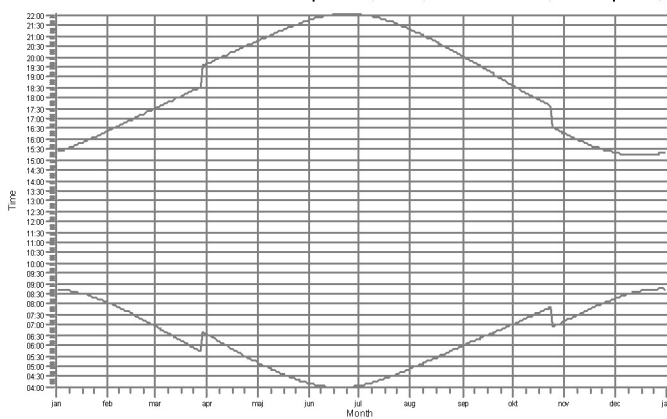
BROKABO 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



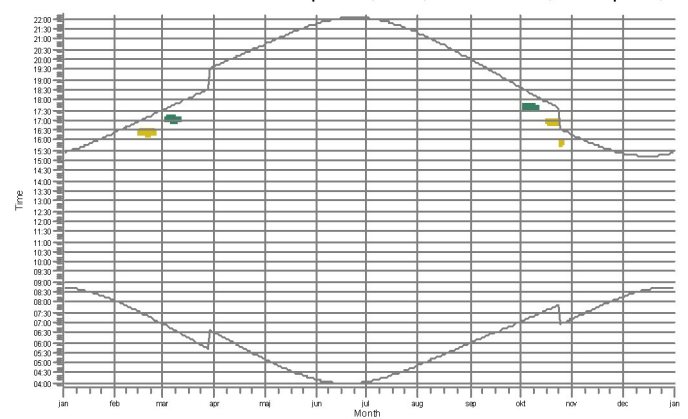
BROKABO 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



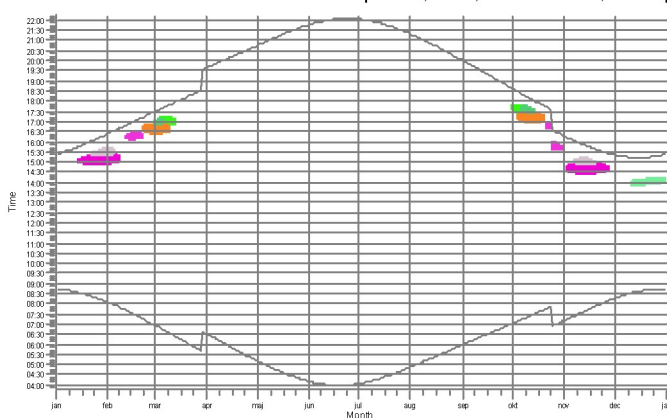
BROKABO 1:8>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



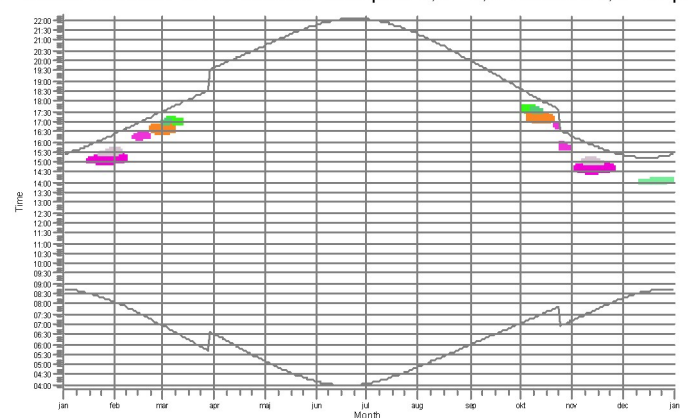
DÄNHULT 1:2>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



DÖDRINGSHULT 1:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



DÖDRINGSHULT 1:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



WTGs

B0012: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (925)
B0017: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (930)
B0018: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (931)

B0019: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (932)
B0020: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (933)
B0022: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (935)

B0023: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (936)
B0024: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (937)
B0025: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (938)

Project:
bruzaholm

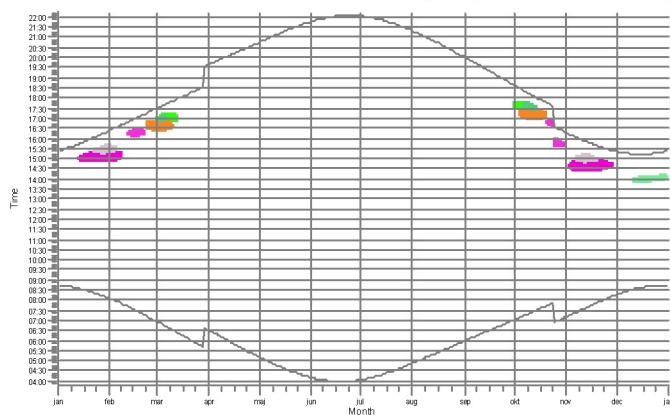
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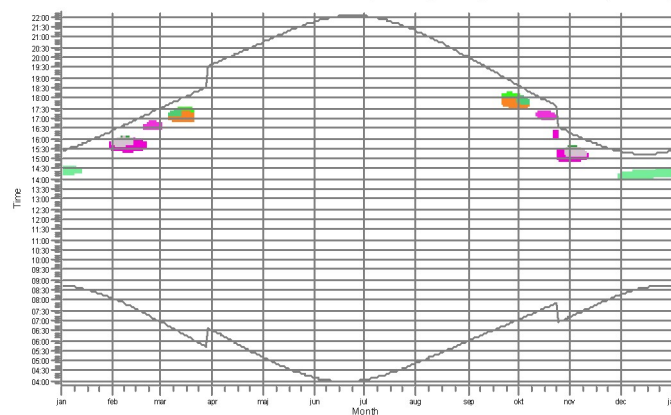
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

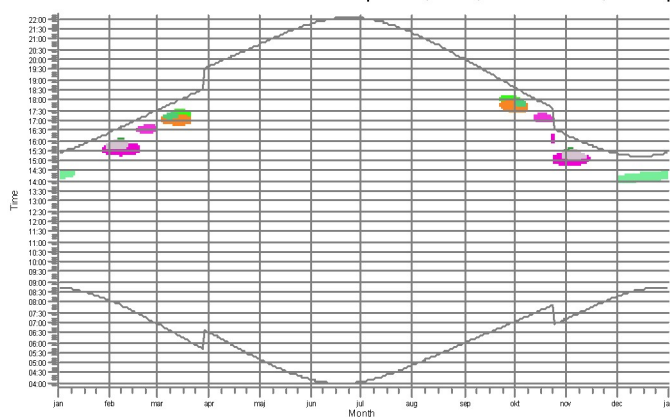
DÖDRINGSHULT 1:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



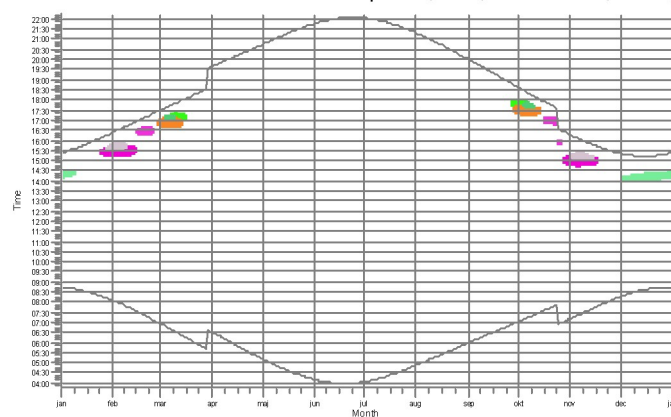
DÖDRINGSHULT 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



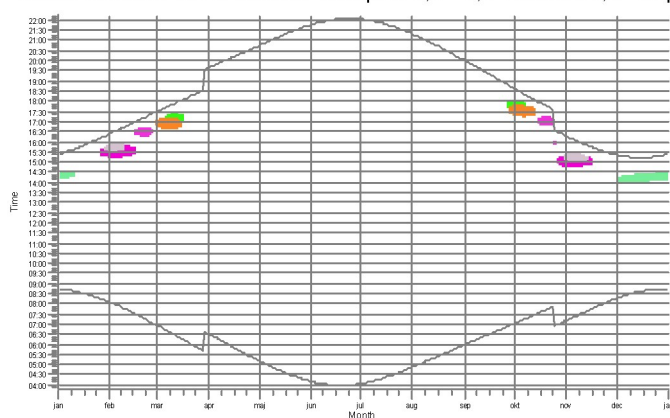
DÖDRINGSHULT 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



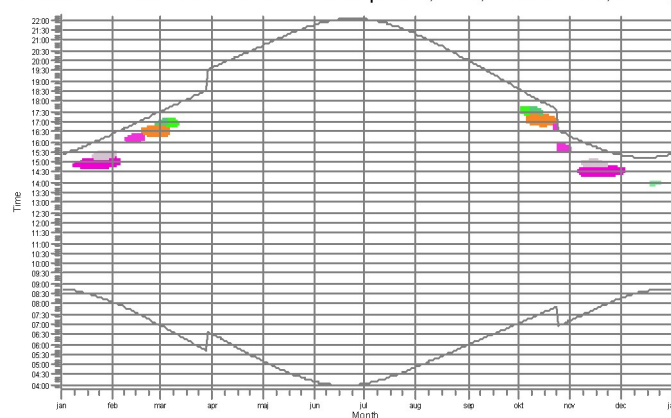
DÖDRINGSHULT 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



DÖDRINGSHULT 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



DÖDRINGSHULT 1:8>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



WTGs

B0012: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (925)
B0014: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (927)
B0017: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (930)

B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)
B0019: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (932)
B0020: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (933)

B0022: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (935)
B0025: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (938)

Project:
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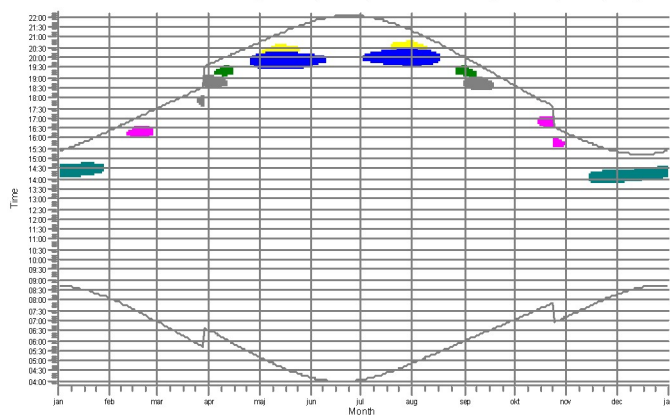
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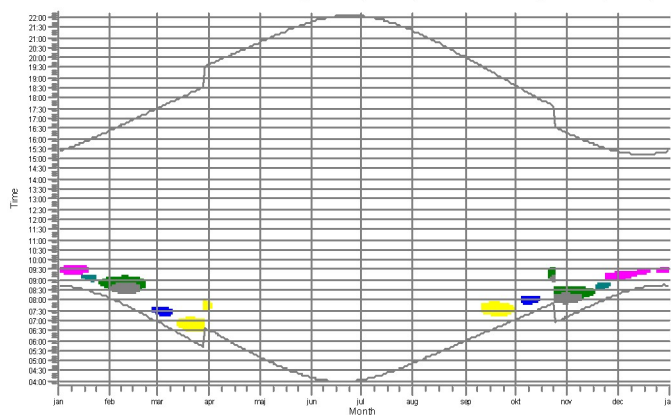
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

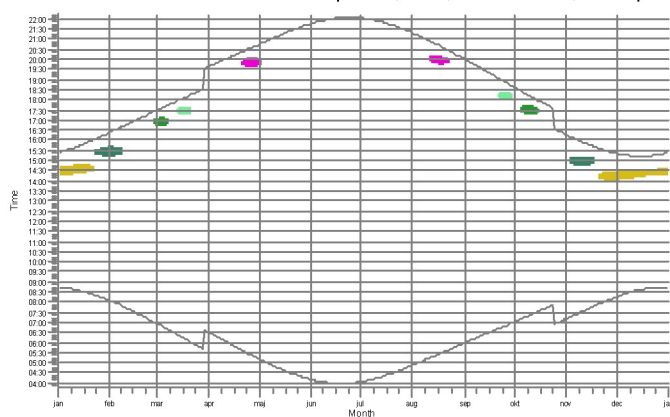
Grevekulla: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



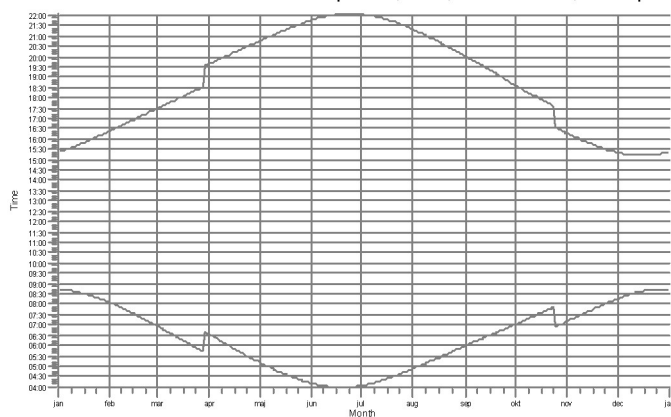
Grevekulla 1:11: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



