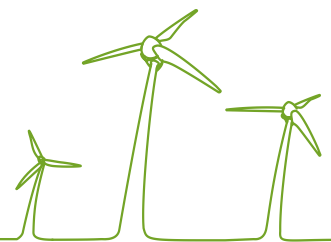


NEOEN RENEWABLES FINLAND OY

Paholammin tuulivoimahanke, Kankaanpää

Melu- ja varjostusmallinnukset



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1 MELU- JA VARJOSTUSMALLINNUKSEN TAVOITTEET

Kankaanpään kaupungin alueelle suunnitteilla olevan Paholammin tuulivoimahankkeen aiheuttamia melu- ja varjostusvaikutuksia on arvioitu laatimalla mallinnukset tuulivoimaloiden aiheuttamista äänenpainetasoista ja varjostuksista. Mallinnusten tavoitteena on osoittaa, kuinka laajalle alueelle kyseiset vaikutukset ulottuvat ja arvioida vaikutukset lähiseudun ympärivuotiselle ja vapaa-ajan asutukselle.

Tuulivoimaloiden aiheuttamia melu- ja varjostusvaikutuksia on mallinnettu WindPro-ohjelmalla voimalapaikkojen alustavien sijoituspaikkojen mukaisesti.

Melumallinnukset on laatinut insinööri (AMK) Johanna Harju. Laaduntarkistuksen on suorittanut insinööri (AMK) Henna-Riikka Rintamäki.

2 LÄHTÖTIEDOT JA MENETELMÄT

2.1 Melu

2.1.1 Melumallinnus ISO 9613-2

Tuulivoimaloiden aiheuttamat äänenpainetasot on mallinnettu WindPRO-laskentaohjelmalla ISO 9613-2 standardin mukaisesti. Ympäristöhallinnon tuulivoimaloiden melun mallintamista koskevan ohjeen 2/2014 mukaisesti tuulen nopeutena käytettiin 8 m/s, ilman lämpötilana 15 °C, ilmanpaineena 101,325 kPa, ilman suhteellisenä kosteutena 70 % ja maanpinnan kovuutena arvoa 0,4. Laskenta on tehty 4,0 m maapinta-tasosta.

Paholammin hankkeen äänenpainetasot on mallinnettu hankevaihtoehdossa 1 käyttäen napakorkeuksiltaan 219 m korkeita voimaloita. Lähtötietona eli referenssivoimalana on käytetty tuulivoimalaitosvalmistaja Vestaksen V162 voimalaa, jonka roottorin halkaisija on 162 m. Hankevaihtoehdossa 1 tuulivoimalaitoksen kokonaiskorkeudeksi muodostuu 300 m. Hankevaihtoehdossa 2 on käytetty napakorkeuksiltaan 169 m korkeita voimaloita. Lähtötietona eli referenssivoimalana on käytetty myös hankevaihtoehdossa 2 tuulivoimalaitosvalmistaja Vestaksen V162 voimalaa, jolloin tuulivoimalaitoksen kokonaiskorkeudeksi muodostuu 250 m.

Napakorkeudessa vallitseva tuulennopeus (kun 10 m korkeudessa tuulennopeus on 8 m/s) on arvioitu ympäristöministeriön ohjeen 4/2014 mukaan. Voimalaitoksen V 162-6000 äänitehotaso (LWA) on 104,3 dB(A). Tämä on tuulivoimalan valmistajan antama takuarvo (Taulukko 1) kun voimalaitoksen siipityyppi on "with serrated trailing edge", eli voimalaitoksen siipien reunaan on asennettu melua vaimentavia sahalaitaelementtejä. Melun leviämismallinnusten tulokset ovat liitteenä 1.

Melumallinnuksessa on huomioitu Paholammin suunniteltujen tuulivoimaloiden lisäksi jo rakennetut Kirkkokallion (9 kpl) ja Kooninkallion (9 kpl) tuulivoimalat. Kirkkokallion tuulivoimalat ovat napakorkeuksiltaan 120 m korkeita N117 voimaloita, joiden roottorin halkaisija on noin 117 metriä. Voimalaitoksen äänitehotasona (LWA) on Kooninkallion osayleiskaavaa varten tehdyn melumallinnuksen (Abboud 2013) tavoin käytetty 105 dB(A) (Taulukko 2).

Kooninkallion tuulivoimalat ovat napakorkeuksiltaan 144 m korkeita N131 STE "with serrated trailing edge" voimaloita, joiden roottorin halkaisija on 131 metriä. Voimalaitoksen N131-3MW lähtömelutaso on 104,5 dB(A). Voimalaitosvalmistajan mukaan N131-3MW melutaso vastaa ylempää luottamusväliä 95 % ja on valmistajan

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mukaan melun takuuarvo, kun siihen lisätään 1,5 dB(A). Näin ollen lähtömelutasona on mallinnuksessa käytetty 106 dB(A) (taulukko 3).

Taulukko 1. Mallinnusohjelma ja tuulivoimaloiden äänitehotasot sekä melun erityispiirteet.

MALLINNUSOHJELMAN TIEDOT							
Mallinnusohjelma ja versio: WindPRO version 3.4.388				Mallinnusmenetelmä: ISO 9613-2			
TUULIVOIMALOIDEN TIEDOT							
Tuulivoimalan valmistaja: Vestas				Tyyppi: V162 STE		Sarjanumero/t:-	
Nimellisteho: 6,0 MW		Napakorkeus:219 m (VE 1) ja 169 m (VE 2)		Roottorin halkaisija:162 m		Tornin tyyppi: teräs	
Mahdollisuudet vaikuttaa tuulivoimalan melupäästöön käytön aikana ja sen vaikutus meluun							
Lapakulman säätö		Pyörimisnopeus		Muu, mikä			
Kyllä	-	dB	Kyllä	-	dB	Noise mode säätö:	-
Ei			Ei			Noise mode, lähtömelutaso	-
AKUSTISET TIEDOT/LASKENNAN LÄHTÖTIEDOT							
Document nro: 0095-3732_00, 2020-09-11							
Voimalaitosvalmistajan mukaan melutaso 104,3 dB(A) on IEC-standardin 61400-11 mukainen takuuarvo.							
Oktaaveittain [Hz],dB(A)		1/3-oktaaveittain [Hz], dB(A)					
31,5	-	12,5	47,9	125	86,8	1250	93,2
63	84,1	16	53,6	160	89	1600	92
125	91,9	20	58,5	200	90,7	2000	90,5
250	96,9	25	63	250	92,1	2500	88,8
500	99,2	31,5	67,4	315	93,2	3150	86,7
1000	98,7	40	71,6	400	94,1	4000	84,1
2000	95,4	50	75,2	500	94,5	5000	81,4
4000	89,4	63	78,6	630	94,7	6300	78,3
8000	80,4	80	81,8	800	94,5	8000	74,8
104,3 dB(A)		100	84,4	1000	94	10000	71,1
Melun erityispiirteiden mittaust ja havainnot:							
Kapeakaistaisuus / Tonaalisuus		Impulssimaisuus		Merkityksellinen sykintä (amplitudimodulaatio)		Muu, Mikä:	
kyllä	ei	kyllä	ei	kyllä	ei	kyllä	ei

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Taulukko 2. Kirkkokallion tuulivoimaloiden äänitehotasot sekä melun erityispiirteet.

TUULIVOIMALOIDEN TIEDOT							
Tuulivoimalan valmistaja: Nordex				Tyyppi: N117		Sarjanumero/t: -	
Nimellisteho: 2,4 MW		Napakorkeus:120 m		Roottorin halkaisija:117 m		Tornin tyyppi: teräs	
Mahdollisuudet vaikuttaa tuulivoimalan melupäästöön käytön aikana ja sen vaikutus meluun							
Lapakulman säätö		Pyörimisnopeus		Muu, mikä			
Kyllä	-	dB	Kyllä	-	dB	Noise mode säätö:	-
Ei			Ei			Noise mode, lähtömelutaso	-
AKUSTISET TIEDOT/LASKENNAN LÄHTÖTIEDOT							
F008_146_A07_EN_R00_N117-2400kW_Third_Octave (A)							
Oktaaveittain [Hz],dB(A)		1/3-oktaaveittain [Hz], dB(A)					
31,5	-	12,5	-	125	86,5	1250	94,7
63	85,3	16	-	160	87	1600	95,7
125	90,9	20	62,5	200	90,6	2000	93,3
250	96,1	25	63	250	90,4	2500	92,7
500	98,1	31,5	67,2	315	92,3	3150	92,3
1000	99,5	40	75,9	400	93,5	4000	90,4
2000	98,9	50	76,6	500	92,3	5000	86,6
4000	95,1	63	80,3	630	93,1	6300	83,5
8000	83,5	80	84,4	800	94,4	8000	76,1
105 dB(A)		100	84	1000	94,8	10000	-
Melun erityispiirteiden mittaustulos ja havainnot:							
Kapeakaistaisuus / Tonaalisuus		Impulssimaisuus		Merkityksellinen sykintä (amplitudimodulaatio)		Muu, Mikä:	
kyllä	ei	kyllä	ei	kyllä	ei	kyllä	ei

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Taulukko 3. Kooninkallion tuulivoimaloiden äänitehotasot sekä melun erityispiirteet.

TUULIVOIMALOIDEN TIEDOT							
Tuulivoimalan valmistaja: Nordex				Tyyppi: N131 STE		Sarjanumero/t: -	
Nimellisteho: 3 MW		Napakorkeus:144 m		Roottorin halkaisija:131 m		Tornin tyyppi: teräs	
Mahdollisuudet vaikuttaa tuulivoimalan melupäästöön käytön aikana ja sen vaikutus meluun							
Lapakulman säätö		Pyörimisnopeus		Muu, mikä			
Kyllä	-	dB	Kyllä	-	dB	Noise mode säätö:	-
Ei			Ei			Noise mode, lähtömelutaso	-
AKUSTISET TIEDOT/LASKENNAN LÄHTÖTIEDOT							
Document nro: F008_246_A07_EN_R01_N131-3000kW_Third_Octave							
Valmistajan ilmoittama tuulivoimalan tuottama äänitehotaso vastaa keskiäänitasoa ja lisäämällä epävarmuus 1,5 dB(A) saadaan äänitehotaso vastaamaan takuuarvoa.							
Oktaaveittain [Hz],dB(A)		1/3-oktaaveittain [Hz], dB(A)					
31,5	-	12,5	-	125	86,2	1250	96,2
63	84,4	16	-	160	88	1600	96,3
125	91,5	20	59,3	200	90	2000	94,4
250	96,3	25	65	250	91,2	2500	93,8
500	97,9	31,5	67,8	315	92,9	3150	93,4
1000	100,8	40	73	400	92,2	4000	93
2000	99,7	50	76,5	500	92,9	5000	90,8
4000	97,3	63	81,3	630	94	6300	86,1
8000	87,2	80	85,5	800	95,7	8000	80,1
106 dB(A)		100	86,2	1000	96,3	10000	70,1
Melun erityispiirteiden mittaus ja havainnot:							
Kapeakaistaisuus / Tonaalisuus		Impulssimaisuus		Merkityksellinen sykintä (amplitudimodulaatio)		Muu, Mikä:	
kyllä	ei	kyllä	ei	kyllä	ei	kyllä	ei

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Taulukko 4. Käytetyt mallinnusparametrit ISO 9613-2 laskelmissa

AKUSTISET TIEDOT/LASKENNAN LÄHTÖTIEDOT			
Laskenta korkeus		Laskentaruudun koko [m x m]	
ISO 9613-2: 4,0 m		25x25 m	
Suhteellinen kosteus		Lämpötila	
70 %	Muu, mikä ja miksi:	ISO 9613-2: 15 C°	
Maastomallin lähde ja tarkkuus			
Maastomallin lähde: MML maastotietokanta		Vaakaresoluutio:1,0	Pystyresoluutio:0,5
Maan- ja vedenpinnan absorptioon ja heijastuksen huomioiminen, käytetyt kertoimet			
ISO 9613-2	0,4		HUOM
Ilmakehän stabiilius laskennassa/meteorologinen korjaus			
Neutraali, (0): Neutraali		Muu, mikä ja miksi:	
Sääolosuhteiden huomiointi; laskennassa käytetty tuulen suunnat ja nopeus			
Tuulen suunta: 0-360°		Tuulennopeus: 10 metrin korkeudella mitattuna 8 m/s	
Voimalan äänen suuntaavuus ja vaimentuminen			
Vapaa avaruus: kyllä		Muu, mikä, miksi:	

2.1.2 Matalataajuisen melun mallinnus

Matalataajuinen melu laskettiin Ympäristöministeriön ohjeen 2/2014 mukaisin menetelmin, käyttäen voimalavalmistajilta saatuja arvioita voimaloiden äänitehotasoista. Ohje 2/2014 antaa menetelmän matalataajuisen melun laskentaan rakennusten ulkopuolelle. Sosiaali- ja terveysministeriön Asumisterveysasetus 2015 antaa matalataajuiselle melulle toimenpiderajat asuinhuoneissa. Rakennusten sisälle kantautuva äänitaso arvioitiin Turun AMK:n (Keränen, Hakala ja Hongisto, 2018) julkistamien Anojanssi- projektin tulosten mukaisten ääneneristävyysarvojen ja tuloksia verrattiin toimenpiderajoihin.

Taulukko 5. Suomalaisen pientalon julkisivun äänitasoeron alalikiarvo Anojanssi projektin tulosten mukaisesti.

f [Hz]	20	25	31.5	40	50	63	80	100	125	160	200
DLo [dB]	7.6	8.3	9.2	10.3	11.5	13.0	14.8	16.8	18.8	21.1	22.8

Matalataajuisen melun laskelmassa huomioitiin maanpinnan muodon vaikutus ohjeen 4/2014 mukaisesti. Tulokset on esitetty taajuuskohtaisena taulukkona hankealuetta ympäröiville taloille. Kohdekohtaiset tulokset on liitetty raporttiin (Liite 2).

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2.2 Varjostusmallinnus

Tuulivoimaloiden varjostusvaikutukset mallinnettiin WindPRO-ohjelman Shadow-moduulilla. Laskennassa varjot huomioidaan, kun aurinko on yli 3 astetta horisontin yläpuolella. Varjoksi lasketaan tilanne, jossa siipi peittää vähintään 20 % auringosta. Varjostuksen tarkastelukorkeutena lähialueen asuin- tai lomarakennusten pihapiirissä käytettiin 1,0 metriä ja laskenta-alueen kokoa 5,0 x 5,0 metriä. Laskentaikkunoiden suunnat asennettiin voimaloita kohti ns. "greenhouse mode".

Mallinnus tehtiin niin sanotulle todelliselle tilanteelle (real case). Mallinnus tehtiin kahdelle eri laskentatilanteelle:

- 1) Todellinen tilanne, jossa puuston suojaavaa vaikutusta ei huomioitu (real case, no forest)
- 2) Todellinen tilanne, jossa puuston suojaavaa vaikutusta on huomioitu (real case, forest). Puuston korkeustiedot perustuvat Luonnonvarakeskus (Luke) vuoden 2019 monilähteiseen valtakunnan metsien inventointiin (MVMi), jossa käytetään valtakunnan metsien inventoinnin (VMI) maastomittausten lisäksi satelliittikuvia ja muita tietolähteitä, kuten Maan-mittauslaitoksen numeerista maastotietokantaa ja korkeusmallia. Vuoden 2019 metsävara-kartoissa karttateemojen maastoelementin koko on 16 x 16 metriä.

Paholammin hankkeen aiheuttaman varjostuksen laskennassa on huomioitu hankealueen korkeustiedot, tuulivoimaloiden sijainnit, tuulivoimalatyyppi, napakorkeus ja roottorin halkaisija sekä hankealueen aikavyöhyke. Mallinnuksessa otettiin huomioon auringon asema horisontissa eri kellon- ja vuodenaikoina, pilvisuus kuukausittain eli kuinka paljon aurinko paistaa ollessaan horisontin yläpuolella sekä tuulivoimalaitosten arvioitu vuotuinen käyntiaika.

Varjostusmallinnuksessa käytettiin lähtötietona eli referenssivoimalana tuulivoimalaitosvalmistaja Vestas V162- 6.0 voimalaa, jonka roottorin halkaisija on 162 m. Hankevaihtoehdossa 1 käytettiin napakorkeutta 219 m (kokonaiskorkeus 300 m) ja hankevaihtoehto 2:ssa 169 m (kokonaiskorkeus 250 m). Myös varjostusmallinnuksessa on huomioitu Paholammin suunniteltujen tuulivoimaloiden lisäksi Kirkkokallion ja Kooninkallion tuotannossa olevat tuulivoimalat.

Auringon keskimääräiset paistetunnit perustuvat Ilmatieteenlaitoksen Seinäjoen (Pelmaa) sääaseman pitkäaikaisiin mitattuihin sää tietoihin 1981–2010. Laskentojen tuulen suunta- ja nopeusjakamana käytettiin Merra-tietoa hankealueen läheisyydestä (E22,500 N62,000). Varjostusmallinnuksen tuloksia on havainnollistettu kartan avulla. Kartalla esitetään varjostusvaikutuksen (1, 8 ja 20 tuntia vuodessa) laajuus. Sen lisäksi mallinnuksessa on erikseen laskettu vaikutus tuulivoimapuistoalueen ympäristössä oleviin herkkiin kohteisiin. Tulokset on esitetty liitteessä 3.

2.3 Raja- ja ohjearvot

Valtioneuvoston asetuksessa (1107/2015) tuulivoimaloille on määritelty ohjearvot päivä- ja yöajan keskiäänitasojen maksimiarvolle. Asetus tuli voimaan 1.9.2015. Mikäli tuulivoimalan melu sisältää tonaalisia, kapeakaistaisia tai impulssimaisia komponentteja, tai se on selvästi amplitudimoduloitunutta, mallinnustuloksiin tulee ohjeen mukaan lisätä viisi desibeliä ennen ohjearvoon vertaamista. Koska ohjearvo sisältää jo tyypillisen tuulivoimamelun piirteet, edellä mainitut äänenpiirteiden tulee olla tuulivoimalalle epätyypillisen voimakkaita, jotta mallinnustuloksissa täytyy huomioida viiden desibelin lisä äänenvoimakkuuteen.

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Taulukko 6. Valtioneuvoston asetuksen mukaiset tuulivoimaloiden melutason ohjearvot (Valtioneuvoston asetus 1107/2015).

Vaikutuskohde	Päivä (7-22)	Yö (22-7)
Pysyvä asutus	45 dB	40 dB
Loma-asutus	45 dB	40 dB
Hoitolaitokset	45 dB	40 dB
Oppilaitokset	45 dB	—
Virkistysalueet	45 dB	—
Leirintäalueet	45 dB	40 dB
Kansallispuistot	40 dB	40 dB

Sosiaali- ja terveysministeriön asetuksessa (545/2015) on annettu matalataajuiselle melulle toimenpiderajat. Asetus tuli voimaan 15.5.2015. Toimenpiderajat koskevat asuinhuoneita ja ne on annettu taajuuspainottamattomina yhden tunnin keskiäänitasoina tersseittäin. Toimenpiderajat koskevat yöaikaa ja päivällä sallitaan 5 dB suuremmat arvot.

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Taulukko 7. Matalataajuisen sisämelun tunnin keskiäänitason toimenpiderajat nukkumiseen tarkoitetuissa tiloissa.

Terssikaista Hz	20	25	31,5	40	50	63	80	100	125	160	200
Keskiäänitaso L _{Zeq} ,1h, dB	74	64	56	49	44	42	40	38	36	34	32
Edellisestä laskettu keskiäänitaso A-painotettuna LA _{eq} ,1h, dB	24	19	17	14	14	16	18	19	20	21	21

Lisäksi yöaikainen mahdollisesti unihäiriötä aiheuttava melu, joka erottuu selvästi taustamelusta, ei saa ylittää 25 dB yhden tunnin keskiäänitasona LA_{eq},1h mitattuna niissä tiloissa, jotka on tarkoitettu nukkumiseen.

Suomessa ei ole viranomaisten antamia yleisiä määräyksiä tuulivoimaloiden muodostaman varjostuksen enimmäiskestoista eikä varjonmuodostuksen arviointiperusteista. Ympäristöministeriön tuulivoimarakentamisen suunnitteluohjeistuksessa esitetään käytettäväksi muiden maiden suosituksia välkkeen rajoittamisesta (Ympäristöministeriö 2012).

Useissa maissa on annettu raja-arvoja tai suosituksia hyväksyttävän välkevaikutuksen määrästä. Esimerkiksi Ruotsissa suositus on kahdeksan tuntia vuodessa ja 30 minuuttia päivässä.

Arvioinnissa on tarkasteltu vaikutuksia alueella, jossa varjoja tai välkettä mallinnuksen mukaisessa todellisessa tilanteessa ("real case") esiintyy yli tunti vuodessa.