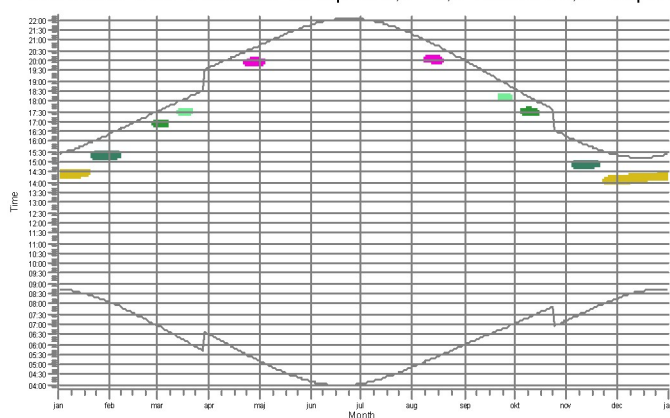
HUSTOMTA 1:10>2: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



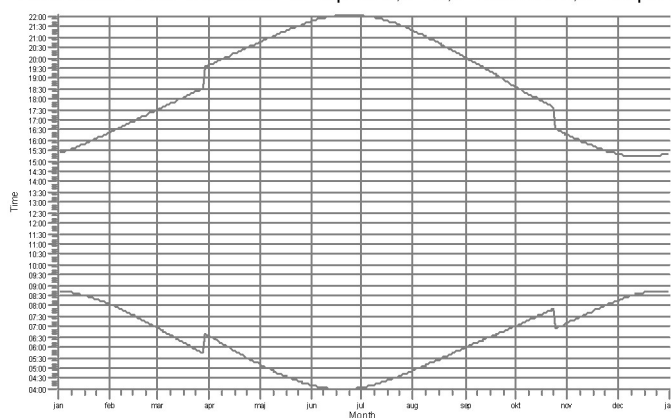
HUSTOMTA 1:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



HUSTOMTA 1:15>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



HUSTOMTA 1:16>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (806)



WTGs

1: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (283)
2: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (284)
3: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (285)
4: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (286)

5: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (287)
6: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (288)
B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)
B0020: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (933)

B0021: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (934)
B0023: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (936)
B0024: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (937)

Project:
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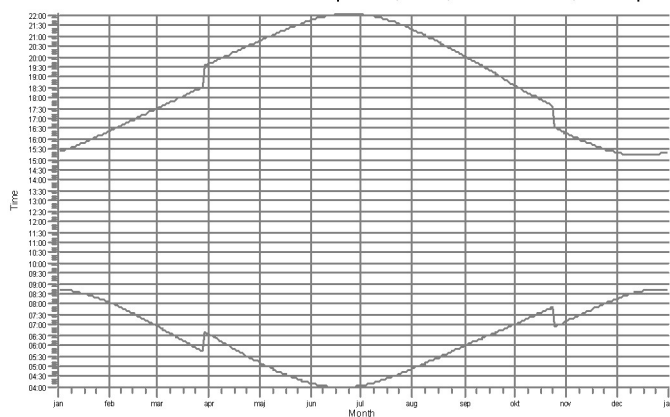
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Calculated:
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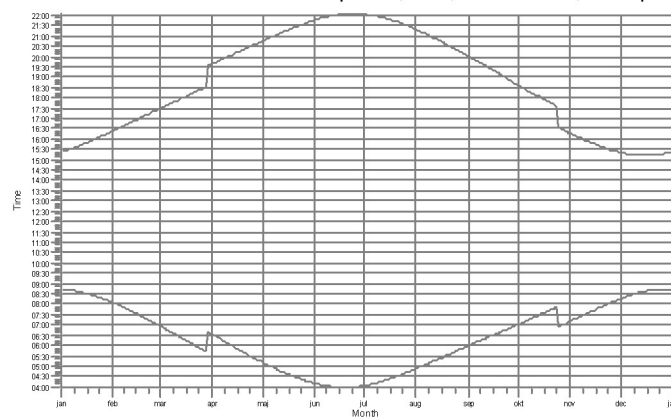
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

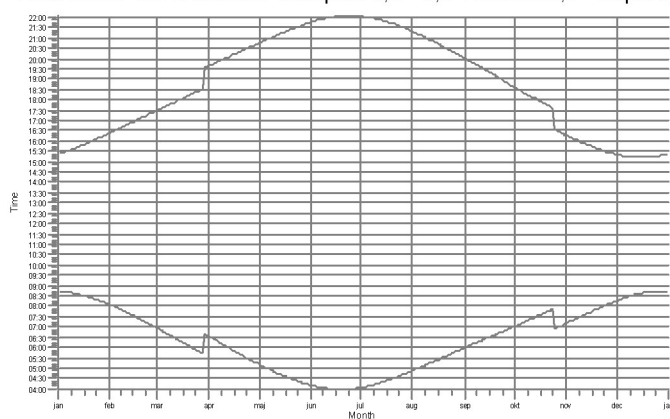
HUSTOMTA 1:17>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



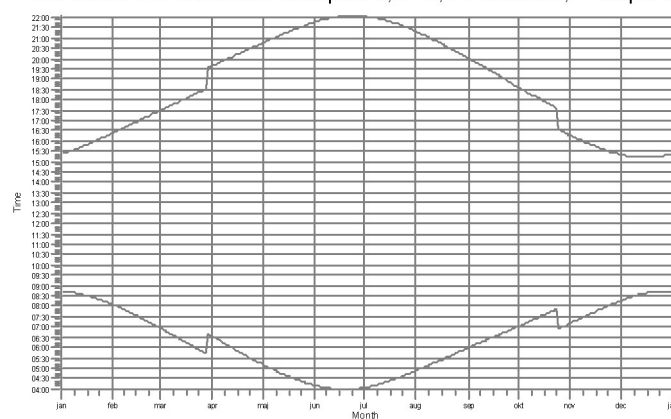
HUSTOMTA 1:17>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



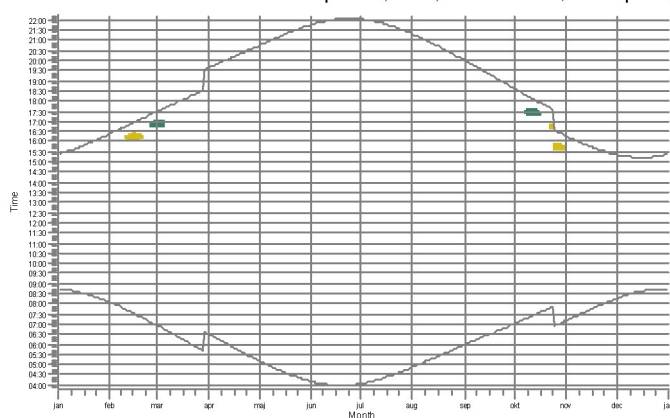
HUSTOMTA 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



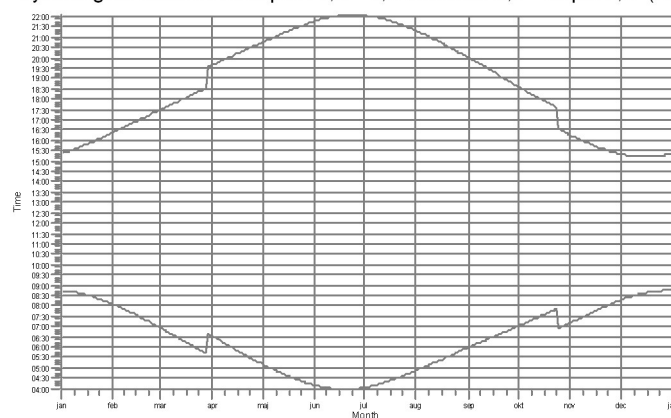
HUSTOMTA 3:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



HUSTOMTA 3:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



Hyltestugan: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (804,



WTGs

B0023: NORDEX N131/3000 3000 131.0 IOL hub: 144,5 m (TOT: 210,0 m) (936)

B0024: NORDEX N131/3000 3000 131.0 IOL hub: 144,5 m (TOT: 210,0 m) (937)

Project:
bruzaholm

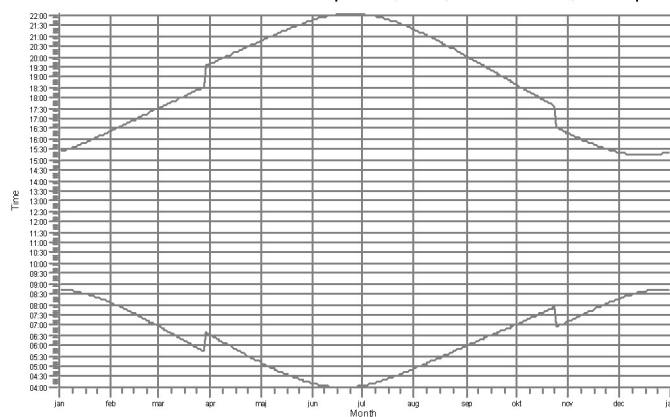
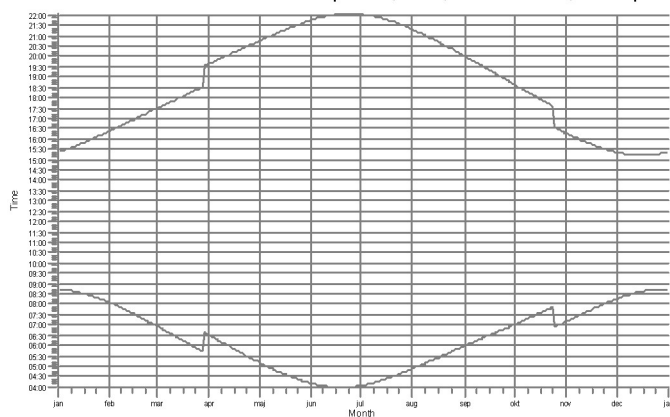
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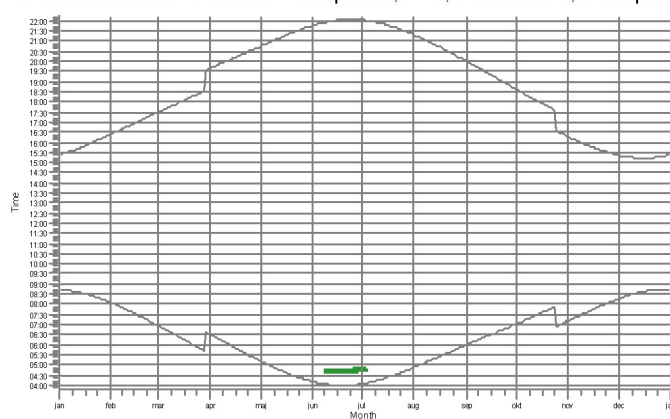
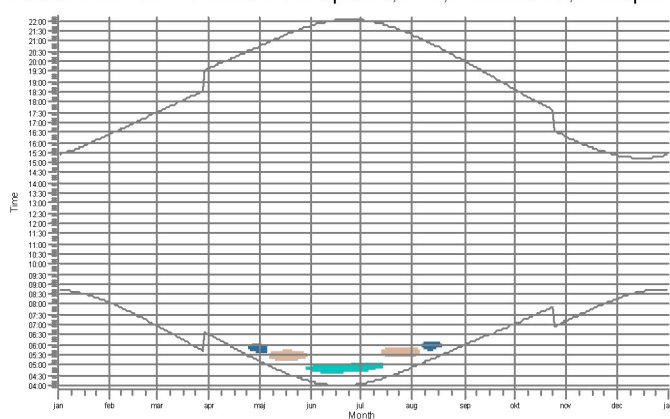
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

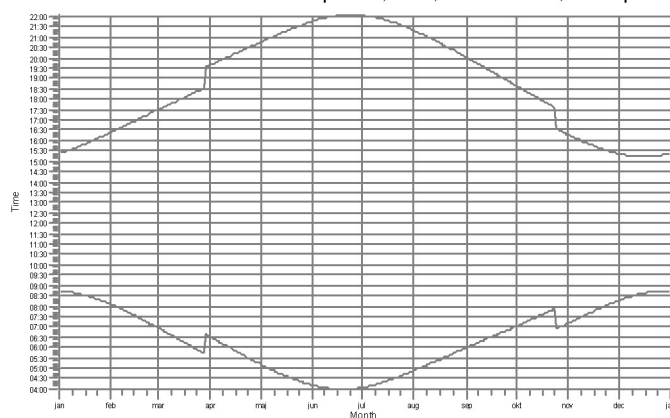
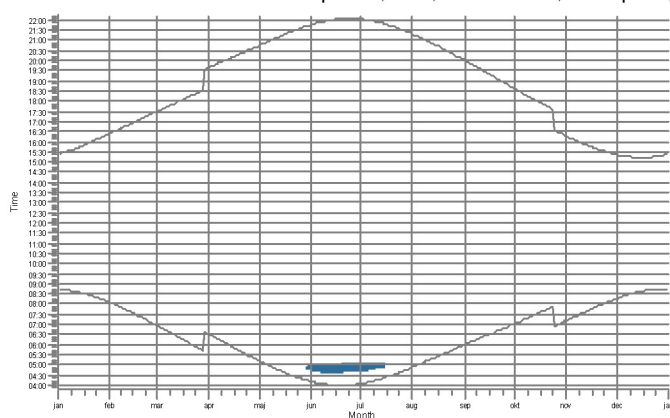
HÄRSTORP 1:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° HÄSSLEÅS 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



HÄSSLEÅS 1:12>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° HÄSSLEÅS 1:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



HÄSSLEÅS 1:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° HÄSSLEÅS 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



WTGs

B0011: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (924)
B0015: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (928)

B0016: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (929)
B0021: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (934)

Project:
bruzaholm

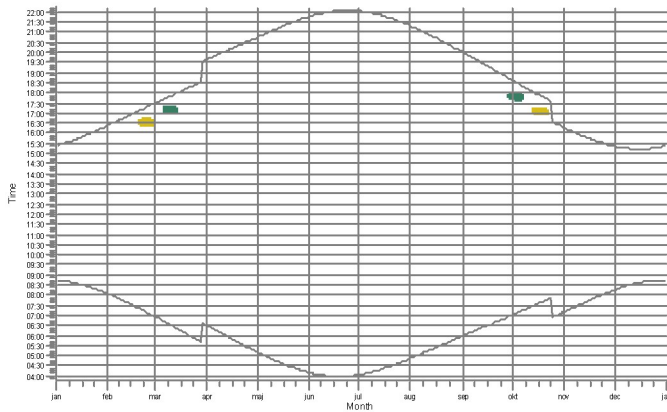
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Calculated:
2017-09-08 18:49/3.1.617

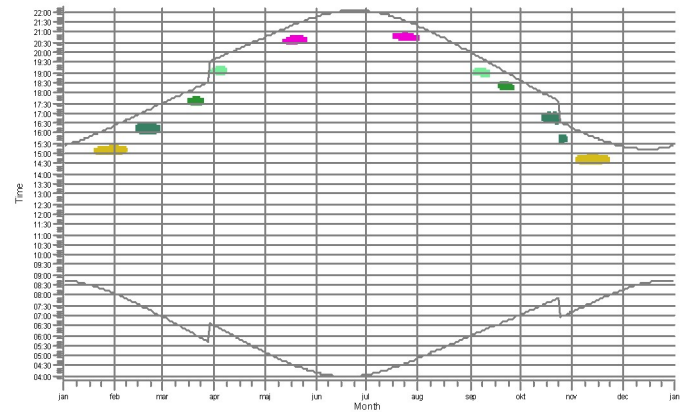
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

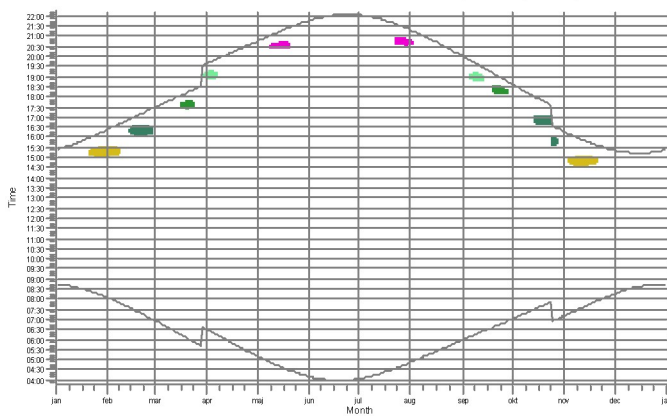
INGATORPS-BJÖRKEBERG 1:2>1: Shadow Receptor: 5,0 × 5,0 Azimuth:



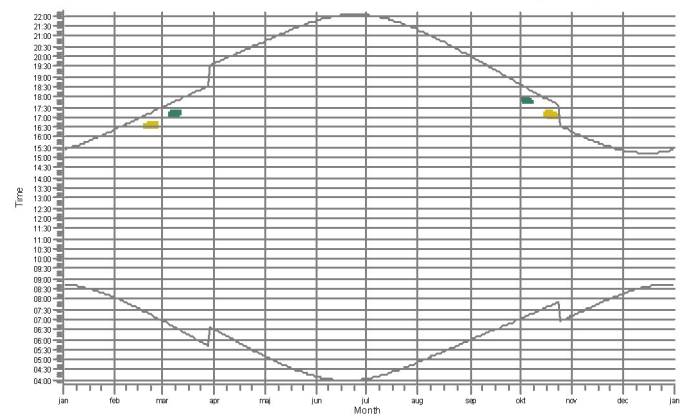
INGATORPS-BJÖRKEBERG 1:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth:



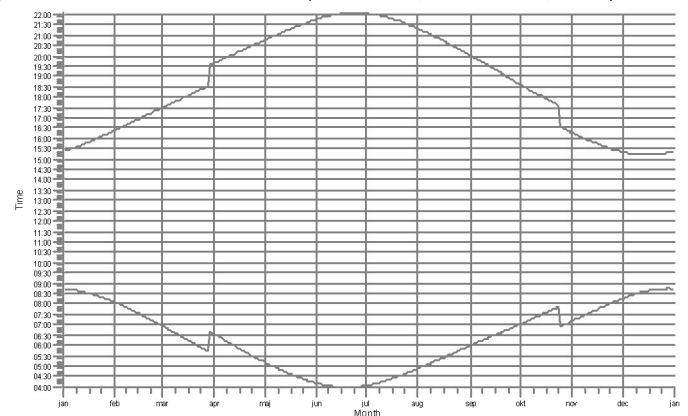
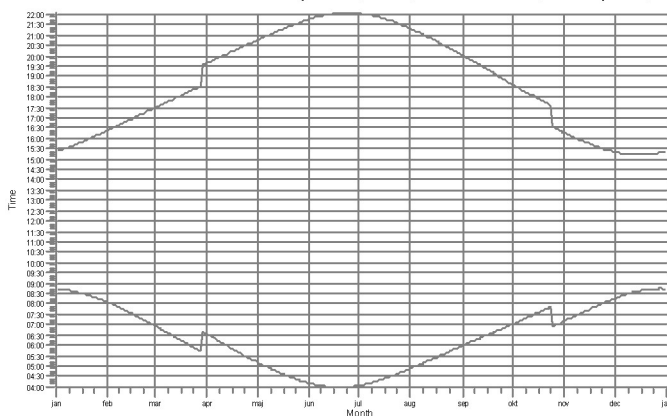
INGATORPS-BJÖRKEBERG 1:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth:



INGATORPS-GRIMMESTORP 2:4>1: Shadow Receptor: 5,0 × 5,0 Azimuth



JUSTORP 1:2>2: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (JUSTORP 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



WTGs

B0018: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (931)
B0020: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (933)

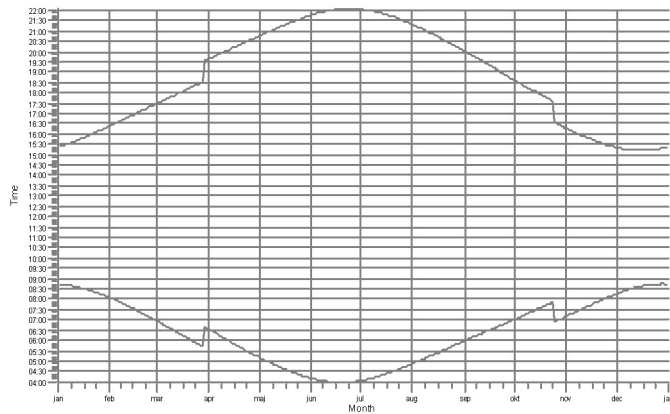
B0021: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (934)
B0023: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (936)

B0024: NORDEX N131/3000 3000 131.0 IOf hub: 144,5 m (TOT: 210,0 m) (937)

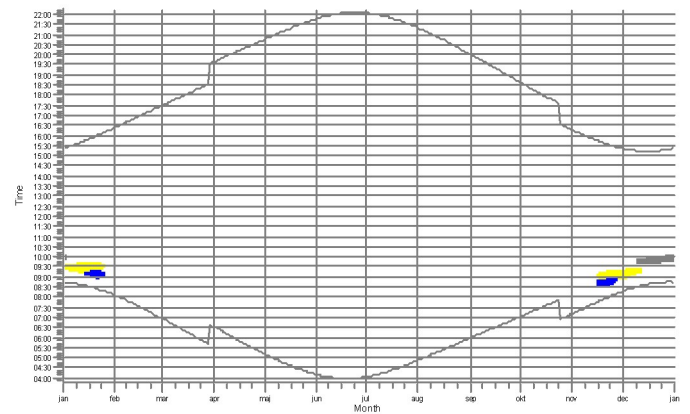
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

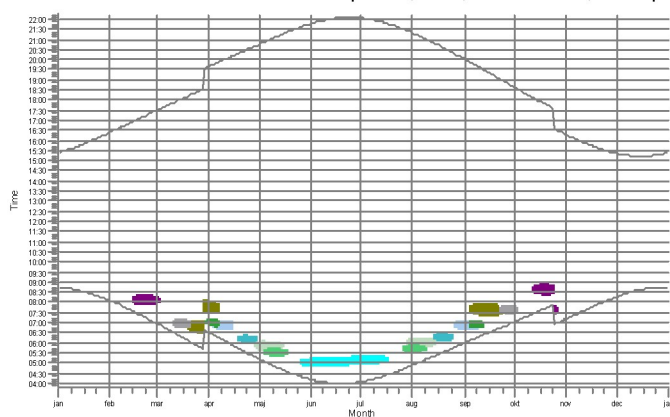
JUSTORP 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



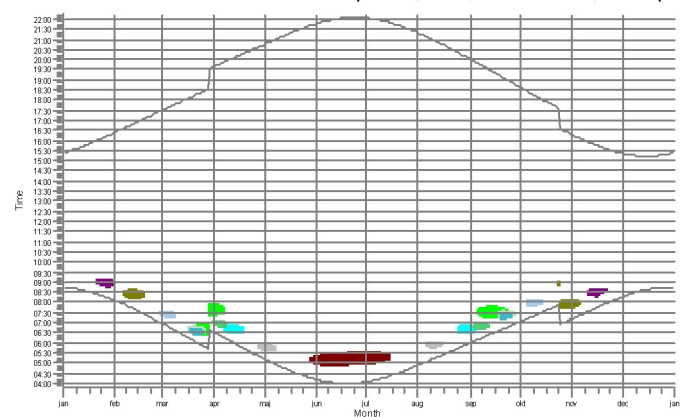
Jonsberg: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (803)



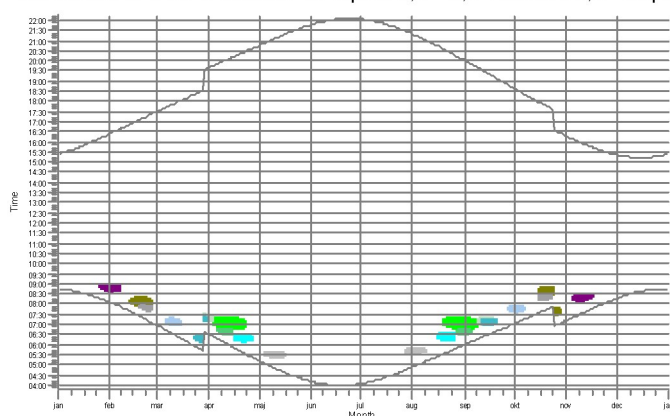
KONGSERYD 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



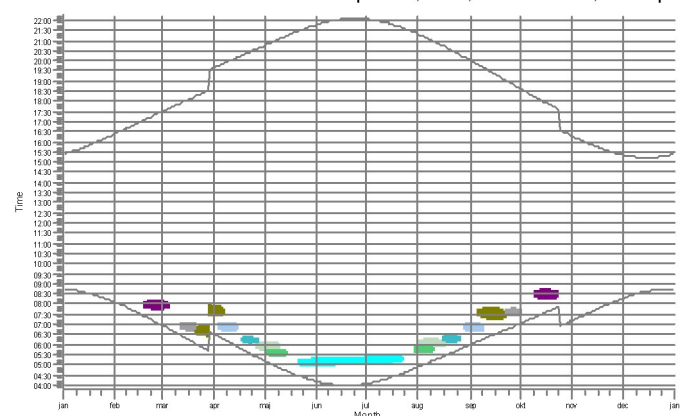
KONGSERYD 1:17>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



KONGSERYD 1:18>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



KONGSERYD 1:19>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (



WTGs

2: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (284)	B0004: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (917)	B0009: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (922)
3: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (285)	B0005: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (918)	B0010: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (923)
4: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (286)	B0006: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (919)	B0013: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (926)
B0002: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (915)	B0007: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (920)	B0014: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (927)
B0003: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (916)	B0008: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (921)	B0022: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (935)

Project:
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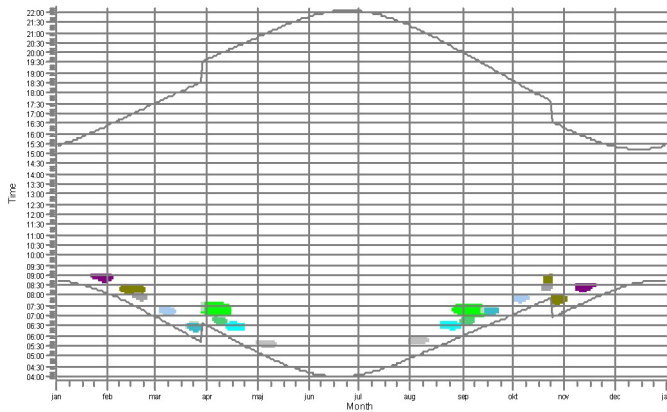
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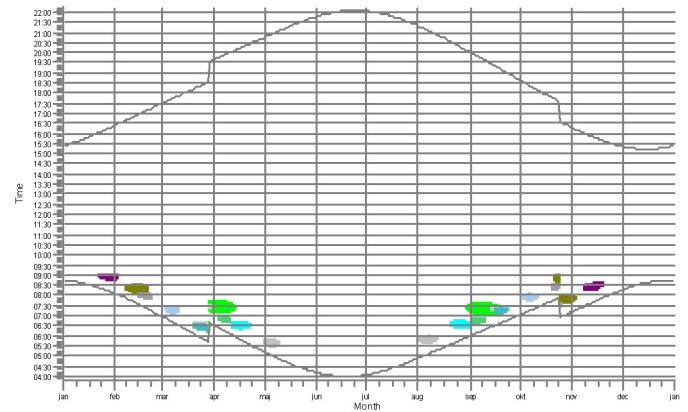
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