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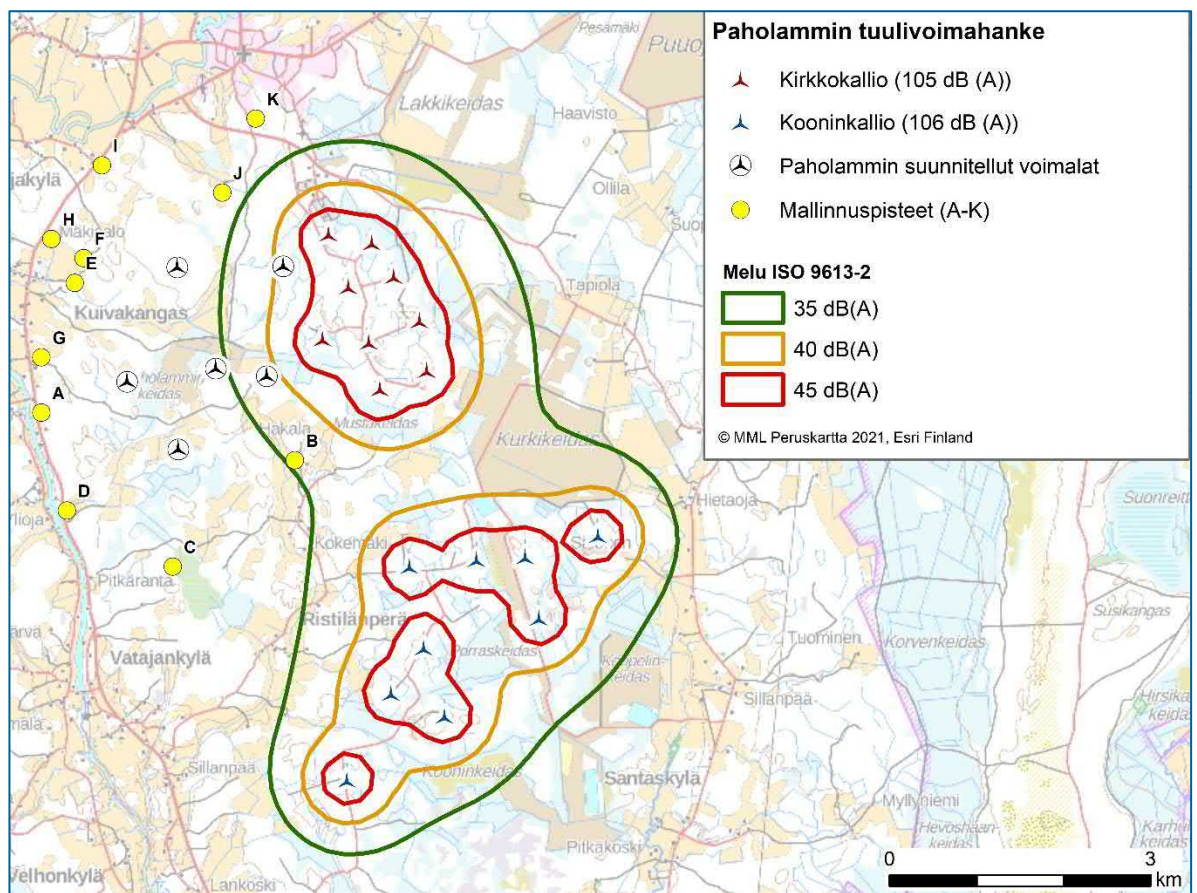
3 MELU- JA VARJOSTUSMALLINNUSTEN TULOKSET

3.1 Melun laskentatulokset ISO 9613-2

3.1.1 Nykytilanne

Paholammin suunnitellun tuulivoimapuiston itäpuolella sijaitsee tuotannossa oleva Kirkkokallion tuulivoimapuisto ja kaakkoispuolella tuotannossa oleva Kooninkallion tuulivoimapuisto. Näiden tuulivoimapuistojen aiheuttama melu on esitetty alla olevassa kuvassa (Kuva 1) ja Paholammin mallinnuspisteiden a-k nykytilanteen melutasot taulukossa 8. Nykytilan melumallinnuksen tarkemmat laskentatulokset löytyvät liitteestä 1.

Lisäksi lähistöllä on useita turvetuotantoalueita joiden toiminnasta aiheutuu turpeen tuotantokaudella jonkin verran melua.



Kuva 1. Laskennalliset Kirkkokallion ja Kooninkallion tuulivoimatuotannosta aiheutuvat melutasot Paholammin läheisyydessä nykytilanteessa standardin ISO 9613-2 mukaisesti.

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Taulukko 8. Laskennalliset tuulivoimatuotannosta aiheutuvat melutasot Paholammin ympäristössä nykytilanteessa standardin ISO 9613-2 mukaisesti.

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskenta- korkeus (m)	Melutaso db (A)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	4,0	25
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	4,0	35,5
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	4,0	28,4
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	4,0	25,2
Asuinrakennus E, Välisalontie 130	250 125	6 879 799	95	4,0	26,4
Asuinrakennus F, Välisalontie 101	250 226	6 880 083	97,6	4,0	26,6
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	4,0	25,2
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	4,0	25,1
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	4,0	26
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	4,0	32,9
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	4,0	30,8

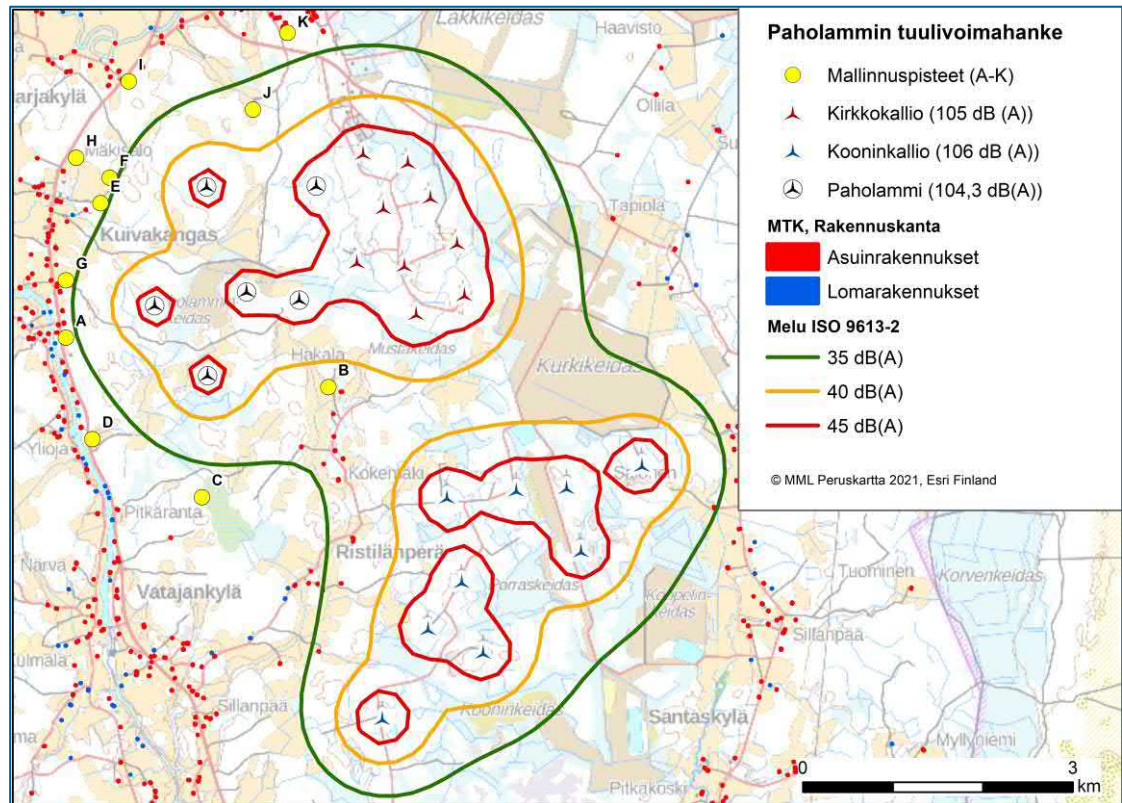
3.1.2 Hankevaihtoehto 1; Paholammi 6 x V162 x HH219 m

Hankevaihtoehdossa 1 Paholammin hankkeen lähimpien asuin- ja lomarakennusten pihapiirissä melutasot alittavat laskelmien mukaan 40 dB. Paholammin tuulivoimapuiston aiheuttamat melutasot hankevaihtoehdossa 1 on esitetty kuvassa 2 ja mallinnuspisteiden a-k melutasot taulukossa 9.

Mallinnuksessa on huomioitu myös jo tuotannossa olevat Kirkkokallion ja Kooninkallion tuulivoimapuistot.

Melumallinnuksen tarkemmat laskentatulokset löytyvät liitteestä 1.

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Kuva 2. Laskennalliset tuulivoimatuotannosta aiheutuvat melutasot Paholammin läheisyydessä hankevaihtoehdossa 1 (kokonaiskorkeus 300 m) standardin ISO 9613-2 mukaisesti.

Taulukko 9. Laskennalliset tuulivoimatuotannosta aiheutuvat melutasot Paholammin ympäristössä hankevaihtoehdossa 1 standardin ISO 9613-2 mukaisesti.

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskenta-korkeus (m)	Melutaso db (A)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	4,0	34,0
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	4,0	38,3
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	4,0	32,8
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	4,0	32,0
Asuinrakennus E, Välisalontie 130	250 125	6 879 799	95	4,0	34,4
Asuinrakennus F, Välisalontie 101	250 226	6 880 083	97,6	4,0	34,4
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	4,0	34,2
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	4,0	31,8
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	4,0	31,5
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	4,0	37,1
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	4,0	33,1

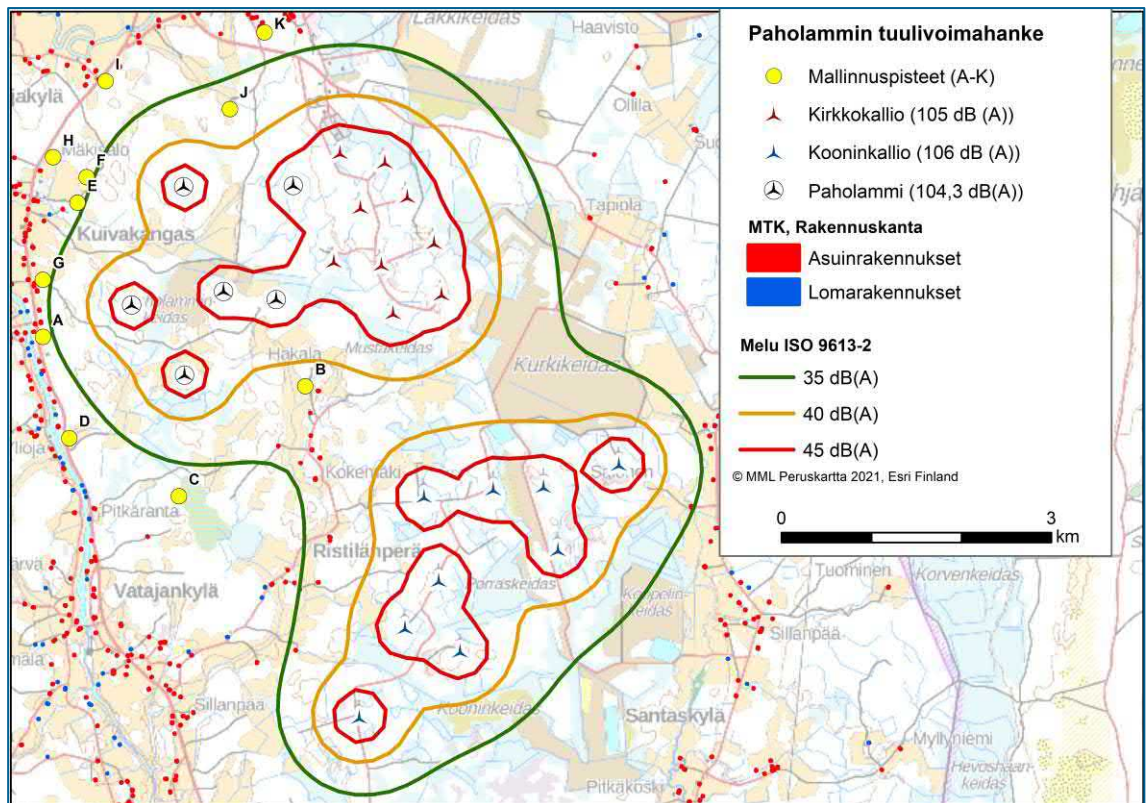
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3.1.3 Hankevaihtoehto 2; Paholammi 6 x V162 x HH169 m

Hankevaihtoehdossa 2 Paholammin hankkeen lähimpien asuin- ja lomarakennusten pihapiirissä melutasot alittavat laskelmien mukaan 40 dB. Paholammin tuulivoimapuiston aiheuttamat melutasot hankevaihtoehdossa 2 on esitetty kuvassa 3 ja mallinnuspisteiden a-k melutasot taulukossa 10.

Mallinnuksessa on huomioitu myös jo tuotannossa olevat Kirkkokallion ja Kooninkallion tuulivoimapuistot.

Melumallinnuksen tarkemmat laskentatulokset löytyvät liitteestä 1.



Kuva 3. Laskennalliset tuulivoimatuotannosta aiheutuvat melutasot Paholammin läheisyydessä hankevaihtoehdossa 2 (kokonaiskorkeus 250 m) standardin ISO 9613-2 mukaisesti

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Taulukko 10. Laskennalliset tuulivoimatuotannosta aiheutuvat melutasot Paholammin ympäristössä hankevaihtoehdossa 2 standardin ISO 9613-2 mukaisesti.

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskenta- korkeus (m)	Melutaso db (A)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	4,0	34,1
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	4,0	38,3
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	4,0	32,8
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	4,0	32,1
Asuinrakennus E, Väლისalontie 130	250 125	6 879 799	95	4,0	34,5
Asuinrakennus F, Väლისalontie 101	250 226	6 880 083	97,6	4,0	34,4
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	4,0	34,2
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	4,0	31,8
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	4,0	31,5
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	4,0	37,1
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	4,0	33,1

3.2 Matalataajuiset melutasot

Sisätilojen laskennallisia tuloksia on verrattu Sosiaali- ja terveysministeriön (STM) Asumisterveysasetuksessa (545/2015) annettuihin sisämelun toimenpiderajoihin. Nämä ovat enimmäisarvoja, jotka on laadittu yöaikaiselle melulle nukkumiseen tarkoitettuihin tiloihin. Toimenpiderajaa on verrattu myös äänitasoon tarkasteltujen rakennusten ulkopuolella.

Mallinnuksen mukaan Paholammin tuulivoimahankkeen matalataajuinen melu ei kummassakaan hankevaihtoehdossa ylitä Sosiaali- ja terveysministeriön asumisterveysohjearvoa laskentapisteen sisätiloissa. Taulukoissa 9 ja 10 näkyy toimenpiderajan alitus (negatiivinen arvo) tai ylitys (positiivinen arvo). Myös tuotannossa olevien Kirkkokallion ja Kooninkallion tuulivoimapuistojen aiheuttama matalataajuinen melu on huomioitu mallinnuksissa.

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Taulukko11. Paholammin hankevaihtoehdon 1 matalataajuisen melun mallinnustulokset herkissä kohteissa verrattuna Sosiaali- ja terveysministeriön toimenpiderajaan.

Rakennus	Äänitaso ulkona		Äänitaso sisällä	
	L eq,1h – Asumisterveys- asetus sisällä	Hz	L eq,1h – Asumisterveys- asetus sisällä	Hz
Asuinrakennus A, Kankaanpääntie 534	2,1	80	-11,7	50
Asuinrakennus B, Ristiläntie 459	6,9	80	-7,5	50
Lomarakennus C, Variksentie 93	2,8	80	-11,5	50
Asuinrakennus D, Kankaanpääntie 646	1,5	80	-12,5	50
Asuinrakennus E, Välisälontie 130	2,6	80	-11,2	50
Asuinrakennus F, Välisälontie 101	2,6	80	-11,2	50
Asuinrakennus G, Kankaanpääntie 468	2,2	80	-11,6	50
Lomarakennus H, Kankaanpääntie 320	1,1	80	-12,7	50
Asuinrakennus I, Kankaanpääntie 218	1,1	80	-12,8	50
Asuinrakennus J, Penkkinevantie 85	5,1	80	-8,9	50
Asuinrakennus K, Seppäkoskentie 36	2,9	80	-11,3	50

Taulukko 12. Paholammin hankevaihtoehdon 2 matalataajuisen melun mallinnustulokset herkissä kohteissa verrattuna Sosiaali- ja terveysministeriön toimenpiderajaan.

Rakennus	Äänitaso ulkona		Äänitaso sisällä	
	L eq,1h – Asumisterveys- asetus sisällä	Hz	L eq,1h – Asumisterveys- asetus sisällä	Hz
Asuinrakennus A, Kankaanpääntie 534	2,2	80	-11,7	50
Asuinrakennus B, Ristiläntie 459	6,9	80	-7,5	50
Lomarakennus C, Variksentie 93	2,9	80	-11,5	50
Asuinrakennus D, Kankaanpääntie 646	1,5	80	-12,5	50
Asuinrakennus E, Välisälontie 130	2,7	80	-11,2	50
Asuinrakennus F, Välisälontie 101	2,6	80	-11,2	50
Asuinrakennus G, Kankaanpääntie 468	2,2	80	-11,5	50
Lomarakennus H, Kankaanpääntie 320	1,1	80	-12,7	50
Asuinrakennus I, Kankaanpääntie 218	1,1	80	-12,8	50
Asuinrakennus J, Penkkinevantie 85	5,1	80	-8,9	50
Asuinrakennus K, Seppäkoskentie 36	2,9	80	-11,2	50

Rakennuskohtaiset matalataajuiset äänitasot lähimpien rakennusten osalta on esitetty liitteessä 2. Rakennusten kirjaintunnukset ovat samat kuin ISO 9613-2 mallinnuksessa (Liite 1).

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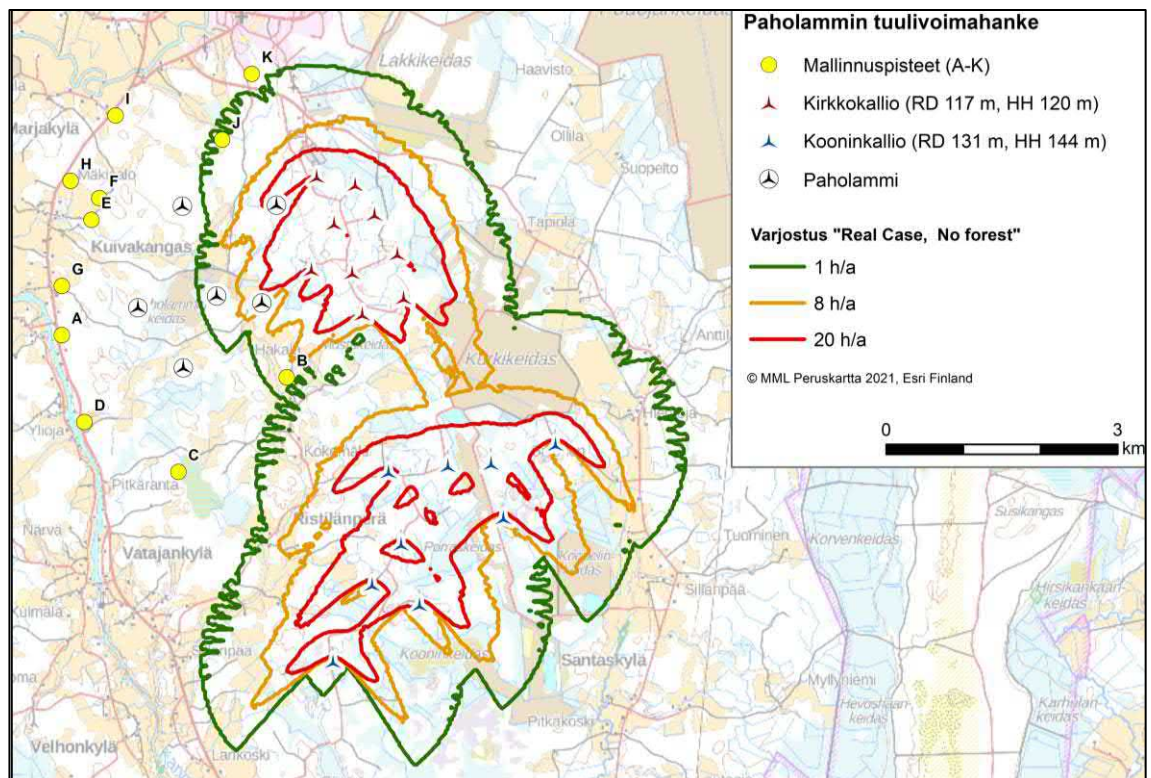
3.3 Varjostusmallinnusten tulokset

3.3.1 Nykytilanne

Nykytilanteessa alueelle aiheutuu varjostusta tuotannosta olevista Kirkkokallion ja Kooninkallion tuulivoimaloista. Näiden tuulivoimapuistojen aiheuttama varjostus on esitetty alla olevassa kuvassa (Kuva 4) ja Paholammin mallinnuspisteiden a-k nykytilanteen varjostustunnit taulukossa 13.

Ilman puuston suojaavaa vaikutusta yli 8 tunnin vuotuisen välkevaikutuksen alueelle sijoittuu Paholammin läheisyydessä (enintään 3 km etäisyydellä lähimmästä voimalasta) kaksi asuinrakennusta. Rakennukset sijoittuvat Kooninkallion tuulivoimaloiden länsipuolelle, Ristilänperän alueelle.

Nykytilan varjostusmallinnuksen tarkemmat laskentatulokset löytyvät liitteestä 3.



Kuva 4. Laskennalliset varjostusmallinnuksen tulokset nykytilanteessa. Mallinnus on tehty todellisen tilanteen mukaan ilman puuston suojavaikutusta.

21.12.2021

Taulukko 13. Nykytilanteen laskennalliset varjostustunnit vuodessa lähialueen laskentapisteissä, kun puuston suojaavaa vaikutusta ei huomioida

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskentaikkuna (m)	Varjostus (h/a)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	5x5	0:00
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	5x5	4:19
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	5x5	0:00
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	5x5	0:00
Asuinrakennus E, Väliälöntie 130	250 125	6 879 799	95	5x5	0:00
Asuinrakennus F, Väliälöntie 101	250 226	6 880 083	97,6	5x5	0:00
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	5x5	0:00
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	5x5	0:00
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	5x5	0:00
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	5x5	1:19
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	5x5	0:00

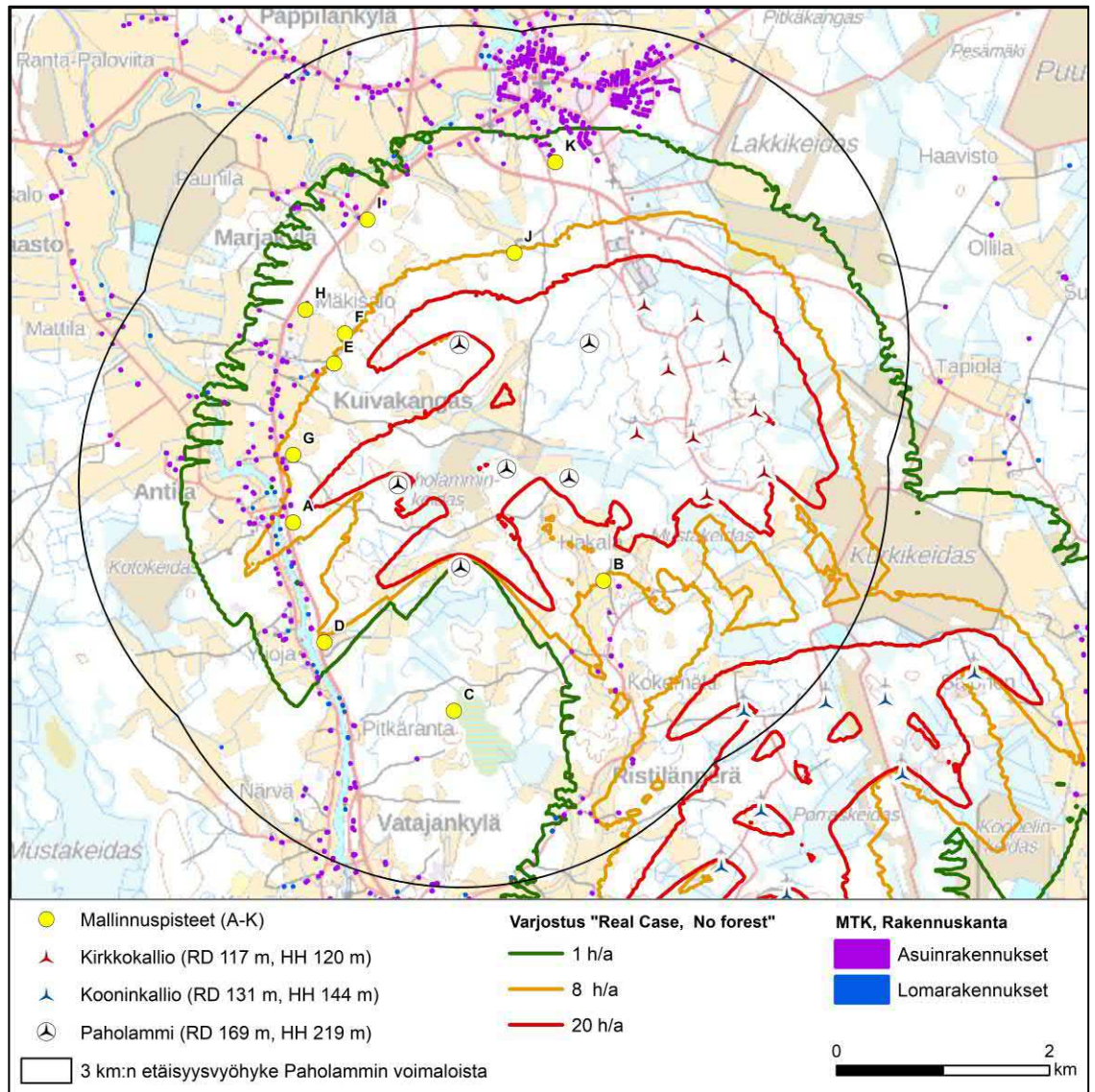
3.3.2 Hankevaihtoehto 1; Paholammi 6 x V162 x HH219 m

Ilman puuston suojaavaa vaikutusta yli 8 tunnin vuotuisen välkevaikutuksen alueelle sijoittuu Paholammin läheisyydessä (enintään 3 km etäisyydellä lähimmästä voimalasta) kaikkiaan 17 asuin- ja kolme loma-ajan rakennusta. Aiheutuvat varjostustunnit on esitetty kuvassa 5 ja Paholammin mallinnuspisteiden a-k varjostustunnit taulukossa 14.

Mallinnuksessa on huomioitu myös jo tuotannossa olevat Kirkkokallion ja Kooninkallion tuulivoimapaistot.

Tarkemmat tulokset varjostusmallinnuksesta "Real Case, No forest" on esitetty liitteessä 3.

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Kuva 5. Laskennalliset varjostusmallinnuksen tulokset hankevaihtoehdossa 1, kun puuston suojaavaa vaikutusta ei huomioida

21.12.2021

Taulukko 14. Hankevaihtoehdon 1 laskennalliset varjostustunnit vuodessa lähialueen laskentapisteissä, kun puuston suojaava vaikutusta ei huomioida

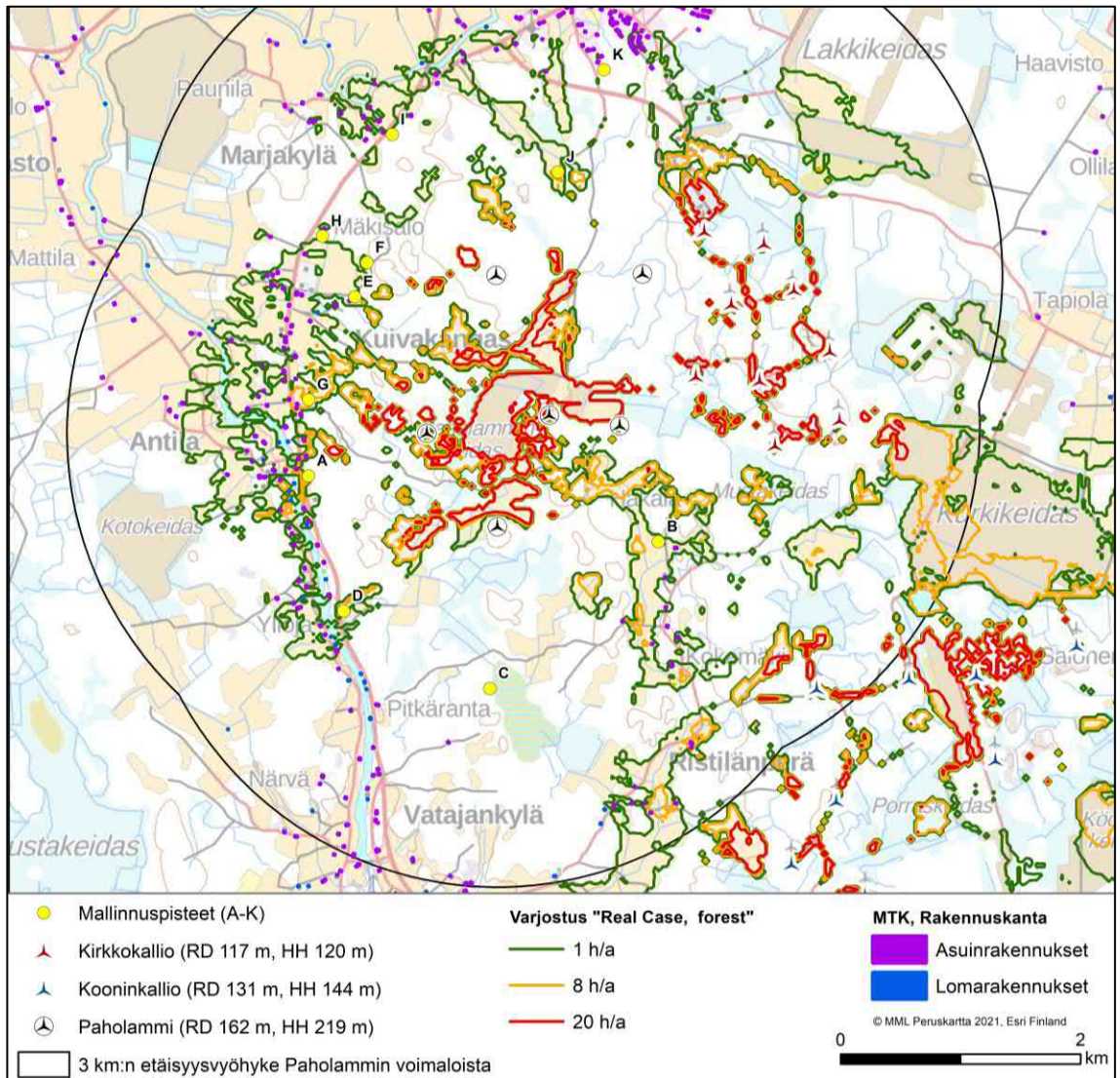
Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskentapiste (m)	Varjostus (h/a)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	5x5	14:49
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	5x5	7:35
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	5x5	0:00
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	5x5	7:22
Asuinrakennus E, Välisälontie 130	250 125	6 879 799	95	5x5	9:33
Asuinrakennus F, Välisälontie 101	250 226	6 880 083	97,6	5x5	8:10
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	5x5	12:20
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	5x5	3:30
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	5x5	2:04
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	5x5	10:37
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	5x5	2:36

Mallinnus "Real Case, No Forests" ei ota huomioon puustosta aiheutuvia katvevaikutuksia, joten vaikutukset jäävät todellisuudessa edellä esitettyä vähäisemmiksi. Kuvassa 6 on esitetty varjostusvaikutus tilanteessa, jossa puuston aiheuttama katvevaikutus on huomioitu. Taulukossa 115 on esitetty mallinnuspisteiden a-k vuotuiset varjostustunnit, kun puuston katvevaikutus huomioidaan.

Huomioitaessa puuston suojaava vaikutus, aiheutuu hankevaihtoehdosta 1 >8h/a välkevaikutuksia kaikkiaan yhdeksän asuinrakennuksen kohdalla.

Tarkemmat tulokset varjostusmallinnuksesta "Real Case, Forest" on esitetty liitteessä 4.

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Kuva 6. Varjostusmallinnuksen tulos hankevaihtoehdossa 1, kun puuston suojaava vaikutus on huomioitu.

21.12.2021

Taulukko 15. Hankevaihtoehdon 1 laskennalliset varjostustunnit vuodessa lähialueen laskentapisteissä, kun puuston suojaavaa vaikutus huomioidaan

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskentakokona (m)	Varjostus (h/a)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	5x5	13:04
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	5x5	3:16
Lomarakennus C, Variksantie 93	251 251	6 876 536	93,1	5x5	0:00
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	5x5	0:00
Asuinrakennus E, Välisalongtie 130	250 125	6 879 799	95	5x5	9:33
Asuinrakennus F, Välisalongtie 101	250 226	6 880 083	97,6	5x5	1:49
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	5x5	12:20
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	5x5	0:00
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	5x5	0:00
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	5x5	9:16
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	5x5	0:00

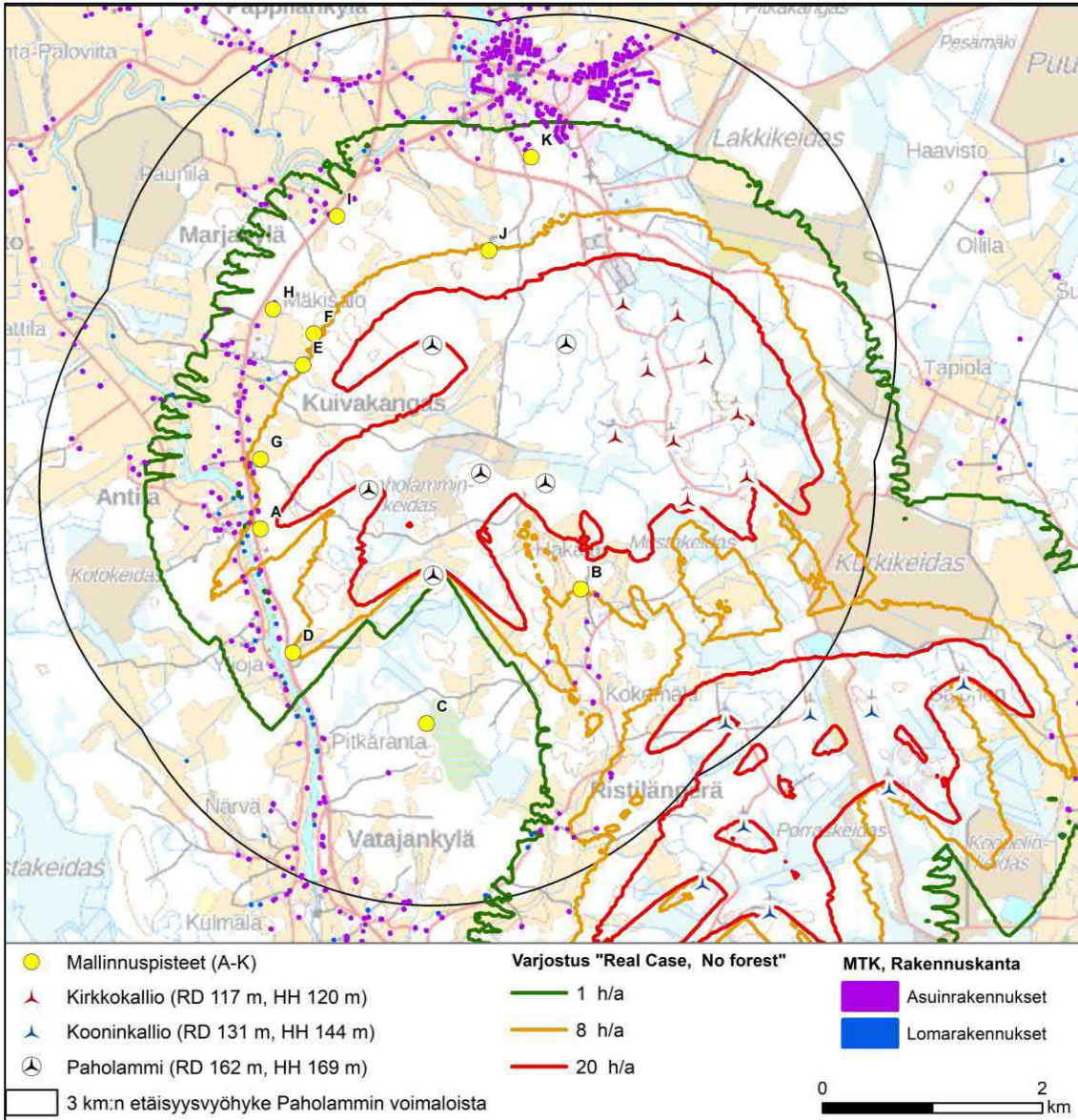
3.3.3 Hankevaihtoehdo 2; Paholammi 6 x V162 x HH169 m

Ilman puuston suojaavaa vaikutusta yli 8 tunnin vuotuisen välkevaikutuksen alueelle sijoittuu Paholammin läheisyydessä (enintään 3 km etäisyydellä lähimmästä voimalasta) 16 asuin- ja kolme loma-ajan rakennusta. Aiheutuvat varjostustunnit on esitetty alla olevassa kuvassa (Kuva 7) ja Paholammin mallinnuspisteiden a-k varjostustunnit taulukossa 16.

Mallinnuksessa on huomioitu tuotannossa olevat Kirkkokallion ja Kooninkallion tuulivoimapaistot.

Tarkemmat tulokset varjostusmallinnuksesta "Real Case, Forest" on esitetty liitteessä 4.

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Kuva 7. Laskennalliset varjostusmallinnuksen tulokset hankevaihtoehdossa 2 kun puuston suojaavaa vaikutusta ei huomioida

21.12.2021

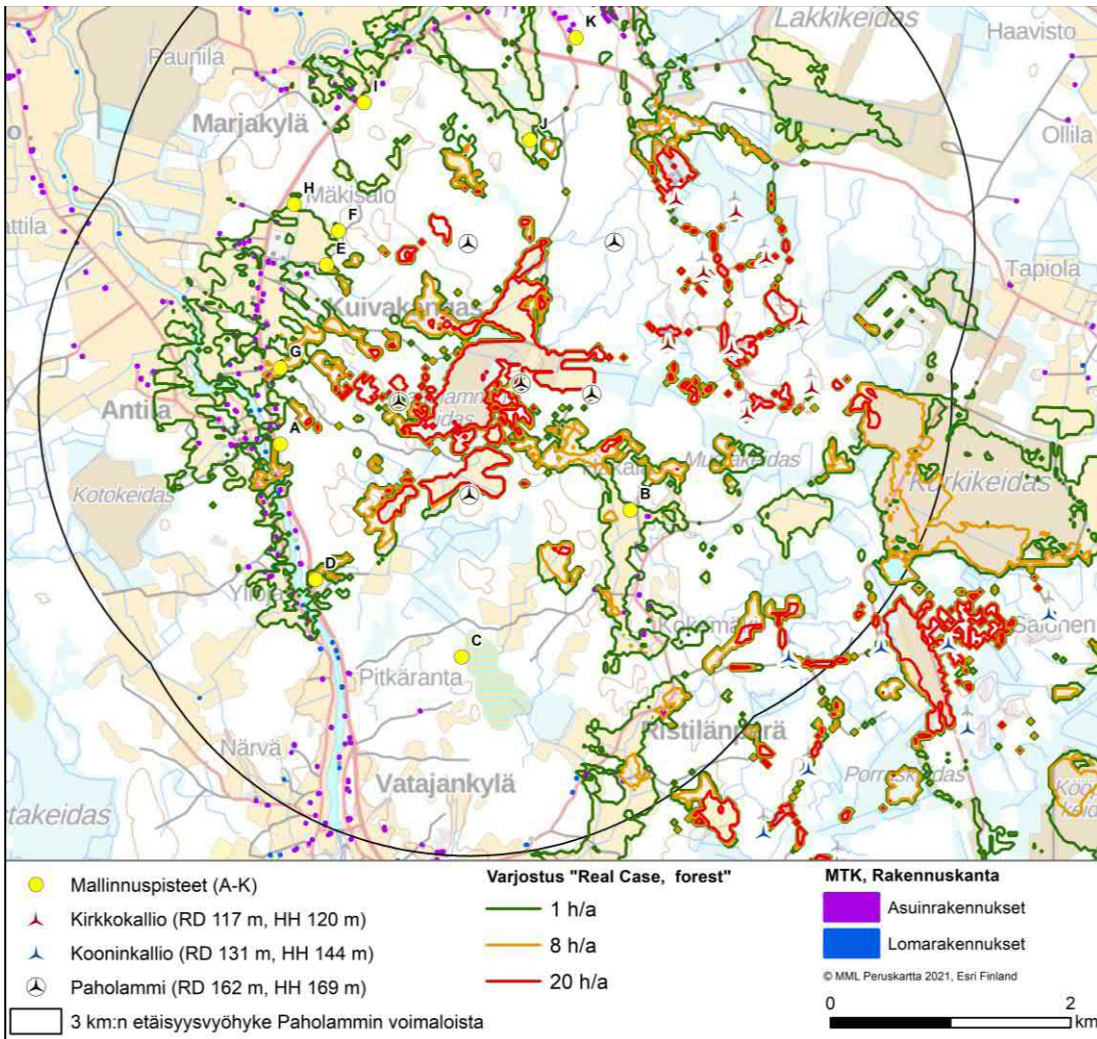
Taulukko 16. Hankevaihtoehdon 2 laskennalliset varjostustunnit vuodessa lähialueen laskentapisteissä, kun puuston suojaavaa vaikutusta ei huomioida

Laskentapiste	ETRS89- TM35 Itä	ETRS89- TM35 Pohjoinen	Z (m)	Laskenta- ikkuna (m)	Varjostus (h/a)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	5x5	14:41
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	5x5	9:45
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	5x5	0:00
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	5x5	8:38
Asuinrakennus E, Välisälontie 130	250 125	6 879 799	95	5x5	8:53
Asuinrakennus F, Välisälontie 101	250 226	6 880 083	97,6	5x5	7:59
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	5x5	12:49
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	5x5	3:21
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	5x5	2:06
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	5x5	10:25
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	5x5	3:07

Kuvassa 8 on esitetty hankevaihtoehdosta 2 aiheutuva varjostusvaikutus tilanteessa, jossa puuston aiheuttama katvevaikutus on huomioitu. Taulukossa 17 on esitetty mallinnuspisteiden a-k vuotuiset varjostustunnit, kun puuston katvevaikutus huomioidaan.