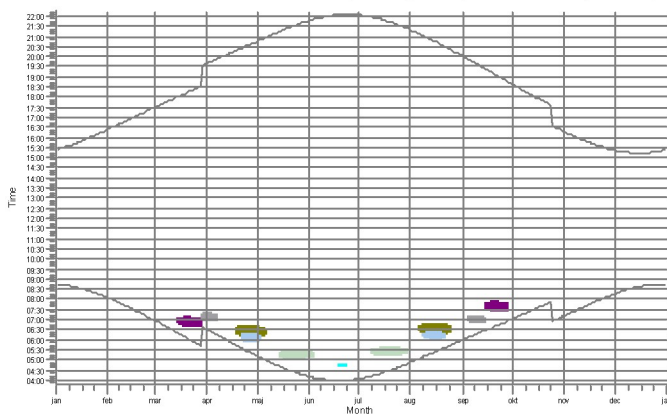
KONGSERYD 1:20>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



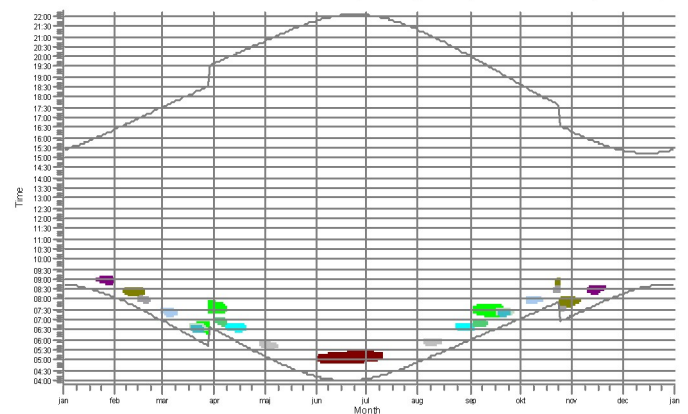
KONGSERYD 1:22>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



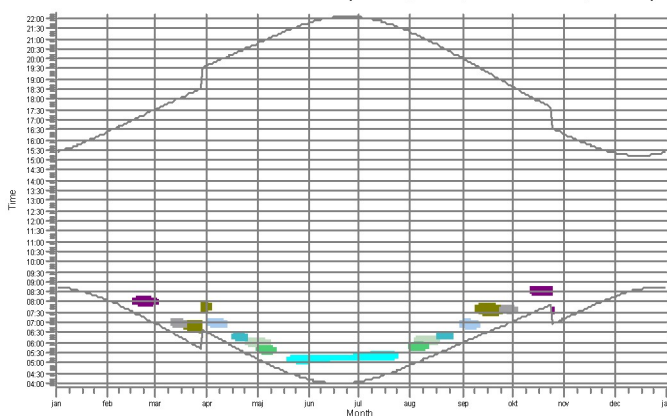
KONGSERYD 1:23>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



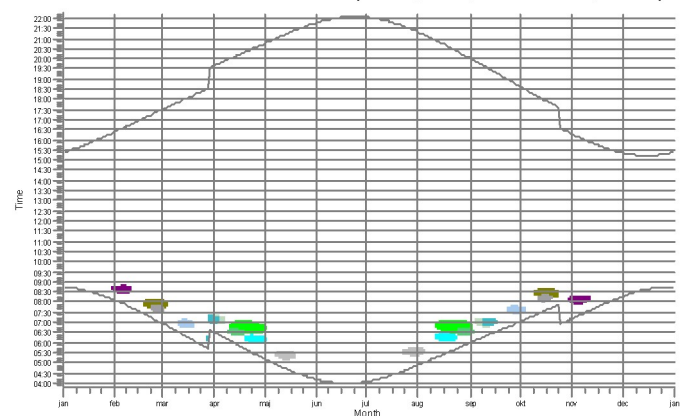
KONGSERYD 1:24>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



KONGSERYD 1:25>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



KONGSERYD 1:26>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 1



WTGs

B0002: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (915)
B0003: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (916)
B0004: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (917)
B0005: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (918)

B0006: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (919)
B0007: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (920)
B0008: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (921)
B0009: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (922)

B0010: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (923)
B0013: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (926)
B0022: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (935)

Project:
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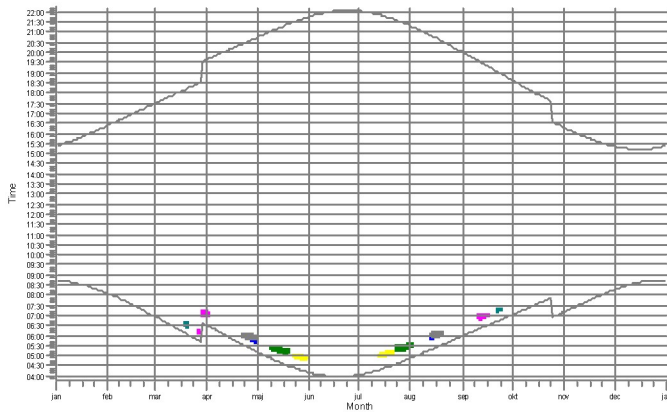
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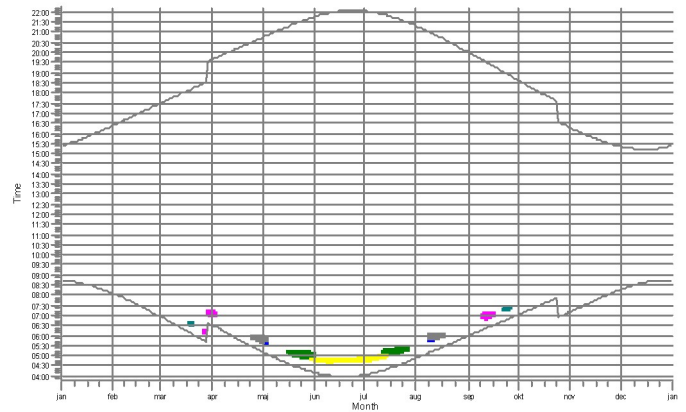
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

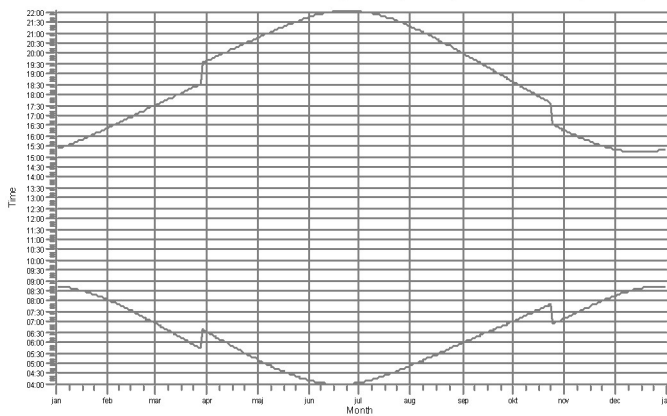
LILLA HESTER 2:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



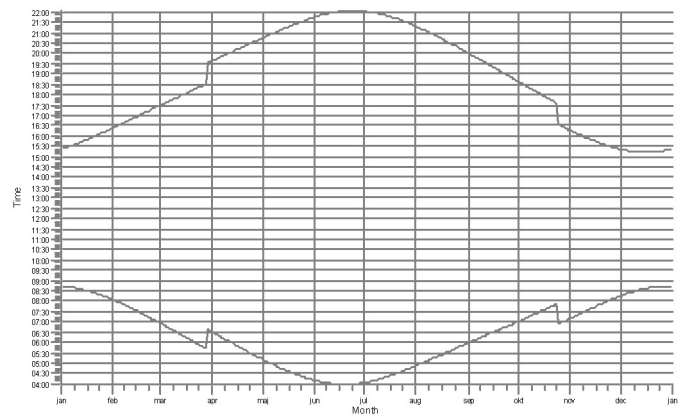
LILLA HESTER 2:2>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



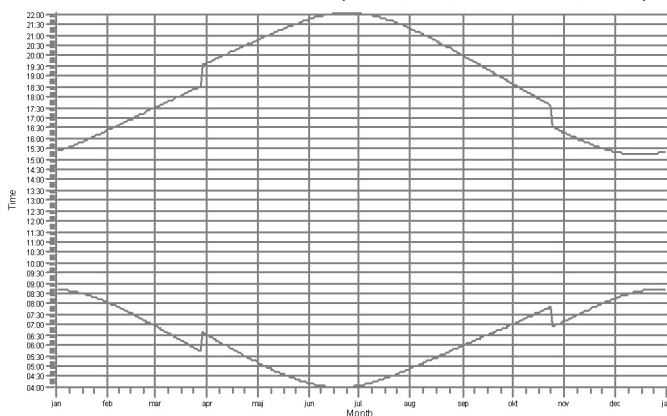
LÖVSEHULT 1:20>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



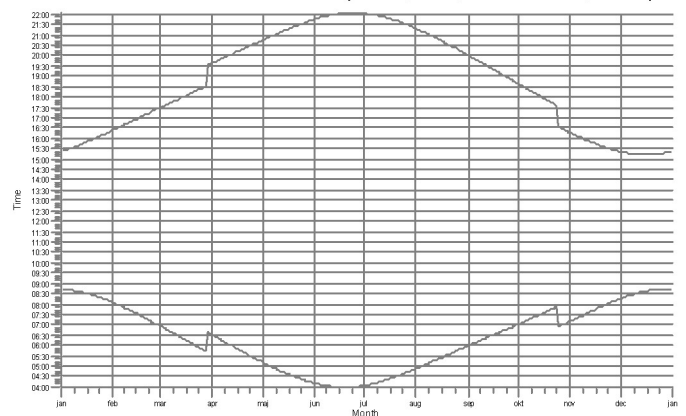
LÖVSEHULT 1:21>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



LÖVSEHULT 1:23>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



LÖVSEHULT 1:24>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0°



WTGs

1: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (283)
2: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (284)

3: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (285)
4: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (286)

5: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (287)
6: VESTAS V117-3.3 GridStream 3300 117.0 IOf hub: 91,5 m (TOT: 150,0 m) (288)

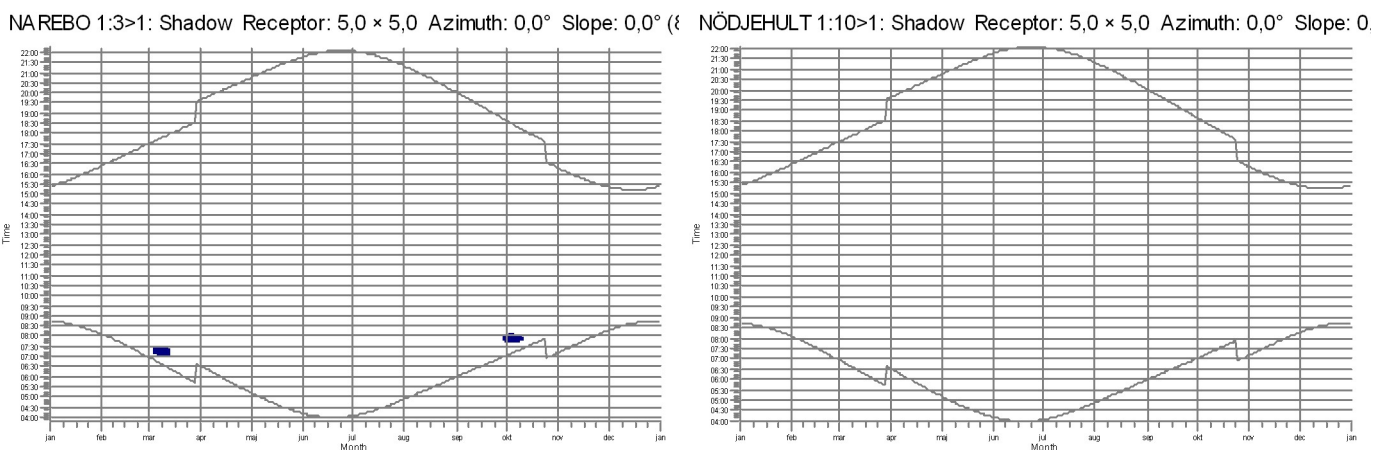
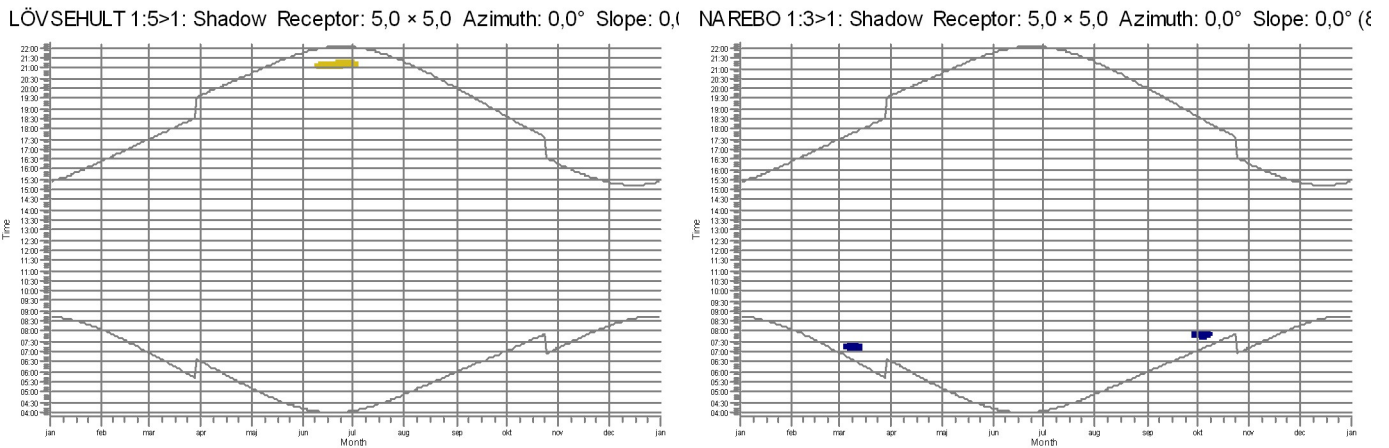
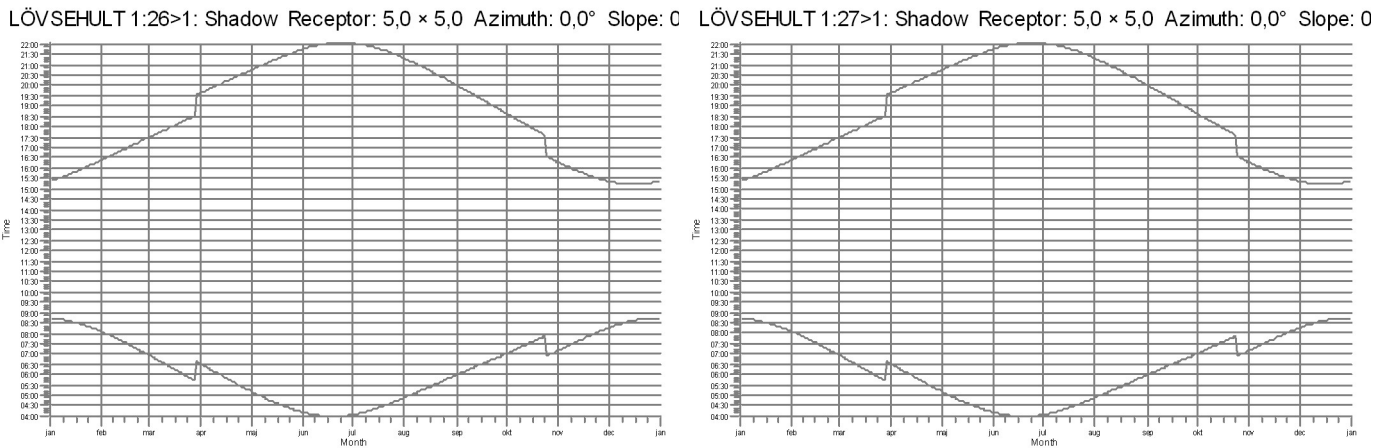
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SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m