Huomioitaessa puuston suojaava vaikutus, aiheutuu hankevaihtoehdosta 2 > 8 h/a välkevaikutuksia Paholammin läheisyydessä kaikkiaan viiden asuinrakennuksen kohdalla.

21.12.2021



Kuva 8. Varjostusmallinnuksen tulos hankevaihtoehdossa 2, kun puuston suojaava vaikutus on huomioitu.

21.12.2021

Taulukko 17. Hankevaihtoehdon 2 laskennalliset varjostustunnit vuodessa lähialueen laskentapisteissä, kun puuston suojaava vaikutus huomioidaan

Laskentapiste	ETRS89-TM35 Itä	ETRS89-TM35 Pohjoinen	Z (m)	Laskentapikkuna (m)	Varjostus (h/a)
Asuinrakennus A, Kankaanpääntie 534	249 740	6 878 307	92,4	5x5	0:00
Asuinrakennus B, Ristiläntie 459	252 656	6 877 758	100	5x5	5:26
Lomarakennus C, Variksentie 93	251 251	6 876 536	93,1	5x5	0:00
Asuinrakennus D, Kankaanpääntie 646	250 034	6 877 181	87,7	5x5	0:00
Asuinrakennus E, Välsälöntie 130	250 125	6 879 799	95	5x5	8:53
Asuinrakennus F, Välsälöntie 101	250 226	6 880 083	97,6	5x5	1:57
Asuinrakennus G, Kankaanpääntie 468	249 740	6 878 942	94,8	5x5	12:49
Lomarakennus H, Kankaanpääntie 320	249 856	6 880 304	95	5x5	0:00
Asuinrakennus I, Kankaanpääntie 218	250 438	6 881 151	96,3	5x5	0:00
Asuinrakennus J, Penkkinevantie 85	251 819	6 880 838	102,5	5x5	9:03
Asuinrakennus K, Seppäkoskentie 36	252 204	6 881 690	105	5x5	0:00

FCG Suunnittelu ja tekniikka Oy


Johanna Harju
Laatija



Henna-Riikka
Rintamäki
2021.12.21 10:11:32
+02'00'

Henna-Riikka Rintamäki
Laaduntarkistus/Hyväksyjä

21.12.2021

Liite 1: Melun leviämismallinnuksen tulokset ISO 9613-2

Project:

Paholammi / Neoen

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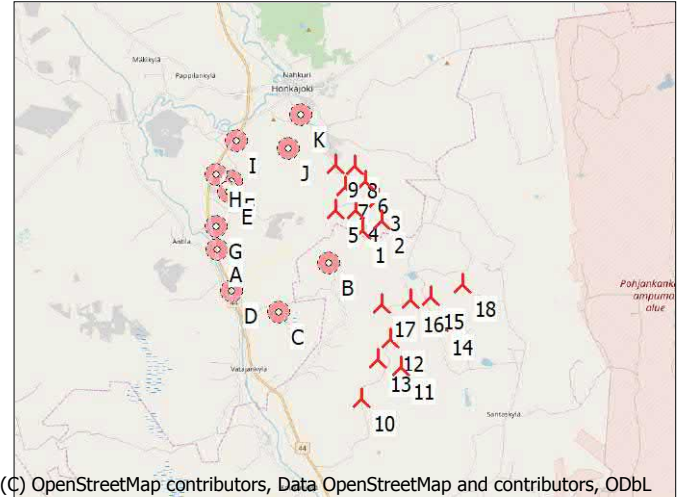
20.10.2021 15.24/3.4.388

DECIBEL - Main Result

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014" from the Ministry of the Environment of Finland

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:200 000

New WTG

Noise sensitive area

WTGs

	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data		Wind speed [m/s]	LwA,ref [dB(A)]
					Valid	Manufact.	Type-generator				Creator	Name		
1	253 616	6 878 546	105,0	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
2	254 154	6 878 757	112,2	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
3	254 073	6 879 329	112,5	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
4	253 487	6 879 084	110,0	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
5	252 957	6 879 121	107,5	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
6	253 775	6 879 840	115,0	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
7	253 252	6 879 721	117,5	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
8	253 525	6 880 225	115,0	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
9	253 026	6 880 328	115,0	NORDEX N117/2400 2400...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
10	253 256	6 874 086	105,0	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
11	254 378	6 874 820	112,5	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
12	254 139	6 875 605	109,4	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
13	253 765	6 875 082	105,6	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
14	255 464	6 875 947	110,0	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
15	255 305	6 876 650	112,5	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
16	254 745	6 876 621	107,5	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
17	253 975	6 876 541	107,4	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
18	256 142	6 876 896	110,0	NORDEX N131/3000 3000...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0

Calculation Results

Sound level

Noise sensitive area				Demands			Sound level		Demands fulfilled ?		
No.	Name	East	North	Z	Immission height	Noise	From WTGs	Distance to noise demand	Noise	2 dB penalty applied for one or more WTGs	
				[m]	[m]	[dB(A)]	[dB(A)]	[m]			
A	Asuinrakennus A	249 740	6 878 307	92,4	4,0	40,0	25,0	2 720	Yes	No	
B	Asuinrakennus B	252 656	6 877 758	100,0	4,0	40,0	35,5	575	Yes	No	
C	Asuinrakennus C	251 251	6 876 536	93,1	4,0	40,0	28,4	2 142	Yes	No	
D	Asuinrakennus D	250 034	6 877 181	87,7	4,0	40,0	25,2	2 905	Yes	No	
E	Asuinrakennus E	250 125	6 879 799	95,0	4,0	40,0	26,4	2 268	Yes	No	
F	Asuinrakennus F	250 226	6 880 083	97,6	4,0	40,0	26,6	2 187	Yes	No	
G	Asuinrakennus G	249 740	6 878 942	94,8	4,0	40,0	25,2	2 611	Yes	No	
H	Asuinrakennus H	249 856	6 880 304	95,0	4,0	40,0	25,1	2 561	Yes	No	
I	Asuinrakennus I	250 438	6 881 151	96,3	4,0	40,0	26,0	2 142	Yes	No	
J	Asuinrakennus J	251 819	6 880 838	102,5	4,0	40,0	32,9	745	Yes	No	
K	Asuinrakennus K	252 204	6 881 690	105,0	4,0	40,0	30,8	1 029	Yes	No	

Project:

Paholammi /Neoen

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Calculated:

20.10.2021 15.24/3.4.388

DECIBEL - Main Result

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)

Distances (m)

WTG	A	B	C	D	E	F	G	H	I	J	K
1	3880	1241	3102	3831	3706	3719	3893	4148	4106	2910	3444
2	4434	1799	3653	4408	4158	4143	4415	4565	4417	3126	3519
3	4448	2113	3967	4571	3973	3917	4347	4325	4063	2710	3009
4	3824	1563	3387	3940	3435	3408	3747	3828	3681	2419	2903
5	3316	1394	3095	3506	2910	2893	3219	3317	3233	2059	2675
6	4313	2361	4154	4586	3647	3554	4130	3944	3583	2194	2425
7	3783	2050	3759	4097	3126	3045	3595	3444	3154	1816	2229
8	4240	2613	4330	4628	3423	3299	3993	3667	3220	1811	1971
9	3855	2594	4184	4339	2947	2809	3564	3168	2714	1310	1590
10	5490	3719	3164	4465	6510	6714	5991	7082	7601	6899	7671
11	5798	3403	3564	4940	6543	6698	6200	7103	7451	6535	7200
12	5159	2613	3032	4394	5801	5942	5517	6354	6663	5721	6381
13	5154	2895	2902	4278	5954	6122	5573	6519	6916	6072	6785
14	6187	3339	4251	5565	6579	6669	6456	7097	7230	6096	6600
15	5802	2869	4053	5294	6057	6126	6014	6556	6624	5445	5913
16	5278	2377	3493	4741	5603	5688	5513	6117	6246	5129	5666
17	4585	1793	2722	3990	5040	5153	4865	5575	5806	4804	5441
18	6551	3588	4900	6110	6676	6715	6716	7145	7111	5846	6200

DECIBEL - Detailed results

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9) **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s
Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
 (when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Asuinrakennus A

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 880	3 883	0	14,26	105,0	0,00	82,78	-	-	0,00	0,00	-
10	5 490	5 492	0	9,73	106,0	0,00	85,79	-	-	0,00	0,00	-
11	5 798	5 800	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
12	5 159	5 161	0	10,52	106,0	0,00	85,25	-	-	0,00	0,00	-
13	5 154	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
14	6 187	6 189	0	8,20	106,0	0,00	86,83	-	-	0,00	0,00	-
15	5 802	5 804	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
16	5 278	5 280	0	10,23	106,0	0,00	85,45	-	-	0,00	0,00	-
17	4 585	4 588	0	11,99	106,0	0,00	84,23	-	-	0,00	0,00	-
18	6 551	6 553	0	7,47	106,0	0,00	87,33	-	-	0,00	0,00	-
2	4 434	4 436	0	12,62	105,0	0,00	83,94	-	-	0,00	0,00	-
3	4 448	4 450	0	12,58	105,0	0,00	83,97	-	-	0,00	0,00	-
4	3 824	3 826	0	14,43	105,0	0,00	82,66	-	-	0,00	0,00	-
5	3 316	3 318	0	16,36	105,0	0,00	81,42	-	-	0,00	0,00	-
6	4 313	4 315	0	12,96	105,0	0,00	83,70	-	-	0,00	0,00	-
7	3 783	3 786	0	14,56	105,0	0,00	82,56	-	-	0,00	0,00	-
8	4 240	4 242	0	13,17	105,0	0,00	83,55	-	-	0,00	0,00	-
9	3 855	3 857	0	14,33	105,0	0,00	82,73	-	-	0,00	0,00	-
Sum				25,01								

- Data undefined due to calculation with octave data

Noise sensitive area: B Asuinrakennus B

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 241	1 247	0	29,02	105,0	0,00	72,92	-	-	0,00	0,00	-
10	3 719	3 722	0	14,92	106,0	0,00	82,41	-	-	0,00	0,00	-
11	3 403	3 406	0	16,17	106,0	0,00	81,65	-	-	0,00	0,00	-
12	2 613	2 617	0	19,83	106,0	0,00	79,36	-	-	0,00	0,00	-
13	2 895	2 899	0	18,42	106,0	0,00	80,24	-	-	0,00	0,00	-
14	3 339	3 343	0	16,43	106,0	0,00	81,48	-	-	0,00	0,00	-
15	2 869	2 873	0	18,55	106,0	0,00	80,17	-	-	0,00	0,00	-
16	2 377	2 381	0	21,12	106,0	0,00	78,54	-	-	0,00	0,00	-
17	1 793	1 799	0	24,83	106,0	0,00	76,10	-	-	0,00	0,00	-
18	3 588	3 591	0	15,42	106,0	0,00	82,10	-	-	0,00	0,00	-
2	1 799	1 804	0	24,46	105,0	0,00	76,12	-	-	0,00	0,00	-
3	2 113	2 117	0	22,39	105,0	0,00	77,51	-	-	0,00	0,00	-
4	1 563	1 568	0	26,22	105,0	0,00	74,91	-	-	0,00	0,00	-
5	1 394	1 400	0	27,62	105,0	0,00	73,92	-	-	0,00	0,00	-
6	2 361	2 365	0	20,94	105,0	0,00	78,48	-	-	0,00	0,00	-
7	2 050	2 054	0	22,78	105,0	0,00	77,25	-	-	0,00	0,00	-
8	2 613	2 616	0	19,59	105,0	0,00	79,35	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9) **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
9	2 594	2 597	0	19,69	105,0	0,00	79,29	-	-	0,00	0,00	-
Sum				35,52								

- Data undefined due to calculation with octave data

Noise sensitive area: C Asuinrakennus C

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 102	3 104	0	17,28	105,0	0,00	80,84	-	-	0,00	0,00	-
10	3 164	3 168	0	17,19	106,0	0,00	81,01	-	-	0,00	0,00	-
11	3 564	3 567	0	15,52	106,0	0,00	82,05	-	-	0,00	0,00	-
12	3 032	3 036	0	17,78	106,0	0,00	80,65	-	-	0,00	0,00	-
13	2 902	2 906	0	18,39	106,0	0,00	80,27	-	-	0,00	0,00	-
14	4 251	4 254	0	13,01	106,0	0,00	83,58	-	-	0,00	0,00	-
15	4 053	4 056	0	13,70	106,0	0,00	83,16	-	-	0,00	0,00	-
16	3 493	3 496	0	15,80	106,0	0,00	81,87	-	-	0,00	0,00	-
17	2 722	2 727	0	19,27	106,0	0,00	79,71	-	-	0,00	0,00	-
18	4 900	4 903	0	11,16	106,0	0,00	84,81	-	-	0,00	0,00	-
2	3 653	3 655	0	15,02	105,0	0,00	82,26	-	-	0,00	0,00	-
3	3 967	3 969	0	13,99	105,0	0,00	82,97	-	-	0,00	0,00	-
4	3 387	3 390	0	16,06	105,0	0,00	81,60	-	-	0,00	0,00	-
5	3 095	3 097	0	17,31	105,0	0,00	80,82	-	-	0,00	0,00	-
6	4 154	4 157	0	13,42	105,0	0,00	83,37	-	-	0,00	0,00	-
7	3 759	3 761	0	14,64	105,0	0,00	82,51	-	-	0,00	0,00	-
8	4 330	4 332	0	12,91	105,0	0,00	83,73	-	-	0,00	0,00	-
9	4 184	4 186	0	13,34	105,0	0,00	83,44	-	-	0,00	0,00	-
Sum				28,40								

- Data undefined due to calculation with octave data

Noise sensitive area: D Asuinrakennus D

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 831	3 833	0	14,41	105,0	0,00	82,67	-	-	0,00	0,00	-
10	4 465	4 468	0	12,32	106,0	0,00	84,00	-	-	0,00	0,00	-
11	4 940	4 943	0	11,06	106,0	0,00	84,88	-	-	0,00	0,00	-
12	4 394	4 397	0	12,54	106,0	0,00	83,86	-	-	0,00	0,00	-
13	4 278	4 281	0	12,92	106,0	0,00	83,63	-	-	0,00	0,00	-
14	5 565	5 568	0	9,56	106,0	0,00	85,91	-	-	0,00	0,00	-
15	5 294	5 297	0	10,19	106,0	0,00	85,48	-	-	0,00	0,00	-
16	4 741	4 744	0	11,58	106,0	0,00	84,52	-	-	0,00	0,00	-
17	3 990	3 993	0	13,92	106,0	0,00	83,03	-	-	0,00	0,00	-
18	6 110	6 113	0	8,36	106,0	0,00	86,72	-	-	0,00	0,00	-
2	4 408	4 411	0	12,69	105,0	0,00	83,89	-	-	0,00	0,00	-
3	4 571	4 573	0	12,24	105,0	0,00	84,20	-	-	0,00	0,00	-
4	3 940	3 943	0	14,07	105,0	0,00	82,92	-	-	0,00	0,00	-
5	3 506	3 508	0	15,59	105,0	0,00	81,90	-	-	0,00	0,00	-
6	4 586	4 589	0	12,20	105,0	0,00	84,23	-	-	0,00	0,00	-
7	4 097	4 100	0	13,59	105,0	0,00	83,26	-	-	0,00	0,00	-
8	4 628	4 631	0	12,08	105,0	0,00	84,31	-	-	0,00	0,00	-
9	4 339	4 342	0	12,88	105,0	0,00	83,75	-	-	0,00	0,00	-
Sum				25,22								

- Data undefined due to calculation with octave data

Noise sensitive area: E Asuinrakennus E

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 706	3 708	0	14,82	105,0	0,00	82,38	-	-	0,00	0,00	-
10	6 510	6 512	0	7,55	106,0	0,00	87,27	-	-	0,00	0,00	-
11	6 543	6 545	0	7,48	106,0	0,00	87,32	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9) **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
12	5 801	5 803	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
13	5 954	5 955	0	8,69	106,0	0,00	86,50	-	-	0,00	0,00	-
14	6 579	6 581	0	7,41	106,0	0,00	87,37	-	-	0,00	0,00	-
15	6 057	6 059	0	8,47	106,0	0,00	86,65	-	-	0,00	0,00	-
16	5 603	5 606	0	9,47	106,0	0,00	85,97	-	-	0,00	0,00	-
17	5 040	5 042	0	10,81	106,0	0,00	85,05	-	-	0,00	0,00	-
18	6 676	6 677	0	7,22	106,0	0,00	87,49	-	-	0,00	0,00	-
2	4 158	4 161	0	13,41	105,0	0,00	83,38	-	-	0,00	0,00	-
3	3 973	3 975	0	13,97	105,0	0,00	82,99	-	-	0,00	0,00	-
4	3 435	3 437	0	15,87	105,0	0,00	81,72	-	-	0,00	0,00	-
5	2 910	2 912	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-
6	3 647	3 650	0	15,04	105,0	0,00	82,25	-	-	0,00	0,00	-
7	3 126	3 129	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
8	3 423	3 426	0	15,92	105,0	0,00	81,70	-	-	0,00	0,00	-
9	2 947	2 950	0	17,97	105,0	0,00	80,40	-	-	0,00	0,00	-
Sum				26,36								

- Data undefined due to calculation with octave data

Noise sensitive area: F Asuinrakennus F

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 719	3 721	0	14,77	105,0	0,00	82,41	-	-	0,00	0,00	-
10	6 714	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
11	6 698	6 700	0	7,18	106,0	0,00	87,52	-	-	0,00	0,00	-
12	5 942	5 944	0	8,72	106,0	0,00	86,48	-	-	0,00	0,00	-
13	6 122	6 124	0	8,34	106,0	0,00	86,74	-	-	0,00	0,00	-
14	6 669	6 671	0	7,23	106,0	0,00	87,48	-	-	0,00	0,00	-
15	6 126	6 128	0	8,33	106,0	0,00	86,75	-	-	0,00	0,00	-
16	5 688	5 690	0	9,28	106,0	0,00	86,10	-	-	0,00	0,00	-
17	5 153	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
18	6 715	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
2	4 143	4 145	0	13,46	105,0	0,00	83,35	-	-	0,00	0,00	-
3	3 917	3 919	0	14,14	105,0	0,00	82,86	-	-	0,00	0,00	-
4	3 408	3 410	0	15,98	105,0	0,00	81,66	-	-	0,00	0,00	-
5	2 893	2 896	0	18,22	105,0	0,00	80,24	-	-	0,00	0,00	-
6	3 554	3 557	0	15,40	105,0	0,00	82,02	-	-	0,00	0,00	-
7	3 045	3 048	0	17,52	105,0	0,00	80,68	-	-	0,00	0,00	-
8	3 299	3 302	0	16,43	105,0	0,00	81,37	-	-	0,00	0,00	-
9	2 809	2 812	0	18,62	105,0	0,00	79,98	-	-	0,00	0,00	-
Sum				26,57								

- Data undefined due to calculation with octave data

Noise sensitive area: G Asuinrakennus G

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 893	3 895	0	14,22	105,0	0,00	82,81	-	-	0,00	0,00	-
10	5 991	5 993	0	8,61	106,0	0,00	86,55	-	-	0,00	0,00	-
11	6 200	6 202	0	8,17	106,0	0,00	86,85	-	-	0,00	0,00	-
12	5 517	5 520	0	9,67	106,0	0,00	85,84	-	-	0,00	0,00	-
13	5 573	5 575	0	9,54	106,0	0,00	85,92	-	-	0,00	0,00	-
14	6 456	6 458	0	7,65	106,0	0,00	87,20	-	-	0,00	0,00	-
15	6 014	6 016	0	8,56	106,0	0,00	86,59	-	-	0,00	0,00	-
16	5 513	5 515	0	9,68	106,0	0,00	85,83	-	-	0,00	0,00	-
17	4 865	4 867	0	11,26	106,0	0,00	84,75	-	-	0,00	0,00	-
18	6 716	6 718	0	7,14	106,0	0,00	87,54	-	-	0,00	0,00	-
2	4 415	4 417	0	12,67	105,0	0,00	83,90	-	-	0,00	0,00	-
3	4 347	4 349	0	12,86	105,0	0,00	83,77	-	-	0,00	0,00	-
4	3 747	3 749	0	14,68	105,0	0,00	82,48	-	-	0,00	0,00	-
5	3 219	3 222	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
6	4 130	4 132	0	13,49	105,0	0,00	83,32	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9) **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
7	3 595	3 598	0	15,24	105,0	0,00	82,12	-	-	0,00	0,00	-
8	3 993	3 995	0	13,91	105,0	0,00	83,03	-	-	0,00	0,00	-
9	3 564	3 566	0	15,36	105,0	0,00	82,04	-	-	0,00	0,00	-
Sum				25,17								

- Data undefined due to calculation with octave data

Noise sensitive area: H Asuinrakennus H

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	4 148	4 150	0	13,44	105,0	0,00	83,36	-	-	0,00	0,00	-
10	7 082	7 084	0	6,46	106,0	0,00	88,01	-	-	0,00	0,00	-
11	7 103	7 104	0	6,42	106,0	0,00	88,03	-	-	0,00	0,00	-
12	6 354	6 356	0	7,86	106,0	0,00	87,06	-	-	0,00	0,00	-
13	6 519	6 520	0	7,53	106,0	0,00	87,29	-	-	0,00	0,00	-
14	7 097	7 099	0	6,43	106,0	0,00	88,02	-	-	0,00	0,00	-
15	6 556	6 558	0	7,45	106,0	0,00	87,34	-	-	0,00	0,00	-
16	6 117	6 119	0	8,35	106,0	0,00	86,73	-	-	0,00	0,00	-
17	5 575	5 577	0	9,53	106,0	0,00	85,93	-	-	0,00	0,00	-
18	7 145	7 147	0	6,34	106,0	0,00	88,08	-	-	0,00	0,00	-
2	4 565	4 567	0	12,26	105,0	0,00	84,19	-	-	0,00	0,00	-
3	4 325	4 327	0	12,93	105,0	0,00	83,72	-	-	0,00	0,00	-
4	3 828	3 830	0	14,42	105,0	0,00	82,66	-	-	0,00	0,00	-
5	3 317	3 319	0	16,35	105,0	0,00	81,42	-	-	0,00	0,00	-
6	3 944	3 946	0	14,06	105,0	0,00	82,92	-	-	0,00	0,00	-
7	3 444	3 447	0	15,83	105,0	0,00	81,75	-	-	0,00	0,00	-
8	3 667	3 670	0	14,96	105,0	0,00	82,29	-	-	0,00	0,00	-
9	3 168	3 171	0	16,98	105,0	0,00	81,02	-	-	0,00	0,00	-
Sum				25,12								

- Data undefined due to calculation with octave data

Noise sensitive area: I Asuinrakennus I

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	4 106	4 108	0	13,57	105,0	0,00	83,27	-	-	0,00	0,00	-
10	7 601	7 603	0	5,54	106,0	0,00	88,62	-	-	0,00	0,00	-
11	7 451	7 453	0	5,80	106,0	0,00	88,45	-	-	0,00	0,00	-
12	6 663	6 665	0	7,25	106,0	0,00	87,48	-	-	0,00	0,00	-
13	6 916	6 918	0	6,76	106,0	0,00	87,80	-	-	0,00	0,00	-
14	7 230	7 232	0	6,19	106,0	0,00	88,18	-	-	0,00	0,00	-
15	6 624	6 626	0	7,32	106,0	0,00	87,43	-	-	0,00	0,00	-
16	6 246	6 248	0	8,08	106,0	0,00	86,92	-	-	0,00	0,00	-
17	5 806	5 808	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
18	7 111	7 113	0	6,40	106,0	0,00	88,04	-	-	0,00	0,00	-
2	4 417	4 419	0	12,66	105,0	0,00	83,91	-	-	0,00	0,00	-
3	4 063	4 065	0	13,70	105,0	0,00	83,18	-	-	0,00	0,00	-
4	3 681	3 683	0	14,91	105,0	0,00	82,32	-	-	0,00	0,00	-
5	3 233	3 235	0	16,71	105,0	0,00	81,20	-	-	0,00	0,00	-
6	3 583	3 585	0	15,29	105,0	0,00	82,09	-	-	0,00	0,00	-
7	3 154	3 157	0	17,04	105,0	0,00	80,99	-	-	0,00	0,00	-
8	3 220	3 223	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
9	2 714	2 717	0	19,08	105,0	0,00	79,68	-	-	0,00	0,00	-
Sum				26,03								

- Data undefined due to calculation with octave data

Noise sensitive area: J Asuinrakennus J

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	2 910	2 913	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9) **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
10	6 899	6 901	0	6,80	106,0	0,00	87,78	-	-	0,00	0,00	-
11	6 535	6 536	0	7,50	106,0	0,00	87,31	-	-	0,00	0,00	-
12	5 721	5 722	0	9,21	106,0	0,00	86,15	-	-	0,00	0,00	-
13	6 072	6 074	0	8,44	106,0	0,00	86,67	-	-	0,00	0,00	-
14	6 096	6 098	0	8,39	106,0	0,00	86,70	-	-	0,00	0,00	-
15	5 445	5 447	0	9,83	106,0	0,00	85,72	-	-	0,00	0,00	-
16	5 129	5 131	0	10,59	106,0	0,00	85,20	-	-	0,00	0,00	-
17	4 804	4 806	0	11,41	106,0	0,00	84,64	-	-	0,00	0,00	-
18	5 846	5 848	0	8,93	106,0	0,00	86,34	-	-	0,00	0,00	-
2	3 126	3 128	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
3	2 710	2 713	0	19,10	105,0	0,00	79,67	-	-	0,00	0,00	-
4	2 419	2 422	0	20,62	105,0	0,00	78,68	-	-	0,00	0,00	-
5	2 059	2 062	0	22,73	105,0	0,00	77,29	-	-	0,00	0,00	-
6	2 194	2 198	0	21,90	105,0	0,00	77,84	-	-	0,00	0,00	-
7	1 816	1 820	0	24,34	105,0	0,00	76,20	-	-	0,00	0,00	-
8	1 811	1 815	0	24,37	105,0	0,00	76,18	-	-	0,00	0,00	-
9	1 310	1 316	0	28,37	105,0	0,00	73,38	-	-	0,00	0,00	-
Sum				32,93								

- Data undefined due to calculation with octave data

Noise sensitive area: K Asuinrakennus K

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 444	3 445	0	15,84	105,0	0,00	81,74	-	-	0,00	0,00	-
10	7 671	7 673	0	5,42	106,0	0,00	88,70	-	-	0,00	0,00	-
11	7 200	7 202	0	6,24	106,0	0,00	88,15	-	-	0,00	0,00	-
12	6 381	6 382	0	7,80	106,0	0,00	87,10	-	-	0,00	0,00	-
13	6 785	6 787	0	7,01	106,0	0,00	87,63	-	-	0,00	0,00	-
14	6 600	6 601	0	7,37	106,0	0,00	87,39	-	-	0,00	0,00	-
15	5 913	5 915	0	8,78	106,0	0,00	86,44	-	-	0,00	0,00	-
16	5 666	5 668	0	9,33	106,0	0,00	86,07	-	-	0,00	0,00	-
17	5 441	5 443	0	9,84	106,0	0,00	85,72	-	-	0,00	0,00	-
18	6 200	6 201	0	8,18	106,0	0,00	86,85	-	-	0,00	0,00	-
2	3 519	3 522	0	15,54	105,0	0,00	81,93	-	-	0,00	0,00	-
3	3 009	3 012	0	17,69	105,0	0,00	80,58	-	-	0,00	0,00	-
4	2 903	2 905	0	18,18	105,0	0,00	80,26	-	-	0,00	0,00	-
5	2 675	2 678	0	19,28	105,0	0,00	79,56	-	-	0,00	0,00	-
6	2 425	2 428	0	20,59	105,0	0,00	78,71	-	-	0,00	0,00	-
7	2 229	2 232	0	21,70	105,0	0,00	77,98	-	-	0,00	0,00	-
8	1 971	1 975	0	23,30	105,0	0,00	76,91	-	-	0,00	0,00	-
9	1 590	1 595	0	26,01	105,0	0,00	75,05	-	-	0,00	0,00	-
Sum				30,84								

- Data undefined due to calculation with octave data

Project:

Paholammi / Neoen

Licensed user:

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Johanna Harju / johanna.harju@fcg.fi
Calculated:
20.10.2021 15.24/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)

Noise calculation model:

ISO 9613-2 Finland

Wind speed (in 10 m height):

8,0 m/s

Ground attenuation:

General, Ground factor: 0,4

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure tones penalty is added to total noise impact at receptors

Noise sensitive area

Height above ground level, when no value in NSA object:

4,0 m; Don't allow override of model height with height from NSA object

Uncertainty margin:

0,0 dB; Uncertainty margin in NSA has priority

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Frequency dependent air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,10	0,38	1,12	2,36	4,08	8,78	26,60	95,00

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N117/2400 2400 116.8 !O!

Noise: Level 0 - 105.0dB(A) Kirkkokallio

Source	Source/Date	Creator	Edited
NORDEX	16.4.2014	USER	19.10.2021 13.38
F008_146_A07_EN			
Revision 00			
2014-04-16			

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	120,0	8,0	105,0	No	85,3	90,9	96,1	98,1	99,5	98,9	95,1	83,5

WTG: NORDEX N131/3000 3000 131.0 !O!

Noise: Level - 106 dB(A) - R00

Source	Source/Date	Creator	Edited
NORDEX	11.3.2014	USER	20.10.2021 12.36
F008_246_A07_EN			
Revision 01			
2014-03-11			

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	144,0	8,0	106,0	No	84,4	91,5	96,3	97,9	100,8	99,7	97,3	87,2

Noise sensitive area: A Asuinrakennus A

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

DECIBEL - Assumptions for noise calculation

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)

Noise sensitive area: B Asuinrakennus B

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: C Asuinrakennus C

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: D Asuinrakennus D

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: E Asuinrakennus E

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: F Asuinrakennus F

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: G Asuinrakennus G

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: H Asuinrakennus H

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: I Asuinrakennus I

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Project:

Paholammi /Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

20.10.2021 15.24/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: J Asuinrakennus J

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: K Asuinrakennus K

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

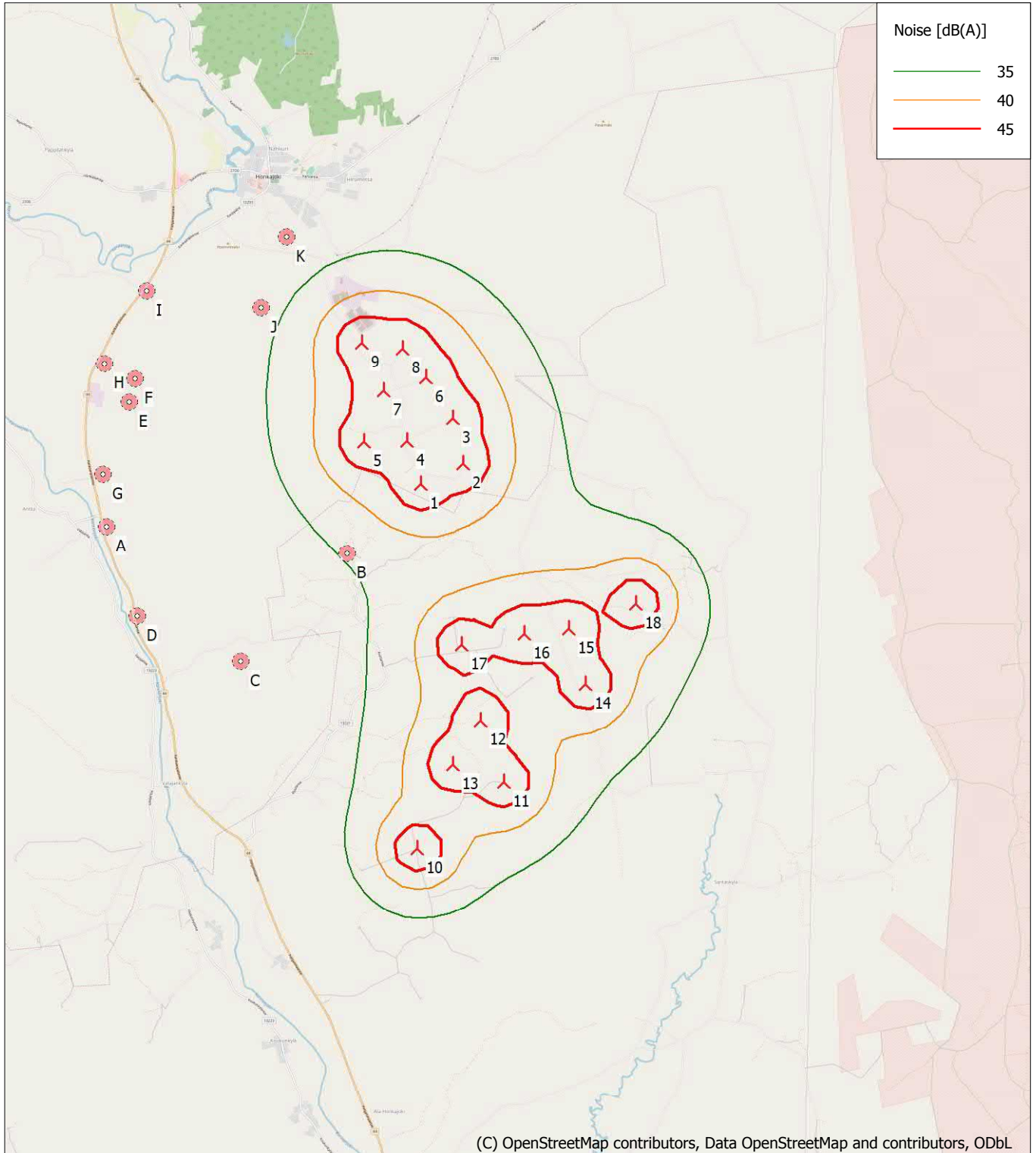
Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

DECIBEL - Map 8,0 m/s

Calculation: Nykytila_Melu_Kirkkokallio (N117 X 9) + Kooninkallio (N131 X 9)



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



Map: EMD OpenStreetMap , Print scale 1:70 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 254 549 North: 6 877 207

New WTG

Noise sensitive area

Noise calculation model: ISO 9613-2 Finland. Wind speed: 8,0 m/s

Height above sea level from active line object

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

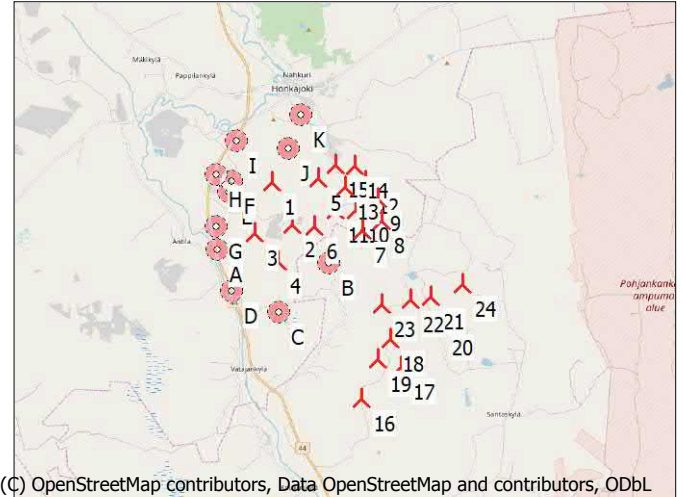
30.11.2021 8.44/3.4.388

DECIBEL - Main Result

Calculation: Melu_Paholammi_6 X V162_HH219m_STE

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014" from the Ministry of the Environment of Finland

All coordinates are in
Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:200 000

New WTG

Noise sensitive area

WTGs

East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data		Wind speed [m/s]	LwA,ref [dB(A)]
				Valid	Manufact.	Type-generator				Creator	Name		
1	251 304	6 879 975	107,5 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
2	251 747	6 878 810	105,0 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
3	250 727	6 878 659	100,0 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
4	251 315	6 877 881	105,0 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
5	252 523	6 879 987	107,5 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
6	252 334	6 878 721	102,5 VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
7	253 616	6 878 546	105,0 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
8	254 154	6 878 757	112,2 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
9	254 073	6 879 329	112,5 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
10	253 487	6 879 084	110,0 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
11	252 957	6 879 121	107,5 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
12	253 775	6 879 840	115,0 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
13	253 252	6 879 721	117,5 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
14	253 525	6 880 225	115,0 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
15	253 026	6 880 328	115,0 NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
16	253 256	6 874 086	105,0 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
17	254 378	6 874 820	112,5 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
18	254 139	6 875 605	109,4 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
19	253 765	6 875 082	105,6 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
20	255 464	6 875 947	110,0 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
21	255 305	6 876 650	112,5 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
22	254 745	6 876 621	107,5 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
23	253 975	6 876 541	107,4 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
24	256 142	6 876 896	110,0 NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0

Calculation Results

Sound level

Noise sensitive area

No.	Name	East	North	Z	Immission height [m]	Noise [dB(A)]	Sound level From WTGs [dB(A)]	Distance to noise demand [m]	Demands fulfilled ?		
									Noise	2 dB penalty applied for one or more WTGs	
A	Asuinrakennus A	249 740	6 878 307	92,4	4,0	40,0	34,0	569	Yes	No	
B	Asuinrakennus B	252 656	6 877 758	100,0	4,0	40,0	38,3	287	Yes	No	
C	Asuinrakennus C	251 251	6 876 536	93,1	4,0	40,0	32,8	869	Yes	No	
D	Asuinrakennus D	250 034	6 877 181	87,7	4,0	40,0	32,0	968	Yes	No	
E	Asuinrakennus E	250 125	6 879 799	95,0	4,0	40,0	34,4	693	Yes	No	
F	Asuinrakennus F	250 226	6 880 083	97,6	4,0	40,0	34,4	597	Yes	No	
G	Asuinrakennus G	249 740	6 878 942	94,8	4,0	40,0	34,2	558	Yes	No	
H	Asuinrakennus H	249 856	6 880 304	95,0	4,0	40,0	31,8	1 002	Yes	No	
I	Asuinrakennus I	250 438	6 881 151	96,3	4,0	40,0	31,5	1 001	Yes	No	
J	Asuinrakennus J	251 819	6 880 838	102,5	4,0	40,0	37,1	420	Yes	No	
K	Asuinrakennus K	252 204	6 881 690	105,0	4,0	40,0	33,1	924	Yes	No	

Project:

Paholammi /Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 8.44/3.4.388

DECIBEL - Main Result

Calculation: Melu_Paholammi_6 X V162_HH219m_STE

Distances (m)

WTG	A	B	C	D	E	F	G	H	I	J	K
1	2285	2595	3437	3067	1191	1082	1873	1484	1459	1005	1935
2	2067	1389	2326	2362	1898	1981	2009	2408	2680	2028	2914
3	1047	2128	2185	1631	1288	1508	1026	1860	2507	2436	3369
4	1630	1346	1345	1459	2255	2454	1897	2826	3383	2998	3908
5	3248	2231	3675	3748	2403	2297	2970	2684	2386	1104	1731
6	2625	1014	2437	2766	2456	2507	2601	2938	3080	2177	2970
7	3880	1241	3102	3831	3706	3719	3893	4148	4106	2910	3444
8	4434	1799	3653	4408	4158	4143	4415	4565	4417	3126	3519
9	4448	2113	3967	4571	3973	3917	4347	4325	4063	2710	3009
10	3824	1563	3387	3940	3435	3408	3747	3828	3681	2419	2903
11	3316	1394	3095	3506	2910	2893	3219	3317	3233	2059	2675
12	4313	2361	4154	4586	3647	3554	4130	3944	3583	2194	2425
13	3783	2050	3759	4097	3126	3045	3595	3444	3154	1816	2229
14	4240	2613	4330	4628	3423	3299	3993	3667	3220	1811	1971
15	3855	2594	4184	4339	2947	2809	3564	3168	2714	1310	1590
16	5490	3719	3164	4465	6510	6714	5991	7082	7601	6899	7671
17	5798	3403	3564	4940	6543	6698	6200	7103	7451	6535	7200
18	5159	2613	3032	4394	5801	5942	5517	6354	6663	5721	6381
19	5154	2895	2902	4278	5954	6122	5573	6519	6916	6072	6785
20	6187	3339	4251	5565	6579	6669	6456	7097	7230	6096	6600
21	5802	2869	4053	5294	6057	6126	6014	6556	6624	5445	5913
22	5278	2377	3493	4741	5603	5688	5513	6117	6246	5129	5666
23	4585	1793	2722	3990	5040	5153	4865	5575	5806	4804	5441
24	6551	3588	4900	6110	6676	6715	6716	7145	7111	5846	6200

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s
Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
 (when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Asuinrakennus A