WTGs

B0001: NORDEX N131/3000 3000 131.0 IOL hub: 144,5 m (TOT: 210,0 m) (914) B0024: NORDEX N131/3000 3000 131.0 IOL hub: 144,5 m (TOT: 210,0 m) (937)

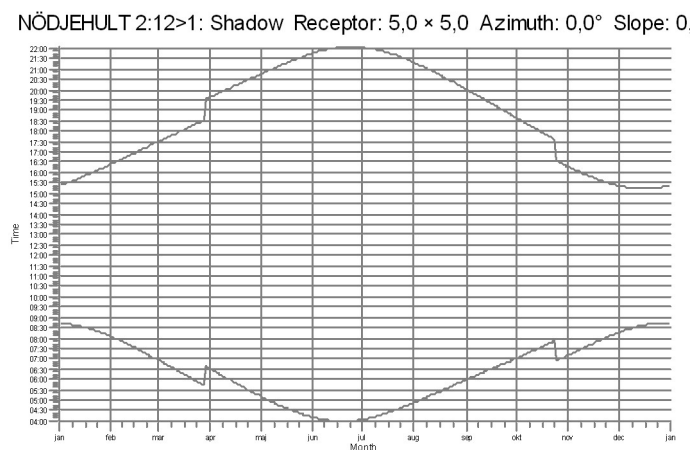
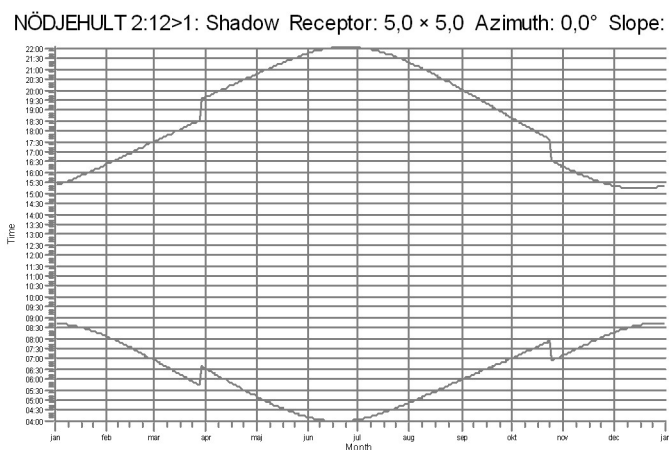
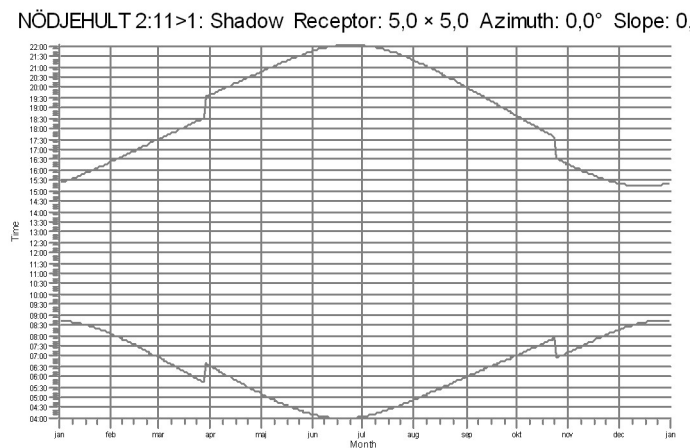
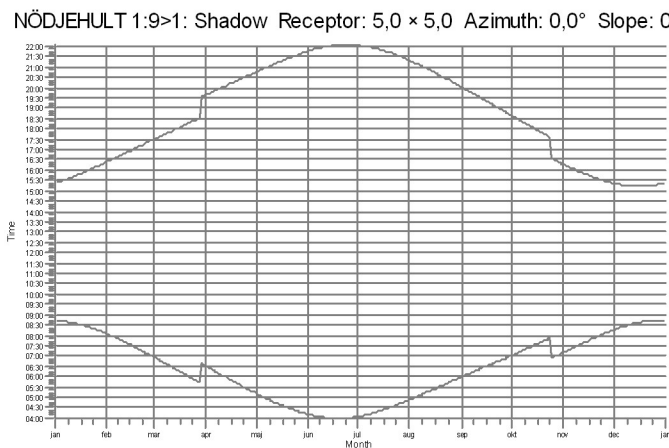
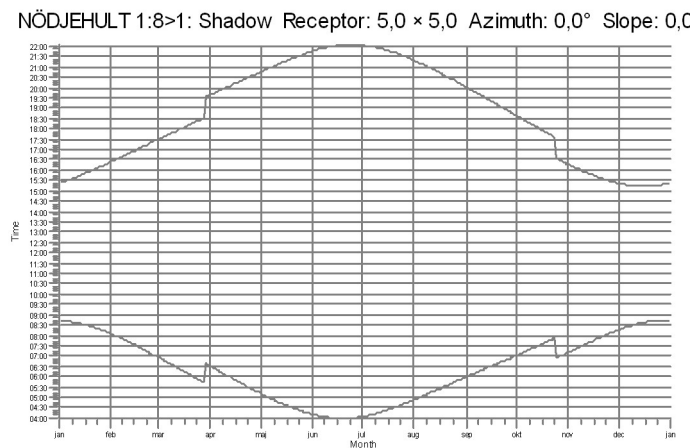
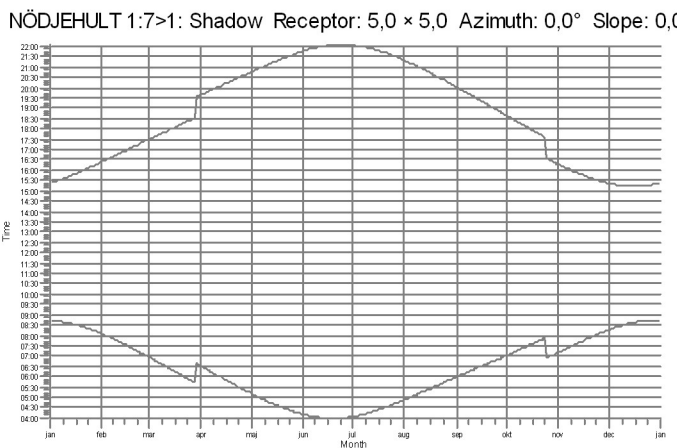
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SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m



WTGs

Project:
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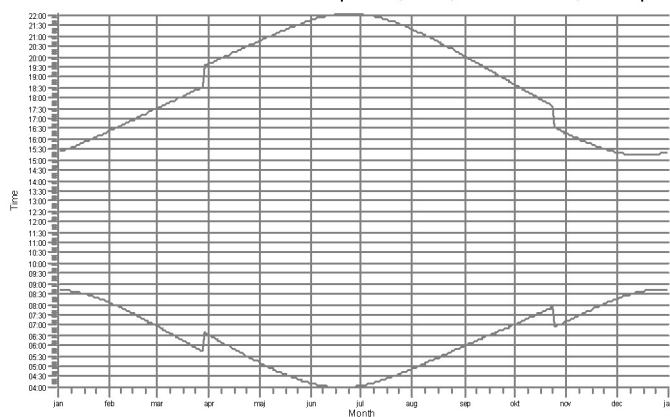
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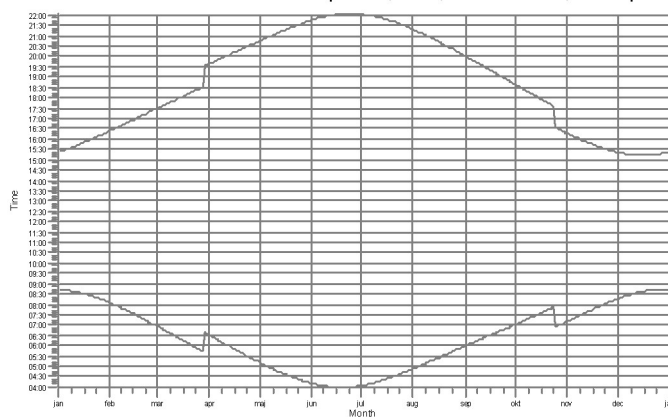
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

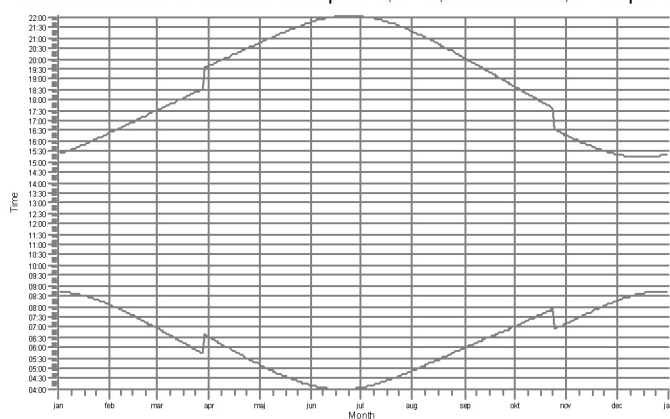
NÖDJEHULT 2:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



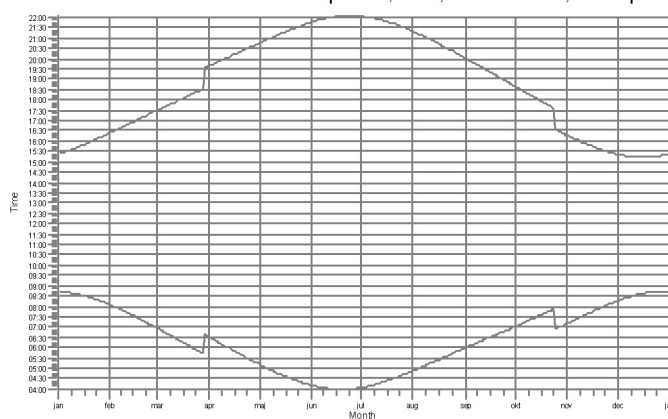
NÖDJEHULT 4:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



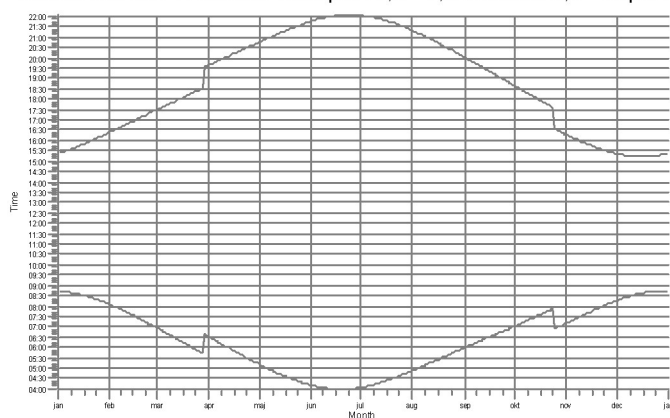
NÖDJEHULT 5:2>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



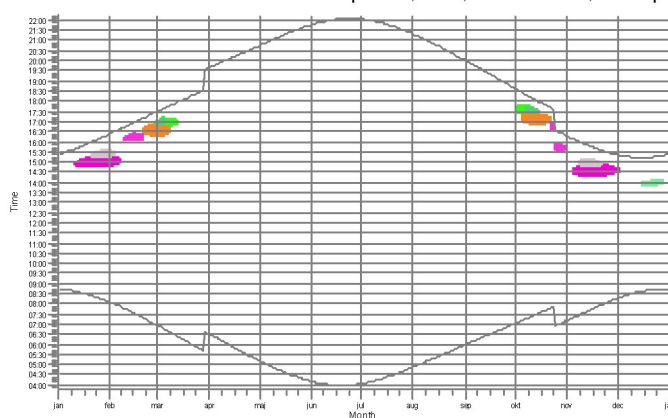
NÖDJEHULT 5:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