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	2 285	2 296	0	21,85	104,3	0,00	78,22	-	-	0,00	0,00	-
10	3 824	3 826	0	14,43	105,0	0,00	82,66	-	-	0,00	0,00	-
11	3 316	3 318	0	16,36	105,0	0,00	81,42	-	-	0,00	0,00	-
12	4 313	4 315	0	12,96	105,0	0,00	83,70	-	-	0,00	0,00	-
13	3 783	3 786	0	14,56	105,0	0,00	82,56	-	-	0,00	0,00	-
14	4 240	4 242	0	13,17	105,0	0,00	83,55	-	-	0,00	0,00	-
15	3 855	3 857	0	14,33	105,0	0,00	82,73	-	-	0,00	0,00	-
16	5 490	5 492	0	9,73	106,0	0,00	85,79	-	-	0,00	0,00	-
17	5 798	5 800	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
18	5 159	5 161	0	10,52	106,0	0,00	85,25	-	-	0,00	0,00	-
19	5 154	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
2	2 067	2 080	0	23,12	104,3	0,00	77,36	-	-	0,00	0,00	-
20	6 187	6 189	0	8,20	106,0	0,00	86,83	-	-	0,00	0,00	-
21	5 802	5 804	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
22	5 278	5 280	0	10,23	106,0	0,00	85,45	-	-	0,00	0,00	-
23	4 585	4 588	0	11,99	106,0	0,00	84,23	-	-	0,00	0,00	-
24	6 551	6 553	0	7,47	106,0	0,00	87,33	-	-	0,00	0,00	-
3	1 047	1 070	0	31,06	104,3	0,00	71,59	-	-	0,00	0,00	-
4	1 630	1 646	0	26,02	104,3	0,00	75,33	-	-	0,00	0,00	-
5	3 248	3 256	0	17,21	104,3	0,00	81,25	-	-	0,00	0,00	-
6	2 625	2 634	0	20,06	104,3	0,00	79,41	-	-	0,00	0,00	-
7	3 880	3 883	0	14,26	105,0	0,00	82,78	-	-	0,00	0,00	-
8	4 434	4 436	0	12,62	105,0	0,00	83,94	-	-	0,00	0,00	-
9	4 448	4 450	0	12,58	105,0	0,00	83,97	-	-	0,00	0,00	-
Sum				33,99								

- Data undefined due to calculation with octave data

Noise sensitive area: B Asuinrakennus B

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	2 595	2 604	0	20,21	104,3	0,00	79,31	-	-	0,00	0,00	-
10	1 563	1 568	0	26,22	105,0	0,00	74,91	-	-	0,00	0,00	-
11	1 394	1 400	0	27,62	105,0	0,00	73,92	-	-	0,00	0,00	-
12	2 361	2 365	0	20,94	105,0	0,00	78,48	-	-	0,00	0,00	-
13	2 050	2 054	0	22,78	105,0	0,00	77,25	-	-	0,00	0,00	-
14	2 613	2 616	0	19,59	105,0	0,00	79,35	-	-	0,00	0,00	-
15	2 594	2 597	0	19,69	105,0	0,00	79,29	-	-	0,00	0,00	-
16	3 719	3 722	0	14,92	106,0	0,00	82,41	-	-	0,00	0,00	-
17	3 403	3 406	0	16,17	106,0	0,00	81,65	-	-	0,00	0,00	-
18	2 613	2 617	0	19,83	106,0	0,00	79,36	-	-	0,00	0,00	-
19	2 895	2 899	0	18,42	106,0	0,00	80,24	-	-	0,00	0,00	-

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DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	1 389	1 407	0	27,90	104,3	0,00	73,96	-	-	0,00	0,00	-
20	3 339	3 343	0	16,43	106,0	0,00	81,48	-	-	0,00	0,00	-
21	2 869	2 873	0	18,55	106,0	0,00	80,17	-	-	0,00	0,00	-
22	2 377	2 381	0	21,12	106,0	0,00	78,54	-	-	0,00	0,00	-
23	1 793	1 799	0	24,83	106,0	0,00	76,10	-	-	0,00	0,00	-
24	3 588	3 591	0	15,42	106,0	0,00	82,10	-	-	0,00	0,00	-
3	2 128	2 139	0	22,77	104,3	0,00	77,60	-	-	0,00	0,00	-
4	1 346	1 364	0	28,27	104,3	0,00	73,70	-	-	0,00	0,00	-
5	2 231	2 242	0	22,16	104,3	0,00	78,01	-	-	0,00	0,00	-
6	1 014	1 038	0	31,41	104,3	0,00	71,32	-	-	0,00	0,00	-
7	1 241	1 247	0	29,02	105,0	0,00	72,92	-	-	0,00	0,00	-
8	1 799	1 804	0	24,46	105,0	0,00	76,12	-	-	0,00	0,00	-
9	2 113	2 117	0	22,39	105,0	0,00	77,51	-	-	0,00	0,00	-
Sum				38,26								

- Data undefined due to calculation with octave data

Noise sensitive area: C Asuinrakennus C

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 437	3 444	0	16,44	104,3	0,00	81,74	-	-	0,00	0,00	-
10	3 387	3 390	0	16,06	105,0	0,00	81,60	-	-	0,00	0,00	-
11	3 095	3 097	0	17,31	105,0	0,00	80,82	-	-	0,00	0,00	-
12	4 154	4 157	0	13,42	105,0	0,00	83,37	-	-	0,00	0,00	-
13	3 759	3 761	0	14,64	105,0	0,00	82,51	-	-	0,00	0,00	-
14	4 330	4 332	0	12,91	105,0	0,00	83,73	-	-	0,00	0,00	-
15	4 184	4 186	0	13,34	105,0	0,00	83,44	-	-	0,00	0,00	-
16	3 164	3 168	0	17,19	106,0	0,00	81,01	-	-	0,00	0,00	-
17	3 564	3 567	0	15,52	106,0	0,00	82,05	-	-	0,00	0,00	-
18	3 032	3 036	0	17,78	106,0	0,00	80,65	-	-	0,00	0,00	-
19	2 902	2 906	0	18,39	106,0	0,00	80,27	-	-	0,00	0,00	-
2	2 326	2 337	0	21,63	104,3	0,00	78,37	-	-	0,00	0,00	-
20	4 251	4 254	0	13,01	106,0	0,00	83,58	-	-	0,00	0,00	-
21	4 053	4 056	0	13,70	106,0	0,00	83,16	-	-	0,00	0,00	-
22	3 493	3 496	0	15,80	106,0	0,00	81,87	-	-	0,00	0,00	-
23	2 722	2 727	0	19,27	106,0	0,00	79,71	-	-	0,00	0,00	-
24	4 900	4 903	0	11,16	106,0	0,00	84,81	-	-	0,00	0,00	-
3	2 185	2 196	0	22,43	104,3	0,00	77,83	-	-	0,00	0,00	-
4	1 345	1 364	0	28,26	104,3	0,00	73,70	-	-	0,00	0,00	-
5	3 675	3 682	0	15,52	104,3	0,00	82,32	-	-	0,00	0,00	-
6	2 437	2 447	0	21,03	104,3	0,00	78,77	-	-	0,00	0,00	-
7	3 102	3 104	0	17,28	105,0	0,00	80,84	-	-	0,00	0,00	-
8	3 653	3 655	0	15,02	105,0	0,00	82,26	-	-	0,00	0,00	-
9	3 967	3 969	0	13,99	105,0	0,00	82,97	-	-	0,00	0,00	-
Sum				32,76								

- Data undefined due to calculation with octave data

Noise sensitive area: D Asuinrakennus D

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 067	3 076	0	17,99	104,3	0,00	80,76	-	-	0,00	0,00	-
10	3 940	3 943	0	14,07	105,0	0,00	82,92	-	-	0,00	0,00	-
11	3 506	3 508	0	15,59	105,0	0,00	81,90	-	-	0,00	0,00	-
12	4 586	4 589	0	12,20	105,0	0,00	84,23	-	-	0,00	0,00	-
13	4 097	4 100	0	13,59	105,0	0,00	83,26	-	-	0,00	0,00	-
14	4 628	4 631	0	12,08	105,0	0,00	84,31	-	-	0,00	0,00	-
15	4 339	4 342	0	12,88	105,0	0,00	83,75	-	-	0,00	0,00	-
16	4 465	4 468	0	12,32	106,0	0,00	84,00	-	-	0,00	0,00	-
17	4 940	4 943	0	11,06	106,0	0,00	84,88	-	-	0,00	0,00	-
18	4 394	4 397	0	12,54	106,0	0,00	83,86	-	-	0,00	0,00	-
19	4 278	4 281	0	12,92	106,0	0,00	83,63	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	2 362	2 374	0	21,43	104,3	0,00	78,51	-	-	0,00	0,00	-
20	5 565	5 568	0	9,56	106,0	0,00	85,91	-	-	0,00	0,00	-
21	5 294	5 297	0	10,19	106,0	0,00	85,48	-	-	0,00	0,00	-
22	4 741	4 744	0	11,58	106,0	0,00	84,52	-	-	0,00	0,00	-
23	3 990	3 993	0	13,92	106,0	0,00	83,03	-	-	0,00	0,00	-
24	6 110	6 113	0	8,36	106,0	0,00	86,72	-	-	0,00	0,00	-
3	1 631	1 647	0	26,01	104,3	0,00	75,33	-	-	0,00	0,00	-
4	1 459	1 477	0	27,32	104,3	0,00	74,39	-	-	0,00	0,00	-
5	3 748	3 756	0	15,24	104,3	0,00	82,49	-	-	0,00	0,00	-
6	2 766	2 776	0	19,37	104,3	0,00	79,87	-	-	0,00	0,00	-
7	3 831	3 833	0	14,41	105,0	0,00	82,67	-	-	0,00	0,00	-
8	4 408	4 411	0	12,69	105,0	0,00	83,89	-	-	0,00	0,00	-
9	4 571	4 573	0	12,24	105,0	0,00	84,20	-	-	0,00	0,00	-
Sum				32,02								

- Data undefined due to calculation with octave data

Noise sensitive area: E Asuinrakennus E

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 191	1 212	0	29,64	104,3	0,00	72,67	-	-	0,00	0,00	-
10	3 435	3 437	0	15,87	105,0	0,00	81,72	-	-	0,00	0,00	-
11	2 910	2 912	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-
12	3 647	3 650	0	15,04	105,0	0,00	82,25	-	-	0,00	0,00	-
13	3 126	3 129	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
14	3 423	3 426	0	15,92	105,0	0,00	81,70	-	-	0,00	0,00	-
15	2 947	2 950	0	17,97	105,0	0,00	80,40	-	-	0,00	0,00	-
16	6 510	6 512	0	7,55	106,0	0,00	87,27	-	-	0,00	0,00	-
17	6 543	6 545	0	7,48	106,0	0,00	87,32	-	-	0,00	0,00	-
18	5 801	5 803	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
19	5 954	5 955	0	8,69	106,0	0,00	86,50	-	-	0,00	0,00	-
2	1 898	1 911	0	24,18	104,3	0,00	76,63	-	-	0,00	0,00	-
20	6 579	6 581	0	7,41	106,0	0,00	87,37	-	-	0,00	0,00	-
21	6 057	6 059	0	8,47	106,0	0,00	86,65	-	-	0,00	0,00	-
22	5 603	5 606	0	9,47	106,0	0,00	85,97	-	-	0,00	0,00	-
23	5 040	5 042	0	10,81	106,0	0,00	85,05	-	-	0,00	0,00	-
24	6 676	6 677	0	7,22	106,0	0,00	87,49	-	-	0,00	0,00	-
3	1 288	1 306	0	28,77	104,3	0,00	73,32	-	-	0,00	0,00	-
4	2 255	2 266	0	22,02	104,3	0,00	78,11	-	-	0,00	0,00	-
5	2 403	2 414	0	21,21	104,3	0,00	78,65	-	-	0,00	0,00	-
6	2 456	2 466	0	20,93	104,3	0,00	78,84	-	-	0,00	0,00	-
7	3 706	3 708	0	14,82	105,0	0,00	82,38	-	-	0,00	0,00	-
8	4 158	4 161	0	13,41	105,0	0,00	83,38	-	-	0,00	0,00	-
9	3 973	3 975	0	13,97	105,0	0,00	82,99	-	-	0,00	0,00	-
Sum				34,44								

- Data undefined due to calculation with octave data

Noise sensitive area: F Asuinrakennus F

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 082	1 105	0	30,69	104,3	0,00	71,87	-	-	0,00	0,00	-
10	3 408	3 410	0	15,98	105,0	0,00	81,66	-	-	0,00	0,00	-
11	2 893	2 896	0	18,22	105,0	0,00	80,24	-	-	0,00	0,00	-
12	3 554	3 557	0	15,40	105,0	0,00	82,02	-	-	0,00	0,00	-
13	3 045	3 048	0	17,52	105,0	0,00	80,68	-	-	0,00	0,00	-
14	3 299	3 302	0	16,43	105,0	0,00	81,37	-	-	0,00	0,00	-
15	2 809	2 812	0	18,62	105,0	0,00	79,98	-	-	0,00	0,00	-
16	6 714	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
17	6 698	6 700	0	7,18	106,0	0,00	87,52	-	-	0,00	0,00	-
18	5 942	5 944	0	8,72	106,0	0,00	86,48	-	-	0,00	0,00	-
19	6 122	6 124	0	8,34	106,0	0,00	86,74	-	-	0,00	0,00	-

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DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	1 981	1 994	0	23,65	104,3	0,00	76,99	-	-	0,00	0,00	-
20	6 669	6 671	0	7,23	106,0	0,00	87,48	-	-	0,00	0,00	-
21	6 126	6 128	0	8,33	106,0	0,00	86,75	-	-	0,00	0,00	-
22	5 688	5 690	0	9,28	106,0	0,00	86,10	-	-	0,00	0,00	-
23	5 153	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
24	6 715	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
3	1 508	1 524	0	26,95	104,3	0,00	74,66	-	-	0,00	0,00	-
4	2 454	2 464	0	20,94	104,3	0,00	78,83	-	-	0,00	0,00	-
5	2 297	2 308	0	21,79	104,3	0,00	78,26	-	-	0,00	0,00	-
6	2 507	2 517	0	20,66	104,3	0,00	79,02	-	-	0,00	0,00	-
7	3 719	3 721	0	14,77	105,0	0,00	82,41	-	-	0,00	0,00	-
8	4 143	4 145	0	13,46	105,0	0,00	83,35	-	-	0,00	0,00	-
9	3 917	3 919	0	14,14	105,0	0,00	82,86	-	-	0,00	0,00	-
Sum				34,39								

- Data undefined due to calculation with octave data

Noise sensitive area: G Asuinrakennus G

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 873	1 886	0	24,35	104,3	0,00	76,51	-	-	0,00	0,00	-
10	3 747	3 749	0	14,68	105,0	0,00	82,48	-	-	0,00	0,00	-
11	3 219	3 222	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
12	4 130	4 132	0	13,49	105,0	0,00	83,32	-	-	0,00	0,00	-
13	3 595	3 598	0	15,24	105,0	0,00	82,12	-	-	0,00	0,00	-
14	3 993	3 995	0	13,91	105,0	0,00	83,03	-	-	0,00	0,00	-
15	3 564	3 566	0	15,36	105,0	0,00	82,04	-	-	0,00	0,00	-
16	5 991	5 993	0	8,61	106,0	0,00	86,55	-	-	0,00	0,00	-
17	6 200	6 202	0	8,17	106,0	0,00	86,85	-	-	0,00	0,00	-
18	5 517	5 520	0	9,67	106,0	0,00	85,84	-	-	0,00	0,00	-
19	5 573	5 575	0	9,54	106,0	0,00	85,92	-	-	0,00	0,00	-
2	2 009	2 022	0	23,48	104,3	0,00	77,12	-	-	0,00	0,00	-
20	6 456	6 458	0	7,65	106,0	0,00	87,20	-	-	0,00	0,00	-
21	6 014	6 016	0	8,56	106,0	0,00	86,59	-	-	0,00	0,00	-
22	5 513	5 515	0	9,68	106,0	0,00	85,83	-	-	0,00	0,00	-
23	4 865	4 867	0	11,26	106,0	0,00	84,75	-	-	0,00	0,00	-
24	6 716	6 718	0	7,14	106,0	0,00	87,54	-	-	0,00	0,00	-
3	1 026	1 049	0	31,28	104,3	0,00	71,42	-	-	0,00	0,00	-
4	1 897	1 911	0	24,19	104,3	0,00	76,62	-	-	0,00	0,00	-
5	2 970	2 979	0	18,42	104,3	0,00	80,48	-	-	0,00	0,00	-
6	2 601	2 611	0	20,18	104,3	0,00	79,33	-	-	0,00	0,00	-
7	3 893	3 895	0	14,22	105,0	0,00	82,81	-	-	0,00	0,00	-
8	4 415	4 417	0	12,67	105,0	0,00	83,90	-	-	0,00	0,00	-
9	4 347	4 349	0	12,86	105,0	0,00	83,77	-	-	0,00	0,00	-
Sum				34,16								

- Data undefined due to calculation with octave data

Noise sensitive area: H Asuinrakennus H

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 484	1 501	0	27,13	104,3	0,00	74,53	-	-	0,00	0,00	-
10	3 828	3 830	0	14,42	105,0	0,00	82,66	-	-	0,00	0,00	-
11	3 317	3 319	0	16,35	105,0	0,00	81,42	-	-	0,00	0,00	-
12	3 944	3 946	0	14,06	105,0	0,00	82,92	-	-	0,00	0,00	-
13	3 444	3 447	0	15,83	105,0	0,00	81,75	-	-	0,00	0,00	-
14	3 667	3 670	0	14,96	105,0	0,00	82,29	-	-	0,00	0,00	-
15	3 168	3 171	0	16,98	105,0	0,00	81,02	-	-	0,00	0,00	-
16	7 082	7 084	0	6,46	106,0	0,00	88,01	-	-	0,00	0,00	-
17	7 103	7 104	0	6,42	106,0	0,00	88,03	-	-	0,00	0,00	-
18	6 354	6 356	0	7,86	106,0	0,00	87,06	-	-	0,00	0,00	-
19	6 519	6 520	0	7,53	106,0	0,00	87,29	-	-	0,00	0,00	-

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DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	2 408	2 419	0	21,18	104,3	0,00	78,67	-	-	0,00	0,00	-
20	7 097	7 099	0	6,43	106,0	0,00	88,02	-	-	0,00	0,00	-
21	6 556	6 558	0	7,45	106,0	0,00	87,34	-	-	0,00	0,00	-
22	6 117	6 119	0	8,35	106,0	0,00	86,73	-	-	0,00	0,00	-
23	5 575	5 577	0	9,53	106,0	0,00	85,93	-	-	0,00	0,00	-
24	7 145	7 147	0	6,34	106,0	0,00	88,08	-	-	0,00	0,00	-
3	1 860	1 873	0	24,43	104,3	0,00	76,45	-	-	0,00	0,00	-
4	2 826	2 835	0	19,09	104,3	0,00	80,05	-	-	0,00	0,00	-
5	2 684	2 694	0	19,77	104,3	0,00	79,61	-	-	0,00	0,00	-
6	2 938	2 947	0	18,57	104,3	0,00	80,39	-	-	0,00	0,00	-
7	4 148	4 150	0	13,44	105,0	0,00	83,36	-	-	0,00	0,00	-
8	4 565	4 567	0	12,26	105,0	0,00	84,19	-	-	0,00	0,00	-
9	4 325	4 327	0	12,93	105,0	0,00	83,72	-	-	0,00	0,00	-
Sum				31,76								

- Data undefined due to calculation with octave data

Noise sensitive area: I Asuinrakennus I

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 459	1 477	0	27,33	104,3	0,00	74,39	-	-	0,00	0,00	-
10	3 681	3 683	0	14,91	105,0	0,00	82,32	-	-	0,00	0,00	-
11	3 233	3 235	0	16,71	105,0	0,00	81,20	-	-	0,00	0,00	-
12	3 583	3 585	0	15,29	105,0	0,00	82,09	-	-	0,00	0,00	-
13	3 154	3 157	0	17,04	105,0	0,00	80,99	-	-	0,00	0,00	-
14	3 220	3 223	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
15	2 714	2 717	0	19,08	105,0	0,00	79,68	-	-	0,00	0,00	-
16	7 601	7 603	0	5,54	106,0	0,00	88,62	-	-	0,00	0,00	-
17	7 451	7 453	0	5,80	106,0	0,00	88,45	-	-	0,00	0,00	-
18	6 663	6 665	0	7,25	106,0	0,00	87,48	-	-	0,00	0,00	-
19	6 916	6 918	0	6,76	106,0	0,00	87,80	-	-	0,00	0,00	-
2	2 680	2 689	0	19,79	104,3	0,00	79,59	-	-	0,00	0,00	-
20	7 230	7 232	0	6,19	106,0	0,00	88,18	-	-	0,00	0,00	-
21	6 624	6 626	0	7,32	106,0	0,00	87,43	-	-	0,00	0,00	-
22	6 246	6 248	0	8,08	106,0	0,00	86,92	-	-	0,00	0,00	-
23	5 806	5 808	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
24	7 111	7 113	0	6,40	106,0	0,00	88,04	-	-	0,00	0,00	-
3	2 507	2 516	0	20,67	104,3	0,00	79,02	-	-	0,00	0,00	-
4	3 383	3 390	0	16,66	104,3	0,00	81,60	-	-	0,00	0,00	-
5	2 386	2 397	0	21,30	104,3	0,00	78,59	-	-	0,00	0,00	-
6	3 080	3 088	0	17,94	104,3	0,00	80,79	-	-	0,00	0,00	-
7	4 106	4 108	0	13,57	105,0	0,00	83,27	-	-	0,00	0,00	-
8	4 417	4 419	0	12,66	105,0	0,00	83,91	-	-	0,00	0,00	-
9	4 063	4 065	0	13,70	105,0	0,00	83,18	-	-	0,00	0,00	-
Sum				31,45								

- Data undefined due to calculation with octave data

Noise sensitive area: J Asuinrakennus J

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 005	1 029	0	31,51	104,3	0,00	71,24	-	-	0,00	0,00	-
10	2 419	2 422	0	20,62	105,0	0,00	78,68	-	-	0,00	0,00	-
11	2 059	2 062	0	22,73	105,0	0,00	77,29	-	-	0,00	0,00	-
12	2 194	2 198	0	21,90	105,0	0,00	77,84	-	-	0,00	0,00	-
13	1 816	1 820	0	24,34	105,0	0,00	76,20	-	-	0,00	0,00	-
14	1 811	1 815	0	24,37	105,0	0,00	76,18	-	-	0,00	0,00	-
15	1 310	1 316	0	28,37	105,0	0,00	73,38	-	-	0,00	0,00	-
16	6 899	6 901	0	6,80	106,0	0,00	87,78	-	-	0,00	0,00	-
17	6 535	6 536	0	7,50	106,0	0,00	87,31	-	-	0,00	0,00	-
18	5 721	5 722	0	9,21	106,0	0,00	86,15	-	-	0,00	0,00	-
19	6 072	6 074	0	8,44	106,0	0,00	86,67	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_HH219m_STENoise calculation model: ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	2 028	2 040	0	23,37	104,3	0,00	77,19	-	-	0,00	0,00	-
20	6 096	6 098	0	8,39	106,0	0,00	86,70	-	-	0,00	0,00	-
21	5 445	5 447	0	9,83	106,0	0,00	85,72	-	-	0,00	0,00	-
22	5 129	5 131	0	10,59	106,0	0,00	85,20	-	-	0,00	0,00	-
23	4 804	4 806	0	11,41	106,0	0,00	84,64	-	-	0,00	0,00	-
24	5 846	5 848	0	8,93	106,0	0,00	86,34	-	-	0,00	0,00	-
3	2 436	2 445	0	21,04	104,3	0,00	78,77	-	-	0,00	0,00	-
4	2 998	3 006	0	18,30	104,3	0,00	80,56	-	-	0,00	0,00	-
5	1 104	1 125	0	30,49	104,3	0,00	72,03	-	-	0,00	0,00	-
6	2 177	2 188	0	22,47	104,3	0,00	77,80	-	-	0,00	0,00	-
7	2 910	2 913	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-
8	3 126	3 128	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
9	2 710	2 713	0	19,10	105,0	0,00	79,67	-	-	0,00	0,00	-
Sum				37,06								

- Data undefined due to calculation with octave data

Noise sensitive area: K Asuinrakennus K

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 935	1 947	0	23,95	104,3	0,00	76,79	-	-	0,00	0,00	-
10	2 903	2 905	0	18,18	105,0	0,00	80,26	-	-	0,00	0,00	-
11	2 675	2 678	0	19,28	105,0	0,00	79,56	-	-	0,00	0,00	-
12	2 425	2 428	0	20,59	105,0	0,00	78,71	-	-	0,00	0,00	-
13	2 229	2 232	0	21,70	105,0	0,00	77,98	-	-	0,00	0,00	-
14	1 971	1 975	0	23,30	105,0	0,00	76,91	-	-	0,00	0,00	-
15	1 590	1 595	0	26,01	105,0	0,00	75,05	-	-	0,00	0,00	-
16	7 671	7 673	0	5,42	106,0	0,00	88,70	-	-	0,00	0,00	-
17	7 200	7 202	0	6,24	106,0	0,00	88,15	-	-	0,00	0,00	-
18	6 381	6 382	0	7,80	106,0	0,00	87,10	-	-	0,00	0,00	-
19	6 785	6 787	0	7,01	106,0	0,00	87,63	-	-	0,00	0,00	-
2	2 914	2 922	0	18,68	104,3	0,00	80,31	-	-	0,00	0,00	-
20	6 600	6 601	0	7,37	106,0	0,00	87,39	-	-	0,00	0,00	-
21	5 913	5 915	0	8,78	106,0	0,00	86,44	-	-	0,00	0,00	-
22	5 666	5 668	0	9,33	106,0	0,00	86,07	-	-	0,00	0,00	-
23	5 441	5 443	0	9,84	106,0	0,00	85,72	-	-	0,00	0,00	-
24	6 200	6 201	0	8,18	106,0	0,00	86,85	-	-	0,00	0,00	-
3	3 369	3 376	0	16,72	104,3	0,00	81,57	-	-	0,00	0,00	-
4	3 908	3 914	0	14,66	104,3	0,00	82,85	-	-	0,00	0,00	-
5	1 731	1 745	0	25,31	104,3	0,00	75,83	-	-	0,00	0,00	-
6	2 970	2 977	0	18,43	104,3	0,00	80,48	-	-	0,00	0,00	-
7	3 444	3 445	0	15,84	105,0	0,00	81,74	-	-	0,00	0,00	-
8	3 519	3 522	0	15,54	105,0	0,00	81,93	-	-	0,00	0,00	-
9	3 009	3 012	0	17,69	105,0	0,00	80,58	-	-	0,00	0,00	-
Sum				33,06								

- Data undefined due to calculation with octave data

Project:

Paholammi /Neoen

Licensed user:

FCG Finnish Consulting Group Oy
Osmontie 34, PO Box 950
FI-00601 Helsinki
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Johanna Harju / johanna.harju@fcg.fi
Calculated:
30.11.2021 8.44/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_HH219m_STE

Noise calculation model:

ISO 9613-2 Finland

Wind speed (in 10 m height):

8,0 m/s

Ground attenuation:

General, Ground factor: 0,4

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure tones penalty is added to total noise impact at receptors

Noise sensitive area

Height above ground level, when no value in NSA object:

4,0 m; Don't allow override of model height with height from NSA object

Uncertainty margin:

0,0 dB; Uncertainty margin in NSA has priority

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Frequency dependent air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,10	0,38	1,12	2,36	4,08	8,78	26,60	95,00

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89

WTG: VESTAS V162-6.0 HH169 6000 162.0 !O!

Noise: V162 - 6.0 MW Mode 0 STE - 10-2020

Source Source/Date Creator Edited
Vestas 26.10.2019 USER 30.11.2021 8.42
DMS no.: 0095-3732_00

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	219,0	8,0	104,3	No	84,1	91,9	96,9	99,2	98,7	95,4	89,4	80,4

WTG: NORDEX N117/2400 2400 116.8 !O!

Noise: Level 0 - 105.0dB(A) Kirkkokallio

Source Source/Date Creator Edited
NORDEX 16.4.2014 USER 19.10.2021 13.38
F008_146_A07_EN
Revision 00
2014-04-16

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	120,0	8,0	105,0	No	85,3	90,9	96,1	98,1	99,5	98,9	95,1	83,5

WTG: NORDEX N131/3000 3000 131.0 !O!

Noise: Level - 106 dB(A) - R00

Source Source/Date Creator Edited
NORDEX 11.3.2014 USER 20.10.2021 12.36
F008_246_A07_EN
Revision 01
2014-03-11

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	144,0	8,0	106,0	No	84,4	91,5	96,3	97,9	100,8	99,7	97,3	87,2

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_HH219m_STE

Noise sensitive area: A Asuinrakennus A

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: B Asuinrakennus B

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: C Asuinrakennus C

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: D Asuinrakennus D

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: E Asuinrakennus E

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: F Asuinrakennus F

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: G Asuinrakennus G

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: H Asuinrakennus H

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Project:

Paholammi /Neoen

Licensed user:

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 8.44/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_HH219m_STE

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: I Asuinrakennus I

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: J Asuinrakennus J

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: K Asuinrakennus K

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

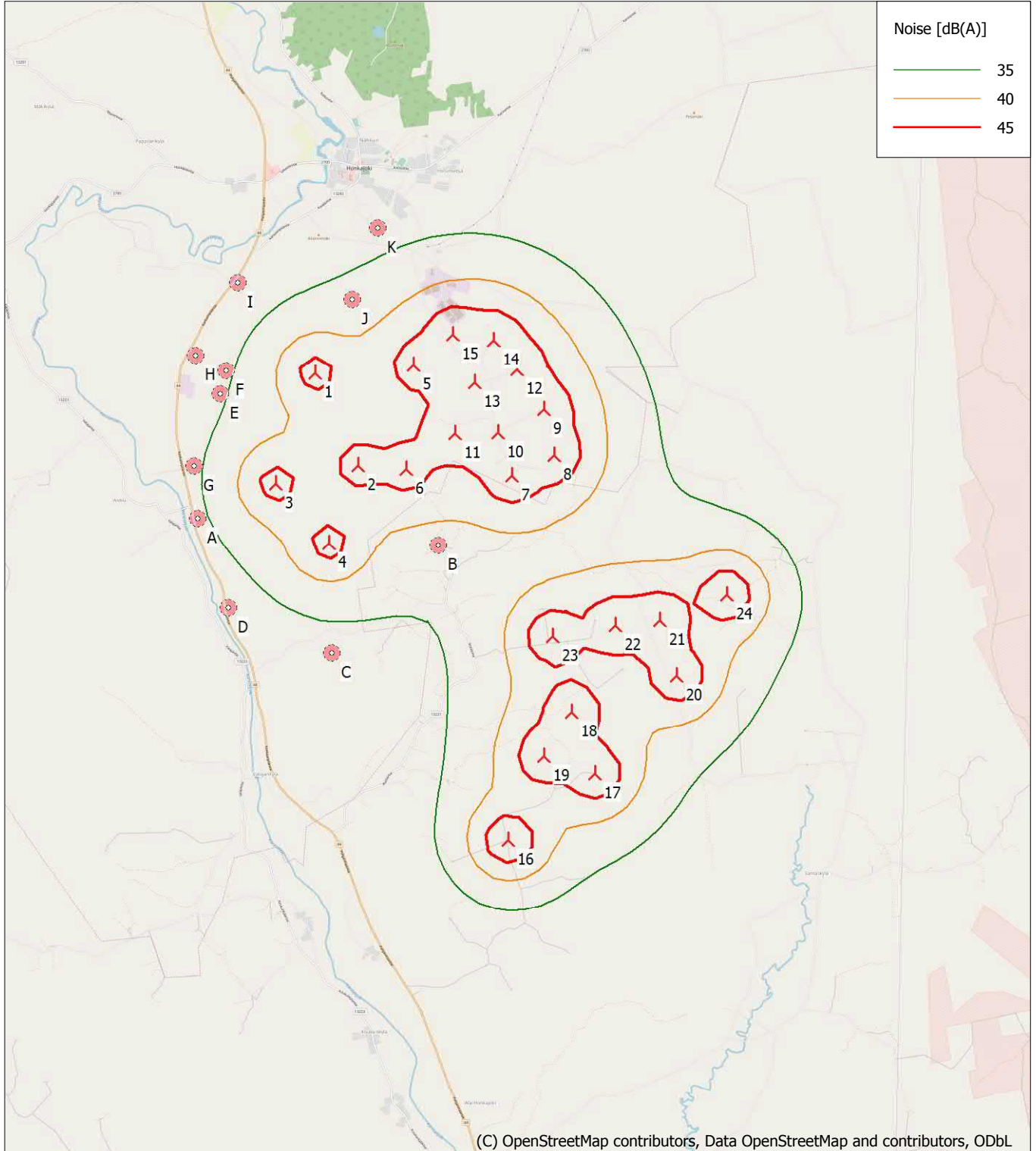
Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

DECIBEL - Map 8,0 m/s

Calculation: Melu_Paholammi_6 X V162_HH219m_STE



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



Map: EMD OpenStreetMap , Print scale 1:70 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 434 North: 6 877 207

New WTG

Noise sensitive area

Noise calculation model: ISO 9613-2 Finland. Wind speed: 8,0 m/s

Height above sea level from active line object

Project:

Paholammi / Neoen

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

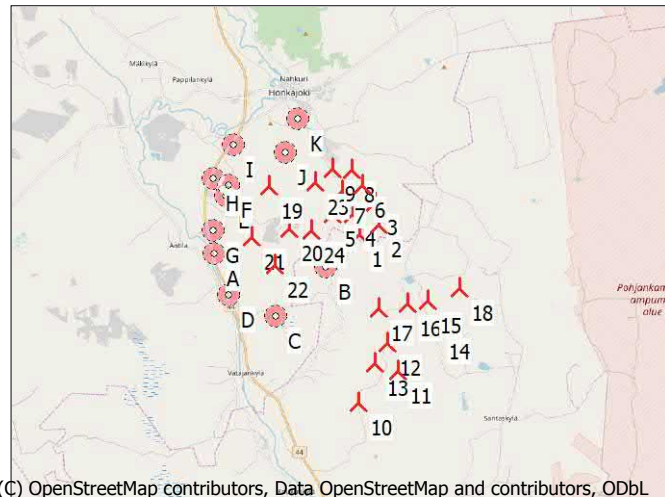
30.11.2021 8.43/3.4.388

DECIBEL - Main Result

Calculation: Melu_Paholammi_6 X V162_STE_HH169m

Calculation is done according to Finnish guideline " Ympäristöhallinnon ohjeita 2 | 2014" from the Ministry of the Environment of Finland

All coordinates are in Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:200 000

New WTG

Noise sensitive area

WTGs

	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Noise data		Wind speed [m/s]	LwA,ref [dB(A)]
					Valid	Manufact.	Type-generator				Creator	Name		
				[m]										
1	253 616	6 878 546	105,0	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
2	254 154	6 878 757	112,2	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
3	254 073	6 879 329	112,5	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
4	253 487	6 879 084	110,0	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
5	252 957	6 879 121	107,5	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
6	253 775	6 879 840	115,0	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
7	253 252	6 879 721	117,5	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
8	253 525	6 880 225	115,0	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
9	253 026	6 880 328	115,0	NORDEX N117/2400 2400 1...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	USER	Level 0 - 105.0dB(A) Kirkkokallio	8,0	105,0
10	253 256	6 874 086	105,0	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
11	254 378	6 874 820	112,5	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
12	254 139	6 875 605	109,4	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
13	253 765	6 875 082	105,6	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
14	255 464	6 875 947	110,0	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
15	255 305	6 876 650	112,5	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
16	254 745	6 876 621	107,5	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
17	253 975	6 876 541	107,4	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
18	256 142	6 876 896	110,0	NORDEX N131/3000 3000 1...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	USER	Level - 106 dB(A) - R00	8,0	106,0
19	251 304	6 879 975	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
20	251 747	6 878 810	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
21	250 727	6 878 659	100,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
22	251 315	6 877 881	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
23	252 523	6 879 987	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3
24	252 334	6 878 721	102,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	USER	V162 - 6.0 MW Mode 0 STE - 10-2020	8,0	104,3

Calculation Results

Sound level

Noise sensitive area

No.	Name	East	North	Z	Immission height [m]	Demands Noise [dB(A)]	Sound level From WTGs [dB(A)]	Distance to noise demand [m]	Demands fulfilled ?	
									Noise	2 dB penalty applied for one or more WTGs
A	Asuinrakennus A	249 740	6 878 307	92,4	4,0	40,0	34,1	551	Yes	No
B	Asuinrakennus B	252 656	6 877 758	100,0	4,0	40,0	38,3	277	Yes	No
C	Asuinrakennus C	251 251	6 876 536	93,1	4,0	40,0	32,8	852	Yes	No
D	Asuinrakennus D	250 034	6 877 181	87,7	4,0	40,0	32,1	950	Yes	No
E	Asuinrakennus E	250 125	6 879 799	95,0	4,0	40,0	34,5	674	Yes	No
F	Asuinrakennus F	250 226	6 880 083	97,6	4,0	40,0	34,4	577	Yes	No
G	Asuinrakennus G	249 740	6 878 942	94,8	4,0	40,0	34,2	538	Yes	No
H	Asuinrakennus H	249 856	6 880 304	95,0	4,0	40,0	31,8	983	Yes	No
I	Asuinrakennus I	250 438	6 881 151	96,3	4,0	40,0	31,5	978	Yes	No
J	Asuinrakennus J	251 819	6 880 838	102,5	4,0	40,0	37,1	407	Yes	No
K	Asuinrakennus K	252 204	6 881 690	105,0	4,0	40,0	33,1	922	Yes	No

Project:

Paholammi /Neoen

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 8.43/3.4.388

DECIBEL - Main Result

Calculation: Melu_Paholammi_6 X V162_STE_HH169m

Distances (m)

WTG	A	B	C	D	E	F	G	H	I	J	K
1	3880	1241	3102	3831	3706	3719	3893	4148	4106	2910	3444
2	4434	1799	3653	4408	4158	4143	4415	4565	4417	3126	3519
3	4448	2113	3967	4571	3973	3917	4347	4325	4063	2710	3009
4	3824	1563	3387	3940	3435	3408	3747	3828	3681	2419	2903
5	3316	1394	3095	3506	2910	2893	3219	3317	3233	2059	2675
6	4313	2361	4154	4586	3647	3554	4130	3944	3583	2194	2425
7	3783	2050	3759	4097	3126	3045	3595	3444	3154	1816	2229
8	4240	2613	4330	4628	3423	3299	3993	3667	3220	1811	1971
9	3855	2594	4184	4339	2947	2809	3564	3168	2714	1310	1590
10	5490	3719	3164	4465	6510	6714	5991	7082	7601	6899	7671
11	5798	3403	3564	4940	6543	6698	6200	7103	7451	6535	7200
12	5159	2613	3032	4394	5801	5942	5517	6354	6663	5721	6381
13	5154	2895	2902	4278	5954	6122	5573	6519	6916	6072	6785
14	6187	3339	4251	5565	6579	6669	6456	7097	7230	6096	6600
15	5802	2869	4053	5294	6057	6126	6014	6556	6624	5445	5913
16	5278	2377	3493	4741	5603	5688	5513	6117	6246	5129	5666
17	4585	1793	2722	3990	5040	5153	4865	5575	5806	4804	5441
18	6551	3588	4900	6110	6676	6715	6716	7145	7111	5846	6200
19	2285	2595	3437	3067	1191	1082	1873	1484	1459	1005	1935
20	2067	1389	2326	2362	1898	1981	2009	2408	2680	2028	2914
21	1047	2128	2185	1631	1288	1508	1026	1860	2507	2436	3369
22	1630	1346	1345	1459	2255	2454	1897	2826	3383	2998	3908
23	3248	2231	3675	3748	2403	2297	2970	2684	2386	1104	1731
24	2625	1014	2437	2766	2456	2507	2601	2938	3080	2177	2970

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s
Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
 (when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Asuinrakennus A

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 880	3 883	0	14,26	105,0	0,00	82,78	-	-	0,00	0,00	-
10	5 490	5 492	0	9,73	106,0	0,00	85,79	-	-	0,00	0,00	-
11	5 798	5 800	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
12	5 159	5 161	0	10,52	106,0	0,00	85,25	-	-	0,00	0,00	-
13	5 154	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
14	6 187	6 189	0	8,20	106,0	0,00	86,83	-	-	0,00	0,00	-
15	5 802	5 804	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
16	5 278	5 280	0	10,23	106,0	0,00	85,45	-	-	0,00	0,00	-
17	4 585	4 588	0	11,99	106,0	0,00	84,23	-	-	0,00	0,00	-
18	6 551	6 553	0	7,47	106,0	0,00	87,33	-	-	0,00	0,00	-
19	2 285	2 292	0	21,88	104,3	0,00	78,20	-	-	0,00	0,00	-
2	4 434	4 436	0	12,62	105,0	0,00	83,94	-	-	0,00	0,00	-
20	2 067	2 075	0	23,15	104,3	0,00	77,34	-	-	0,00	0,00	-
21	1 047	1 061	0	31,16	104,3	0,00	71,51	-	-	0,00	0,00	-
22	1 630	1 640	0	26,07	104,3	0,00	75,30	-	-	0,00	0,00	-
23	3 248	3 253	0	17,23	104,3	0,00	81,25	-	-	0,00	0,00	-
24	2 625	2 630	0	20,08	104,3	0,00	79,40	-	-	0,00	0,00	-
3	4 448	4 450	0	12,58	105,0	0,00	83,97	-	-	0,00	0,00	-
4	3 824	3 826	0	14,43	105,0	0,00	82,66	-	-	0,00	0,00	-
5	3 316	3 318	0	16,36	105,0	0,00	81,42	-	-	0,00	0,00	-
6	4 313	4 315	0	12,96	105,0	0,00	83,70	-	-	0,00	0,00	-
7	3 783	3 786	0	14,56	105,0	0,00	82,56	-	-	0,00	0,00	-
8	4 240	4 242	0	13,17	105,0	0,00	83,55	-	-	0,00	0,00	-
9	3 855	3 857	0	14,33	105,0	0,00	82,73	-	-	0,00	0,00	-
Sum				34,05								