NÖDJEHULT 5:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



PASSAMÅLEN 1:3>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



WTGs

B0012: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (925)
B0017: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (930)
B0018: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (931)

B0019: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (932)
B0020: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (933)
B0022: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (935)

B0025: NORDEX N131/3000 3000 131.0 Ht hub: 144,5 m (TOT: 210,0 m) (938)

Project:
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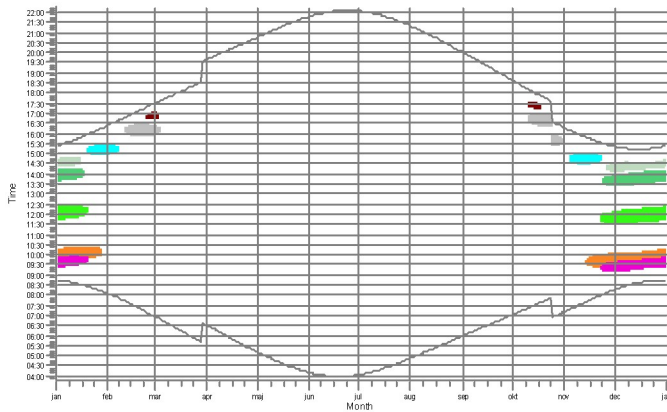
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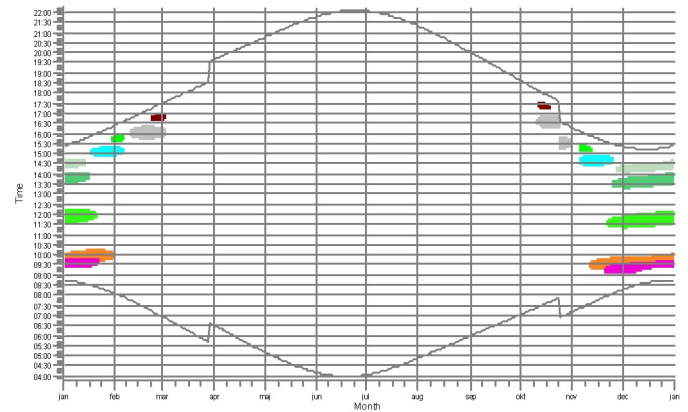
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

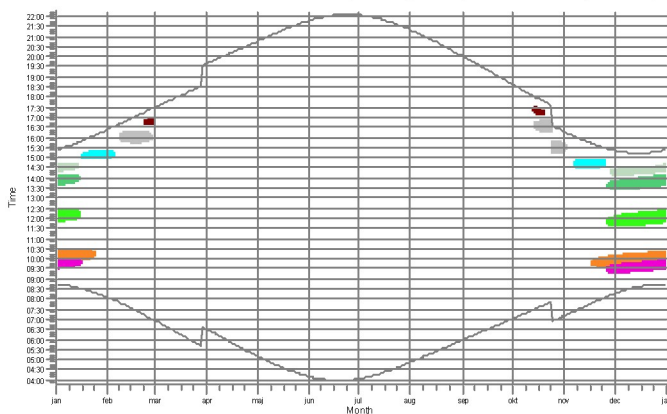
PASSAMÅLEN 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



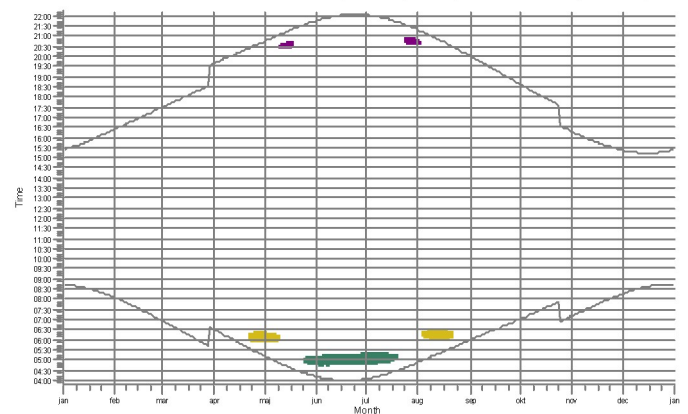
PASSAMÅLEN 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



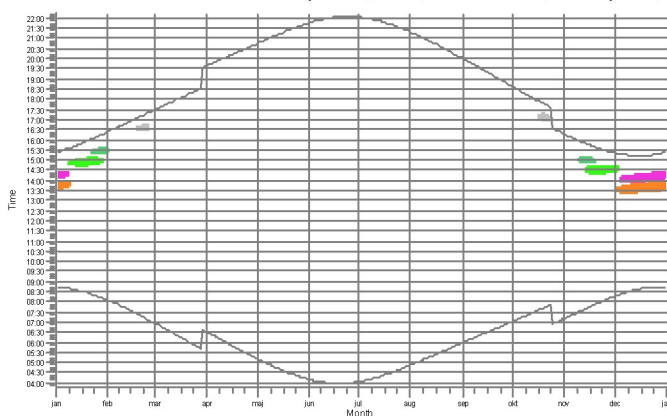
PASSAMÅLEN 1:8>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



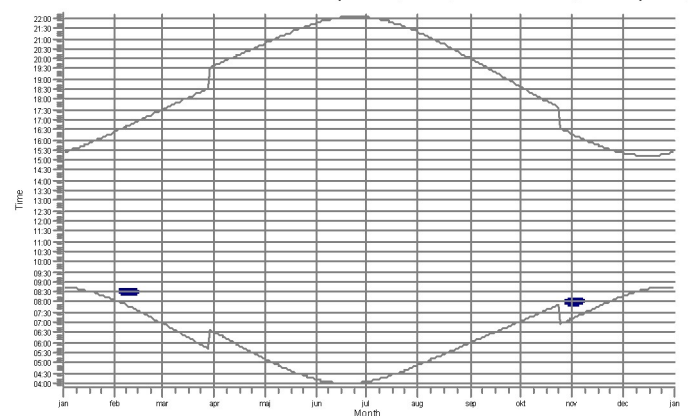
SKÅLJARYD 1:5>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



SPINKARP 1:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



STENSGÖL 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



WTGs

B0001: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (914)
B0002: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (915)
B0003: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (916)
B0005: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (918)
B0006: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (919)

B0007: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (920)
B0008: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (921)
B0012: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (925)
B0017: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (930)
B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)

B0022: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (935)
B0023: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (936)
B0024: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (937)
B0025: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (938)

Project:
bruzaholm

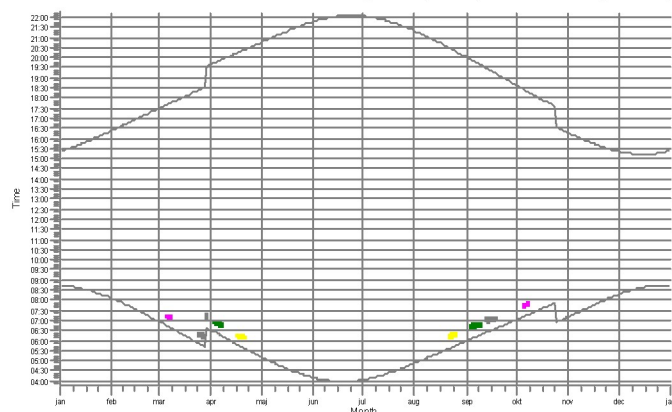
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Calculated:
2017-09-08 18:49/3.1.617

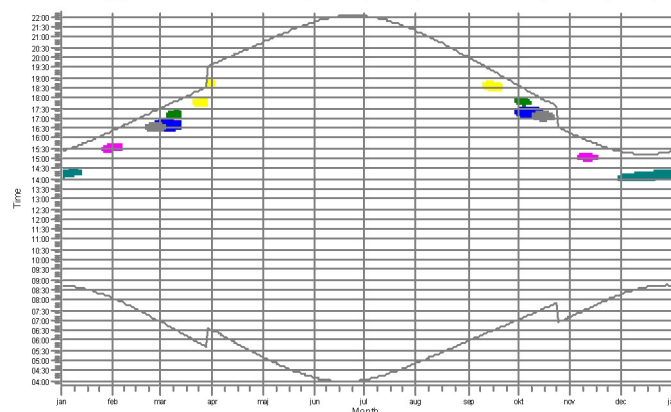
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

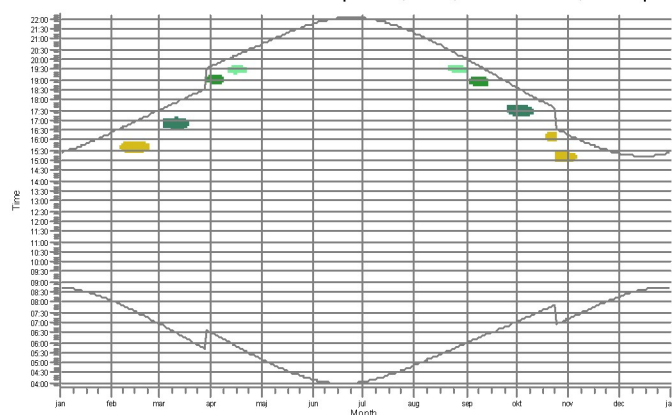
STORA HESTER 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



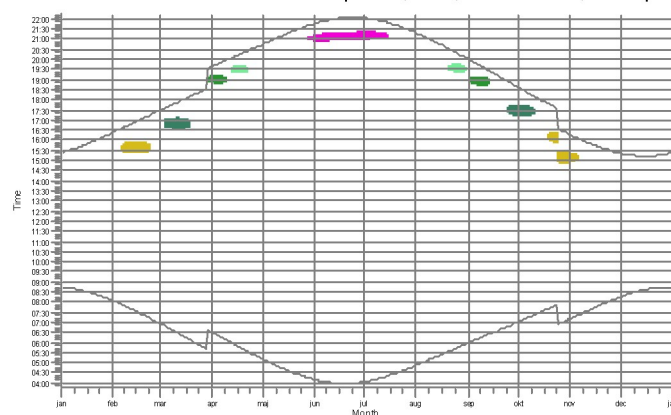
Stora Gluggebo: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° (i



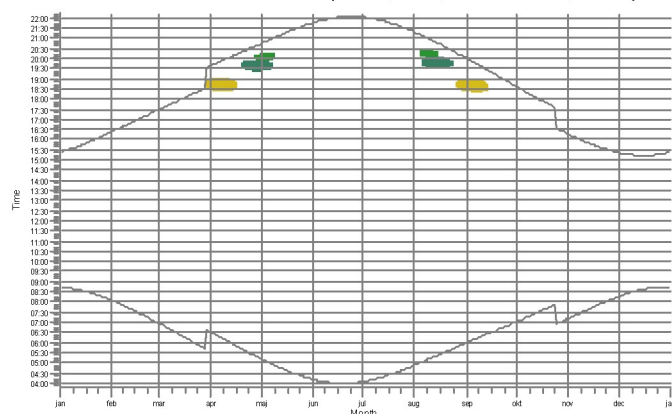
SÄLDEFALL 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



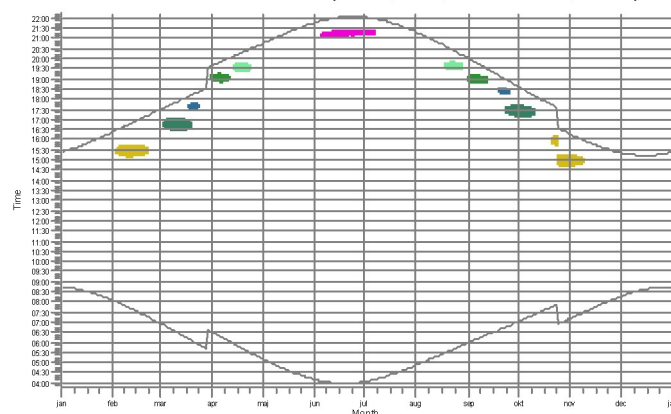
SÄLDEFALL 1:12>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0



SÄLDEFALL 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



SÄLDEFALL 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



WTGs

1: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (283)
2: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (284)
3: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (285)
4: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (286)

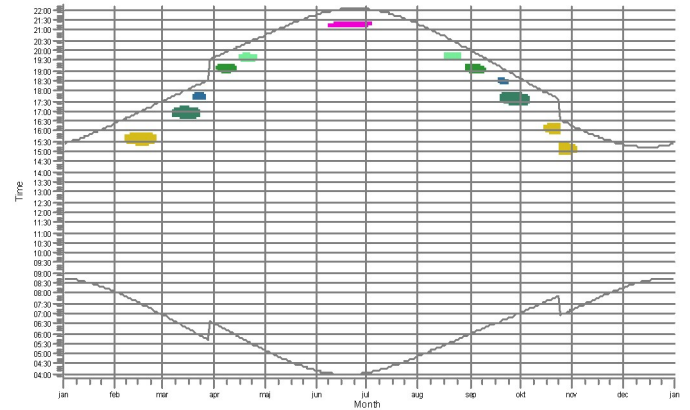
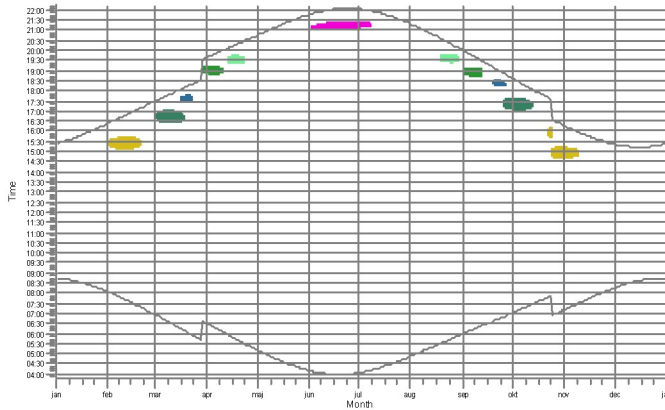
5: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (287)
6: VESTAS V117-3.3 GridStream 3300 117.0 IOI hub: 91,5 m (TOT: 150,0 m) (288)
B0016: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (929)
B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)

B0020: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (933)
B0021: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (934)
B0023: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (936)
B0024: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (937)

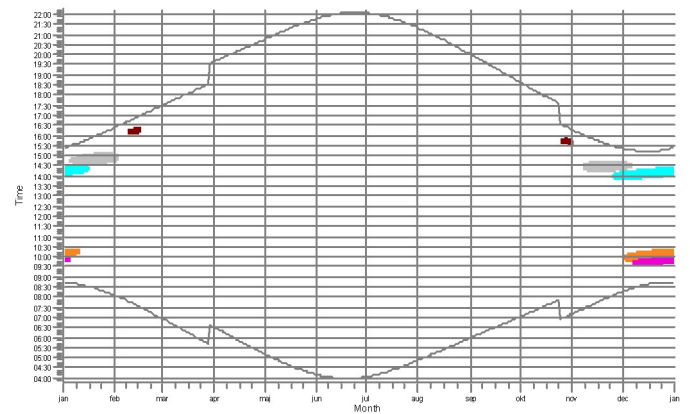
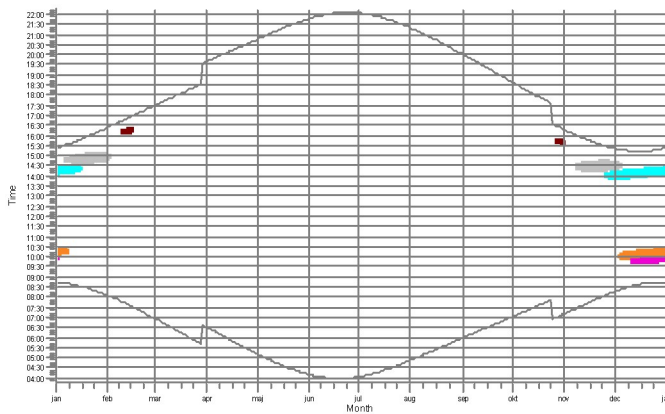
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

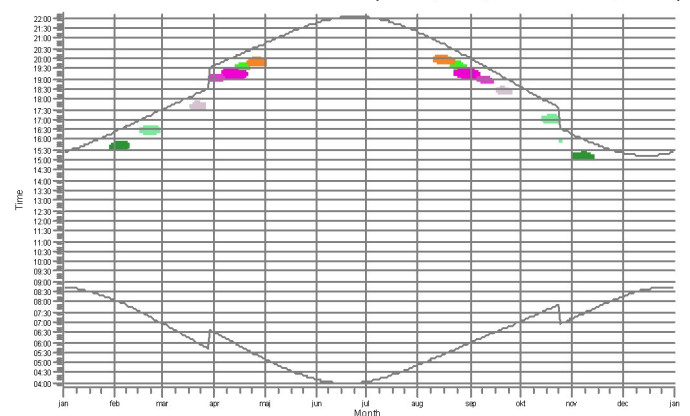
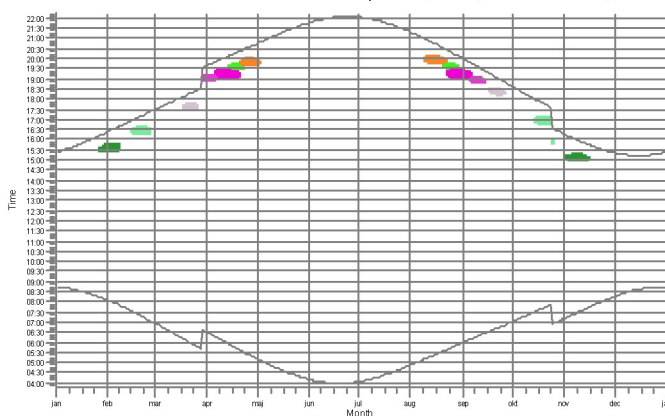
SÄLDEFALL 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° SÄLDEFALL 1:8>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



VASSEMALA 1:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° VASSEMALA 1:1>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



VÄSTRA EKAS 1:10>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0° VÄSTRA EKAS 1:10>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0°



WTGs

B0002: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (915)
B0006: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (919)
B0007: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (920)
B0012: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (925)
B0016: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (929)

B0017: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (930)
B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)
B0019: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (932)
B0020: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (933)
B0021: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (934)

B0023: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (936)
B0024: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (937)
B0025: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (938)

Project:
bruzaholm

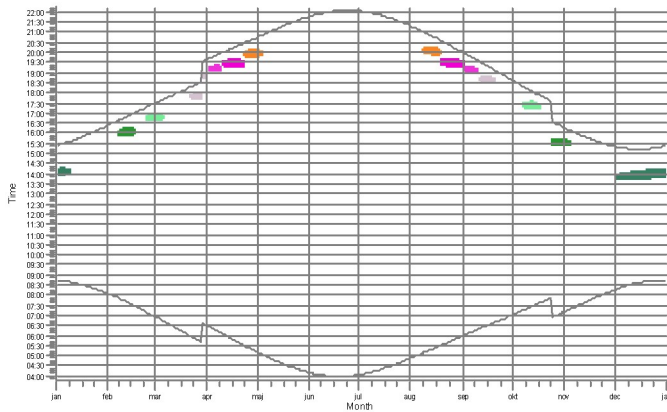
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Calculated:
2017-09-08 18:49/3.1.617

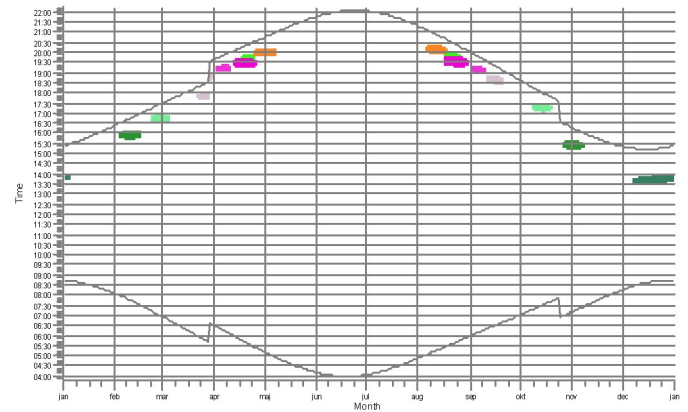
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

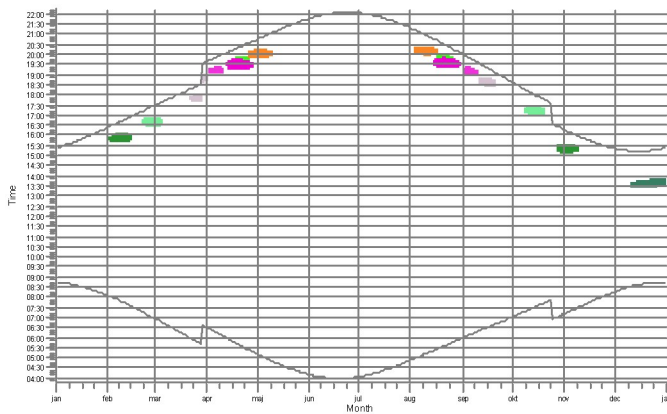
VÄSTRA EKÄS 1:13>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



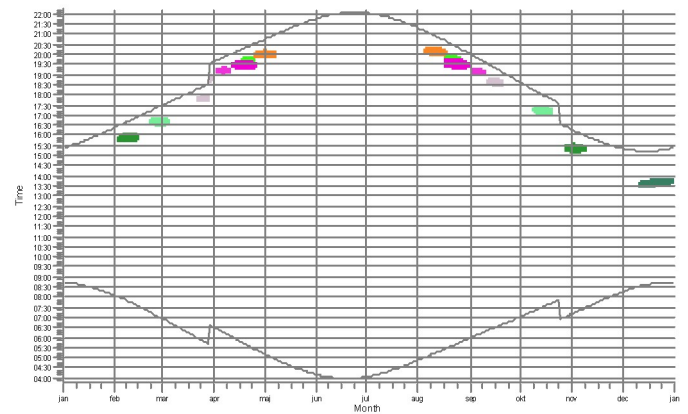
VÄSTRA EKÄS 1:14>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



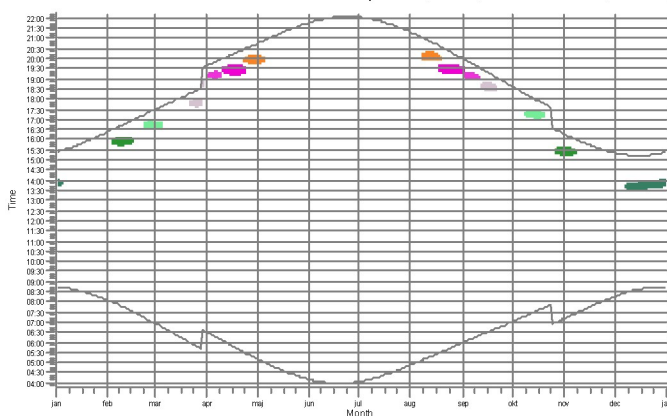
VÄSTRA EKÄS 1:15>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



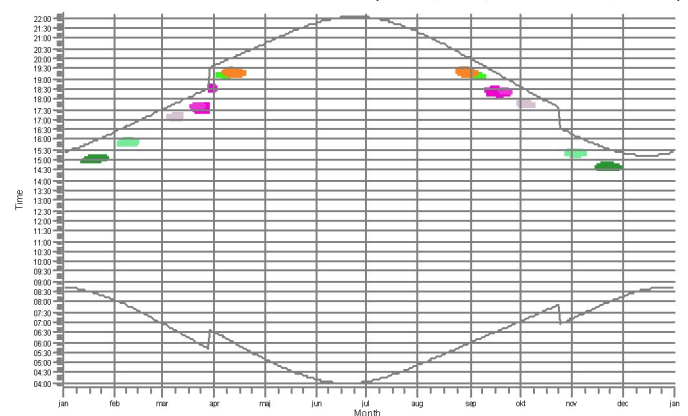
VÄSTRA EKÄS 1:15>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



VÄSTRA EKÄS 1:16>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



VÄSTRA EKÄS 1:17>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope



WTGs

B0012: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (925)	B0019: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (932)	B0023: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (936)
B0017: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (930)	B0020: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (933)	B0025: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (938)
B0018: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (931)	B0021: NORDEX N131/3000 3000 131.0 IOI hub: 144,5 m (TOT: 210,0 m) (934)	

Project:
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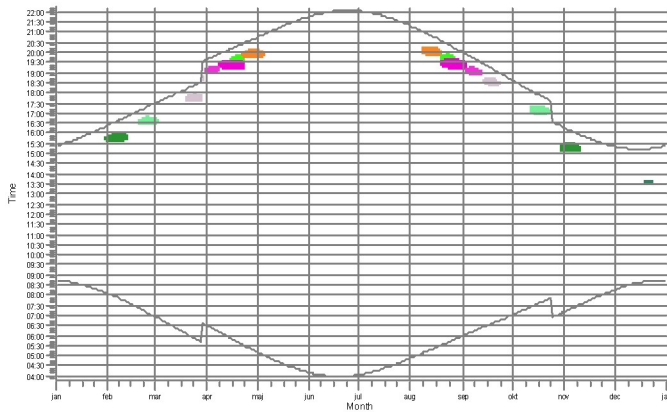
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Calculated:
2017-09-08 18:49/3.1.617

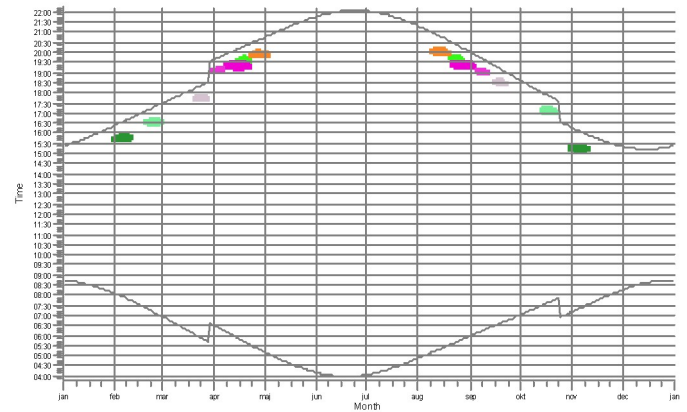
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

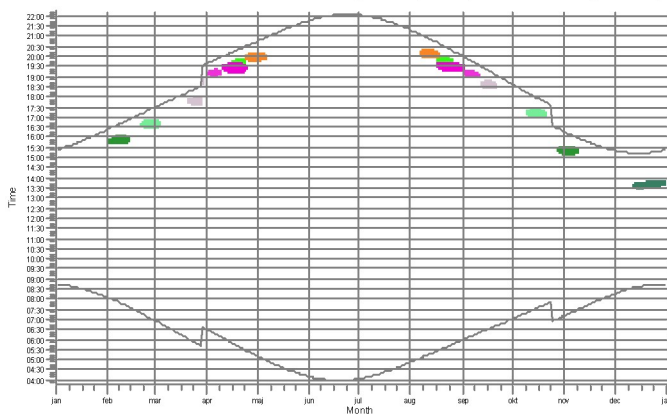
VÄSTRA EKÅS 1:18>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope:



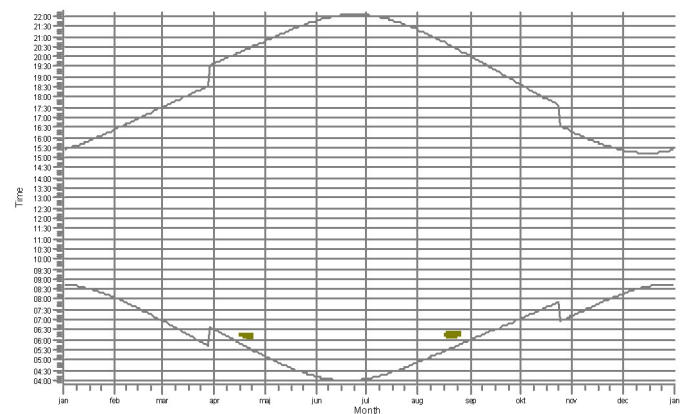
VÄSTRA EKÅS 1:19>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope:



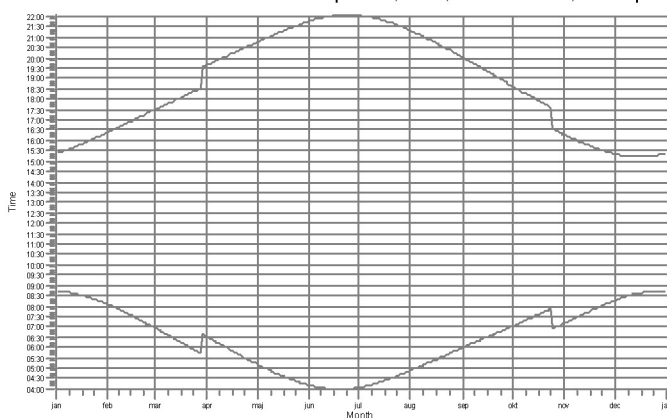
VÄSTRA EKÅS 1:7>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope:



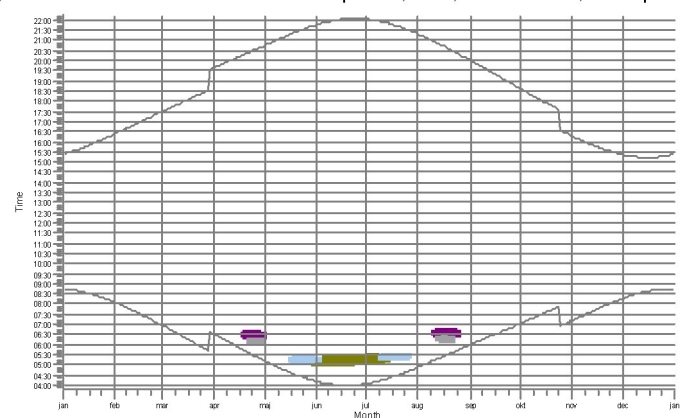
ÄGERSGÖL 1:11>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



ÄGERSGÖL 1:14>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



ÄGERSGÖL 1:15>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



WTGs

B0004: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (917)
B0005: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (918)
B0009: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (922)
B0010: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (923)

B0012: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (925)
B0017: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (930)
B0018: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (931)
B0019: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (932)

B0020: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (933)
B0021: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (934)
B0023: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (936)
B0025: NORDEX N131/3000 3000 131.0 HOI hub: 144,5 m (TOT: 210,0 m) (938)

Project:
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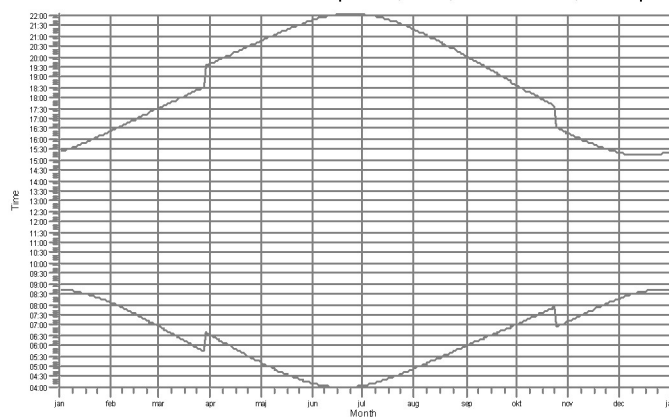
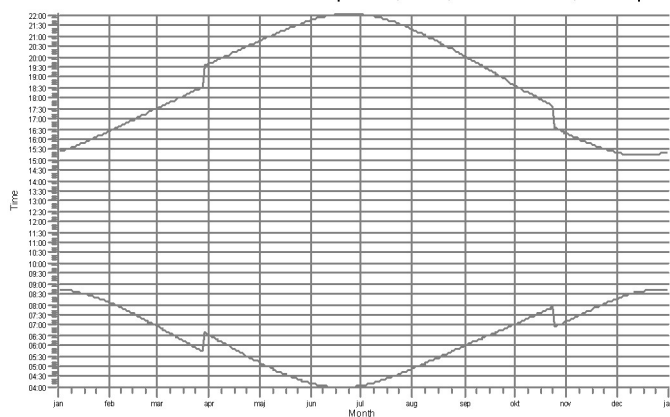
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Calculated:
2017-09-08 18:49/3.1.617

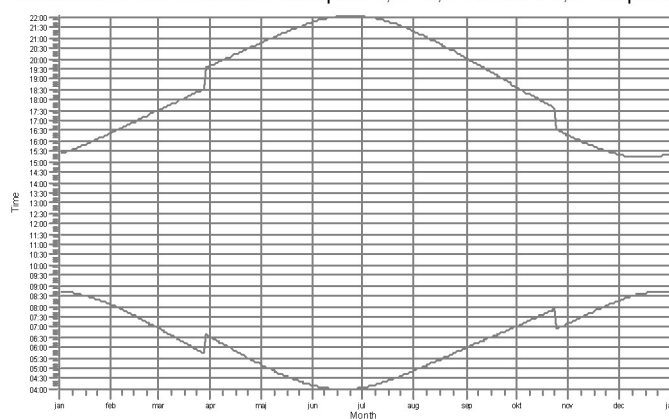
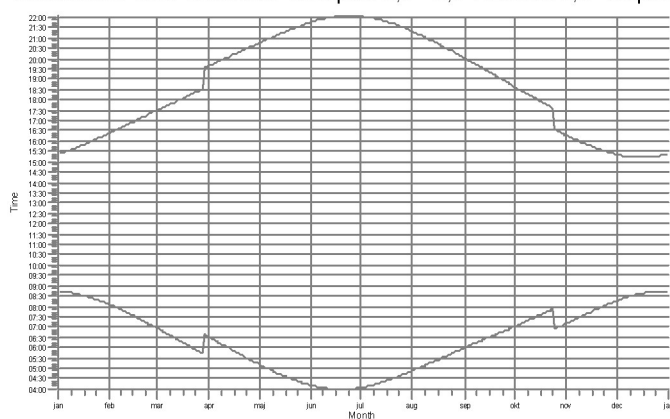
SHADOW - Calendar, graphical

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

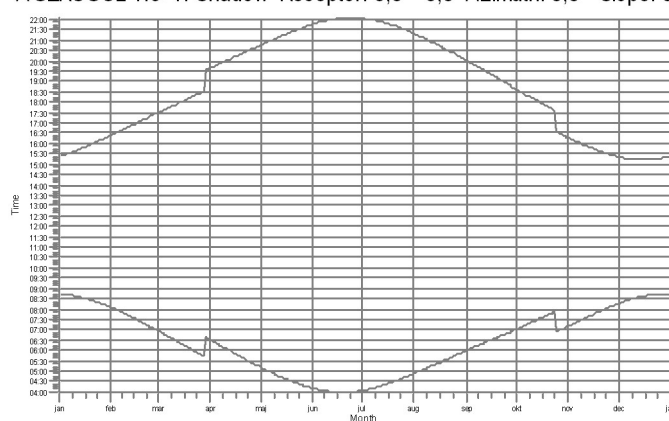
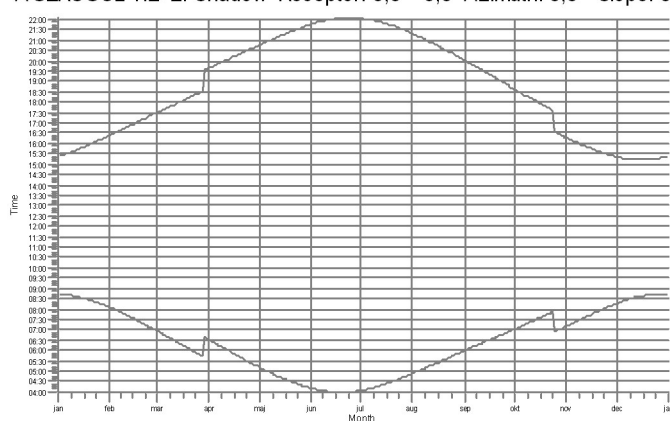
ÄGERSGÖL 1:16>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0, ÄGERSGÖL 1:17>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,



ÄGERSGÖL 1:18>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0, ÄGERSGÖL 1:2>2: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



ÄGERSGÖL 1:2>2: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0 ÄGERSGÖL 1:6>1: Shadow Receptor: 5,0 × 5,0 Azimuth: 0,0° Slope: 0,0



WTGs

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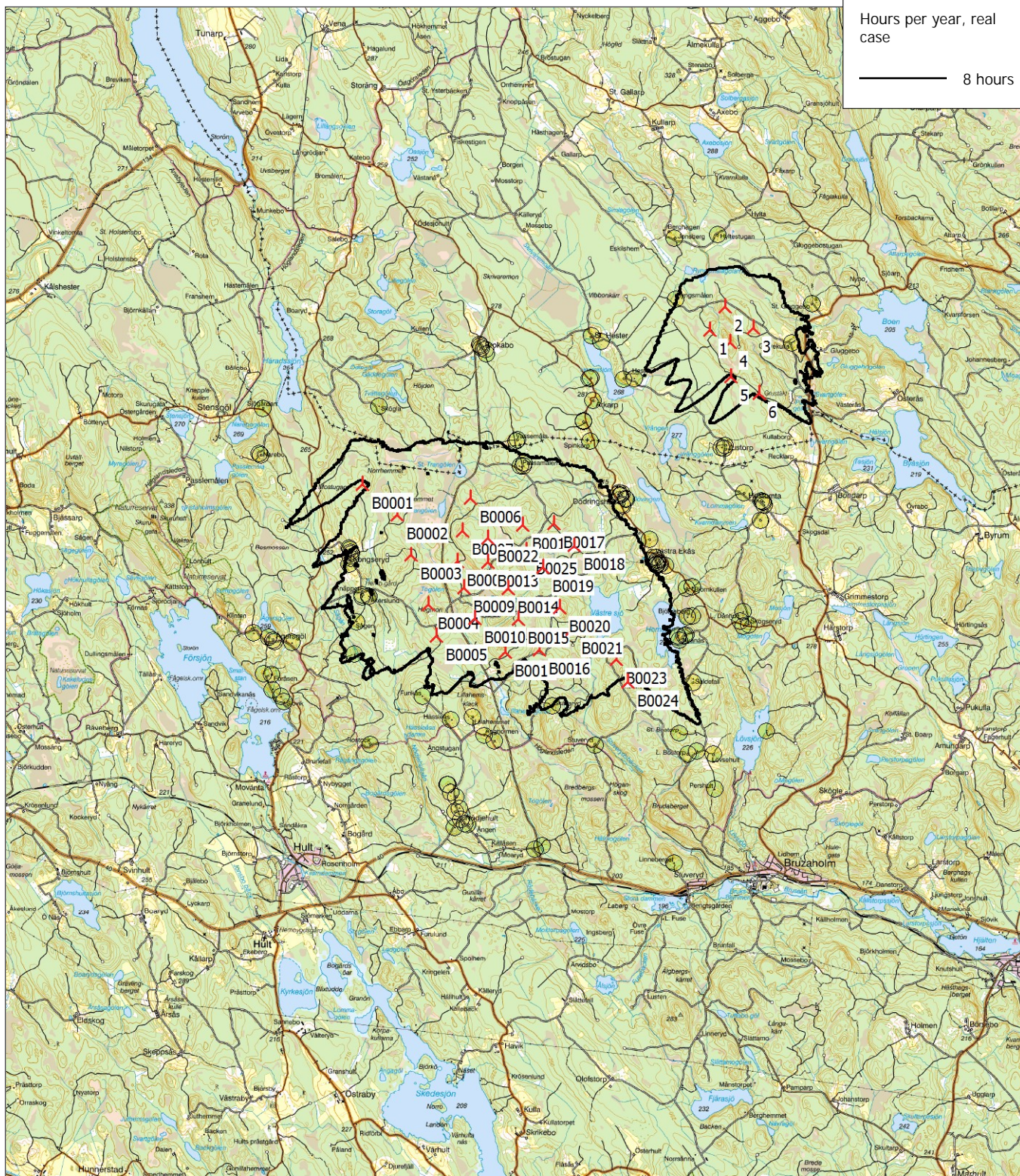
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Calculated:
2017-09-08 18:49/3.1.617

SHADOW - Map

Calculation: B_LSBH006 - 25 x N131-3.0 hh144,5m + Grevekulla 6xV117 3.3 hh91,5m

Hours per year, real case

8 hours



0 1 2 3 4 km

Map: Bitmap map: 1. Maps , Print scale 1:100 000, Map center Swedish UTM 33-SWREF99 (SE) East: 511 550 North: 6 393 650

▲ New WTG

● Shadow receptor

Flicker map level: Height Contours: Hk 2m + 5m uttunnad(1).wpo (2)