- Data undefined due to calculation with octave data

Noise sensitive area: B Asuinrakennus B

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	1 241	1 247	0	29,02	105,0	0,00	72,92	-	-	0,00	0,00	-
10	3 719	3 722	0	14,92	106,0	0,00	82,41	-	-	0,00	0,00	-
11	3 403	3 406	0	16,17	106,0	0,00	81,65	-	-	0,00	0,00	-
12	2 613	2 617	0	19,83	106,0	0,00	79,36	-	-	0,00	0,00	-
13	2 895	2 899	0	18,42	106,0	0,00	80,24	-	-	0,00	0,00	-
14	3 339	3 343	0	16,43	106,0	0,00	81,48	-	-	0,00	0,00	-
15	2 869	2 873	0	18,55	106,0	0,00	80,17	-	-	0,00	0,00	-
16	2 377	2 381	0	21,12	106,0	0,00	78,54	-	-	0,00	0,00	-
17	1 793	1 799	0	24,83	106,0	0,00	76,10	-	-	0,00	0,00	-
18	3 588	3 591	0	15,42	106,0	0,00	82,10	-	-	0,00	0,00	-
19	2 595	2 601	0	20,23	104,3	0,00	79,30	-	-	0,00	0,00	-

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DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	1 799	1 804	0	24,46	105,0	0,00	76,12	-	-	0,00	0,00	-
20	1 389	1 400	0	27,96	104,3	0,00	73,92	-	-	0,00	0,00	-
21	2 128	2 134	0	22,79	104,3	0,00	77,58	-	-	0,00	0,00	-
22	1 346	1 357	0	28,33	104,3	0,00	73,65	-	-	0,00	0,00	-
23	2 231	2 238	0	22,19	104,3	0,00	78,00	-	-	0,00	0,00	-
24	1 014	1 028	0	31,51	104,3	0,00	71,24	-	-	0,00	0,00	-
3	2 113	2 117	0	22,39	105,0	0,00	77,51	-	-	0,00	0,00	-
4	1 563	1 568	0	26,22	105,0	0,00	74,91	-	-	0,00	0,00	-
5	1 394	1 400	0	27,62	105,0	0,00	73,92	-	-	0,00	0,00	-
6	2 361	2 365	0	20,94	105,0	0,00	78,48	-	-	0,00	0,00	-
7	2 050	2 054	0	22,78	105,0	0,00	77,25	-	-	0,00	0,00	-
8	2 613	2 616	0	19,59	105,0	0,00	79,35	-	-	0,00	0,00	-
9	2 594	2 597	0	19,69	105,0	0,00	79,29	-	-	0,00	0,00	-
Sum				38,29								

- Data undefined due to calculation with octave data

Noise sensitive area: C Asuinrakennus C

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 102	3 104	0	17,28	105,0	0,00	80,84	-	-	0,00	0,00	-
10	3 164	3 168	0	17,19	106,0	0,00	81,01	-	-	0,00	0,00	-
11	3 564	3 567	0	15,52	106,0	0,00	82,05	-	-	0,00	0,00	-
12	3 032	3 036	0	17,78	106,0	0,00	80,65	-	-	0,00	0,00	-
13	2 902	2 906	0	18,39	106,0	0,00	80,27	-	-	0,00	0,00	-
14	4 251	4 254	0	13,01	106,0	0,00	83,58	-	-	0,00	0,00	-
15	4 053	4 056	0	13,70	106,0	0,00	83,16	-	-	0,00	0,00	-
16	3 493	3 496	0	15,80	106,0	0,00	81,87	-	-	0,00	0,00	-
17	2 722	2 727	0	19,27	106,0	0,00	79,71	-	-	0,00	0,00	-
18	4 900	4 903	0	11,16	106,0	0,00	84,81	-	-	0,00	0,00	-
19	3 437	3 442	0	16,45	104,3	0,00	81,73	-	-	0,00	0,00	-
2	3 653	3 655	0	15,02	105,0	0,00	82,26	-	-	0,00	0,00	-
20	2 326	2 332	0	21,65	104,3	0,00	78,36	-	-	0,00	0,00	-
21	2 185	2 192	0	22,45	104,3	0,00	77,82	-	-	0,00	0,00	-
22	1 345	1 357	0	28,33	104,3	0,00	73,65	-	-	0,00	0,00	-
23	3 675	3 679	0	15,53	104,3	0,00	82,32	-	-	0,00	0,00	-
24	2 437	2 443	0	21,05	104,3	0,00	78,76	-	-	0,00	0,00	-
3	3 967	3 969	0	13,99	105,0	0,00	82,97	-	-	0,00	0,00	-
4	3 387	3 390	0	16,06	105,0	0,00	81,60	-	-	0,00	0,00	-
5	3 095	3 097	0	17,31	105,0	0,00	80,82	-	-	0,00	0,00	-
6	4 154	4 157	0	13,42	105,0	0,00	83,37	-	-	0,00	0,00	-
7	3 759	3 761	0	14,64	105,0	0,00	82,51	-	-	0,00	0,00	-
8	4 330	4 332	0	12,91	105,0	0,00	83,73	-	-	0,00	0,00	-
9	4 184	4 186	0	13,34	105,0	0,00	83,44	-	-	0,00	0,00	-
Sum				32,79								

- Data undefined due to calculation with octave data

Noise sensitive area: D Asuinrakennus D

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 831	3 833	0	14,41	105,0	0,00	82,67	-	-	0,00	0,00	-
10	4 465	4 468	0	12,32	106,0	0,00	84,00	-	-	0,00	0,00	-
11	4 940	4 943	0	11,06	106,0	0,00	84,88	-	-	0,00	0,00	-
12	4 394	4 397	0	12,54	106,0	0,00	83,86	-	-	0,00	0,00	-
13	4 278	4 281	0	12,92	106,0	0,00	83,63	-	-	0,00	0,00	-
14	5 565	5 568	0	9,56	106,0	0,00	85,91	-	-	0,00	0,00	-
15	5 294	5 297	0	10,19	106,0	0,00	85,48	-	-	0,00	0,00	-
16	4 741	4 744	0	11,58	106,0	0,00	84,52	-	-	0,00	0,00	-
17	3 990	3 993	0	13,92	106,0	0,00	83,03	-	-	0,00	0,00	-
18	6 110	6 113	0	8,36	106,0	0,00	86,72	-	-	0,00	0,00	-
19	3 067	3 073	0	18,00	104,3	0,00	80,75	-	-	0,00	0,00	-

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DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	4 408	4 411	0	12,69	105,0	0,00	83,89	-	-	0,00	0,00	-
20	2 362	2 369	0	21,45	104,3	0,00	78,49	-	-	0,00	0,00	-
21	1 631	1 641	0	26,06	104,3	0,00	75,30	-	-	0,00	0,00	-
22	1 459	1 470	0	27,38	104,3	0,00	74,35	-	-	0,00	0,00	-
23	3 748	3 753	0	15,25	104,3	0,00	82,49	-	-	0,00	0,00	-
24	2 766	2 772	0	19,39	104,3	0,00	79,86	-	-	0,00	0,00	-
3	4 571	4 573	0	12,24	105,0	0,00	84,20	-	-	0,00	0,00	-
4	3 940	3 943	0	14,07	105,0	0,00	82,92	-	-	0,00	0,00	-
5	3 506	3 508	0	15,59	105,0	0,00	81,90	-	-	0,00	0,00	-
6	4 586	4 589	0	12,20	105,0	0,00	84,23	-	-	0,00	0,00	-
7	4 097	4 100	0	13,59	105,0	0,00	83,26	-	-	0,00	0,00	-
8	4 628	4 631	0	12,08	105,0	0,00	84,31	-	-	0,00	0,00	-
9	4 339	4 342	0	12,88	105,0	0,00	83,75	-	-	0,00	0,00	-
Sum				32,06								

- Data undefined due to calculation with octave data

Noise sensitive area: E Asuinrakennus E

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 706	3 708	0	14,82	105,0	0,00	82,38	-	-	0,00	0,00	-
10	6 510	6 512	0	7,55	106,0	0,00	87,27	-	-	0,00	0,00	-
11	6 543	6 545	0	7,48	106,0	0,00	87,32	-	-	0,00	0,00	-
12	5 801	5 803	0	9,03	106,0	0,00	86,27	-	-	0,00	0,00	-
13	5 954	5 955	0	8,69	106,0	0,00	86,50	-	-	0,00	0,00	-
14	6 579	6 581	0	7,41	106,0	0,00	87,37	-	-	0,00	0,00	-
15	6 057	6 059	0	8,47	106,0	0,00	86,65	-	-	0,00	0,00	-
16	5 603	5 606	0	9,47	106,0	0,00	85,97	-	-	0,00	0,00	-
17	5 040	5 042	0	10,81	106,0	0,00	85,05	-	-	0,00	0,00	-
18	6 676	6 677	0	7,22	106,0	0,00	87,49	-	-	0,00	0,00	-
19	1 191	1 204	0	29,72	104,3	0,00	72,61	-	-	0,00	0,00	-
2	4 158	4 161	0	13,41	105,0	0,00	83,38	-	-	0,00	0,00	-
20	1 898	1 906	0	24,22	104,3	0,00	76,60	-	-	0,00	0,00	-
21	1 288	1 299	0	28,84	104,3	0,00	73,27	-	-	0,00	0,00	-
22	2 255	2 262	0	22,05	104,3	0,00	78,09	-	-	0,00	0,00	-
23	2 403	2 410	0	21,23	104,3	0,00	78,64	-	-	0,00	0,00	-
24	2 456	2 462	0	20,95	104,3	0,00	78,83	-	-	0,00	0,00	-
3	3 973	3 975	0	13,97	105,0	0,00	82,99	-	-	0,00	0,00	-
4	3 435	3 437	0	15,87	105,0	0,00	81,72	-	-	0,00	0,00	-
5	2 910	2 912	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-
6	3 647	3 650	0	15,04	105,0	0,00	82,25	-	-	0,00	0,00	-
7	3 126	3 129	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
8	3 423	3 426	0	15,92	105,0	0,00	81,70	-	-	0,00	0,00	-
9	2 947	2 950	0	17,97	105,0	0,00	80,40	-	-	0,00	0,00	-
Sum				34,50								

- Data undefined due to calculation with octave data

Noise sensitive area: F Asuinrakennus F

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 719	3 721	0	14,77	105,0	0,00	82,41	-	-	0,00	0,00	-
10	6 714	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
11	6 698	6 700	0	7,18	106,0	0,00	87,52	-	-	0,00	0,00	-
12	5 942	5 944	0	8,72	106,0	0,00	86,48	-	-	0,00	0,00	-
13	6 122	6 124	0	8,34	106,0	0,00	86,74	-	-	0,00	0,00	-
14	6 669	6 671	0	7,23	106,0	0,00	87,48	-	-	0,00	0,00	-
15	6 126	6 128	0	8,33	106,0	0,00	86,75	-	-	0,00	0,00	-
16	5 688	5 690	0	9,28	106,0	0,00	86,10	-	-	0,00	0,00	-
17	5 153	5 156	0	10,53	106,0	0,00	85,25	-	-	0,00	0,00	-
18	6 715	6 716	0	7,15	106,0	0,00	87,54	-	-	0,00	0,00	-
19	1 082	1 096	0	30,79	104,3	0,00	71,80	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

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WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	4 143	4 145	0	13,46	105,0	0,00	83,35	-	-	0,00	0,00	-
20	1 981	1 989	0	23,68	104,3	0,00	76,97	-	-	0,00	0,00	-
21	1 508	1 517	0	27,00	104,3	0,00	74,62	-	-	0,00	0,00	-
22	2 454	2 460	0	20,96	104,3	0,00	78,82	-	-	0,00	0,00	-
23	2 297	2 304	0	21,81	104,3	0,00	78,25	-	-	0,00	0,00	-
24	2 507	2 513	0	20,68	104,3	0,00	79,00	-	-	0,00	0,00	-
3	3 917	3 919	0	14,14	105,0	0,00	82,86	-	-	0,00	0,00	-
4	3 408	3 410	0	15,98	105,0	0,00	81,66	-	-	0,00	0,00	-
5	2 893	2 896	0	18,22	105,0	0,00	80,24	-	-	0,00	0,00	-
6	3 554	3 557	0	15,40	105,0	0,00	82,02	-	-	0,00	0,00	-
7	3 045	3 048	0	17,52	105,0	0,00	80,68	-	-	0,00	0,00	-
8	3 299	3 302	0	16,43	105,0	0,00	81,37	-	-	0,00	0,00	-
9	2 809	2 812	0	18,62	105,0	0,00	79,98	-	-	0,00	0,00	-
Sum				34,44								

- Data undefined due to calculation with octave data

Noise sensitive area: G Asuinrakennus G

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 893	3 895	0	14,22	105,0	0,00	82,81	-	-	0,00	0,00	-
10	5 991	5 993	0	8,61	106,0	0,00	86,55	-	-	0,00	0,00	-
11	6 200	6 202	0	8,17	106,0	0,00	86,85	-	-	0,00	0,00	-
12	5 517	5 520	0	9,67	106,0	0,00	85,84	-	-	0,00	0,00	-
13	5 573	5 575	0	9,54	106,0	0,00	85,92	-	-	0,00	0,00	-
14	6 456	6 458	0	7,65	106,0	0,00	87,20	-	-	0,00	0,00	-
15	6 014	6 016	0	8,56	106,0	0,00	86,59	-	-	0,00	0,00	-
16	5 513	5 515	0	9,68	106,0	0,00	85,83	-	-	0,00	0,00	-
17	4 865	4 867	0	11,26	106,0	0,00	84,75	-	-	0,00	0,00	-
18	6 716	6 718	0	7,14	106,0	0,00	87,54	-	-	0,00	0,00	-
19	1 873	1 881	0	24,38	104,3	0,00	76,49	-	-	0,00	0,00	-
2	4 415	4 417	0	12,67	105,0	0,00	83,90	-	-	0,00	0,00	-
20	2 009	2 017	0	23,51	104,3	0,00	77,09	-	-	0,00	0,00	-
21	1 026	1 040	0	31,38	104,3	0,00	71,34	-	-	0,00	0,00	-
22	1 897	1 905	0	24,22	104,3	0,00	76,60	-	-	0,00	0,00	-
23	2 970	2 975	0	18,44	104,3	0,00	80,47	-	-	0,00	0,00	-
24	2 601	2 607	0	20,20	104,3	0,00	79,32	-	-	0,00	0,00	-
3	4 347	4 349	0	12,86	105,0	0,00	83,77	-	-	0,00	0,00	-
4	3 747	3 749	0	14,68	105,0	0,00	82,48	-	-	0,00	0,00	-
5	3 219	3 222	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
6	4 130	4 132	0	13,49	105,0	0,00	83,32	-	-	0,00	0,00	-
7	3 595	3 598	0	15,24	105,0	0,00	82,12	-	-	0,00	0,00	-
8	3 993	3 995	0	13,91	105,0	0,00	83,03	-	-	0,00	0,00	-
9	3 564	3 566	0	15,36	105,0	0,00	82,04	-	-	0,00	0,00	-
Sum				34,22								

- Data undefined due to calculation with octave data

Noise sensitive area: H Asuinrakennus H

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	4 148	4 150	0	13,44	105,0	0,00	83,36	-	-	0,00	0,00	-
10	7 082	7 084	0	6,46	106,0	0,00	88,01	-	-	0,00	0,00	-
11	7 103	7 104	0	6,42	106,0	0,00	88,03	-	-	0,00	0,00	-
12	6 354	6 356	0	7,86	106,0	0,00	87,06	-	-	0,00	0,00	-
13	6 519	6 520	0	7,53	106,0	0,00	87,29	-	-	0,00	0,00	-
14	7 097	7 099	0	6,43	106,0	0,00	88,02	-	-	0,00	0,00	-
15	6 556	6 558	0	7,45	106,0	0,00	87,34	-	-	0,00	0,00	-
16	6 117	6 119	0	8,35	106,0	0,00	86,73	-	-	0,00	0,00	-
17	5 575	5 577	0	9,53	106,0	0,00	85,93	-	-	0,00	0,00	-
18	7 145	7 147	0	6,34	106,0	0,00	88,08	-	-	0,00	0,00	-
19	1 484	1 494	0	27,18	104,3	0,00	74,49	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	4 565	4 567	0	12,26	105,0	0,00	84,19	-	-	0,00	0,00	-
20	2 408	2 415	0	21,20	104,3	0,00	78,66	-	-	0,00	0,00	-
21	1 860	1 868	0	24,47	104,3	0,00	76,43	-	-	0,00	0,00	-
22	2 826	2 832	0	19,10	104,3	0,00	80,04	-	-	0,00	0,00	-
23	2 684	2 690	0	19,79	104,3	0,00	79,59	-	-	0,00	0,00	-
24	2 938	2 943	0	18,58	104,3	0,00	80,38	-	-	0,00	0,00	-
3	4 325	4 327	0	12,93	105,0	0,00	83,72	-	-	0,00	0,00	-
4	3 828	3 830	0	14,42	105,0	0,00	82,66	-	-	0,00	0,00	-
5	3 317	3 319	0	16,35	105,0	0,00	81,42	-	-	0,00	0,00	-
6	3 944	3 946	0	14,06	105,0	0,00	82,92	-	-	0,00	0,00	-
7	3 444	3 447	0	15,83	105,0	0,00	81,75	-	-	0,00	0,00	-
8	3 667	3 670	0	14,96	105,0	0,00	82,29	-	-	0,00	0,00	-
9	3 168	3 171	0	16,98	105,0	0,00	81,02	-	-	0,00	0,00	-
Sum				31,78								

- Data undefined due to calculation with octave data

Noise sensitive area: I Asuinrakennus I

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	4 106	4 108	0	13,57	105,0	0,00	83,27	-	-	0,00	0,00	-
10	7 601	7 603	0	5,54	106,0	0,00	88,62	-	-	0,00	0,00	-
11	7 451	7 453	0	5,80	106,0	0,00	88,45	-	-	0,00	0,00	-
12	6 663	6 665	0	7,25	106,0	0,00	87,48	-	-	0,00	0,00	-
13	6 916	6 918	0	6,76	106,0	0,00	87,80	-	-	0,00	0,00	-
14	7 230	7 232	0	6,19	106,0	0,00	88,18	-	-	0,00	0,00	-
15	6 624	6 626	0	7,32	106,0	0,00	87,43	-	-	0,00	0,00	-
16	6 246	6 248	0	8,08	106,0	0,00	86,92	-	-	0,00	0,00	-
17	5 806	5 808	0	9,02	106,0	0,00	86,28	-	-	0,00	0,00	-
18	7 111	7 113	0	6,40	106,0	0,00	88,04	-	-	0,00	0,00	-
19	1 459	1 470	0	27,38	104,3	0,00	74,35	-	-	0,00	0,00	-
2	4 417	4 419	0	12,66	105,0	0,00	83,91	-	-	0,00	0,00	-
20	2 680	2 686	0	19,81	104,3	0,00	79,58	-	-	0,00	0,00	-
21	2 507	2 512	0	20,69	104,3	0,00	79,00	-	-	0,00	0,00	-
22	3 383	3 387	0	16,67	104,3	0,00	81,60	-	-	0,00	0,00	-
23	2 386	2 392	0	21,32	104,3	0,00	78,58	-	-	0,00	0,00	-
24	3 080	3 085	0	17,95	104,3	0,00	80,78	-	-	0,00	0,00	-
3	4 063	4 065	0	13,70	105,0	0,00	83,18	-	-	0,00	0,00	-
4	3 681	3 683	0	14,91	105,0	0,00	82,32	-	-	0,00	0,00	-
5	3 233	3 235	0	16,71	105,0	0,00	81,20	-	-	0,00	0,00	-
6	3 583	3 585	0	15,29	105,0	0,00	82,09	-	-	0,00	0,00	-
7	3 154	3 157	0	17,04	105,0	0,00	80,99	-	-	0,00	0,00	-
8	3 220	3 223	0	16,76	105,0	0,00	81,16	-	-	0,00	0,00	-
9	2 714	2 717	0	19,08	105,0	0,00	79,68	-	-	0,00	0,00	-
Sum				31,48								

- Data undefined due to calculation with octave data

Noise sensitive area: J Asuinrakennus J

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	2 910	2 913	0	18,15	105,0	0,00	80,29	-	-	0,00	0,00	-
10	6 899	6 901	0	6,80	106,0	0,00	87,78	-	-	0,00	0,00	-
11	6 535	6 536	0	7,50	106,0	0,00	87,31	-	-	0,00	0,00	-
12	5 721	5 722	0	9,21	106,0	0,00	86,15	-	-	0,00	0,00	-
13	6 072	6 074	0	8,44	106,0	0,00	86,67	-	-	0,00	0,00	-
14	6 096	6 098	0	8,39	106,0	0,00	86,70	-	-	0,00	0,00	-
15	5 445	5 447	0	9,83	106,0	0,00	85,72	-	-	0,00	0,00	-
16	5 129	5 131	0	10,59	106,0	0,00	85,20	-	-	0,00	0,00	-
17	4 804	4 806	0	11,41	106,0	0,00	84,64	-	-	0,00	0,00	-
18	5 846	5 848	0	8,93	106,0	0,00	86,34	-	-	0,00	0,00	-
19	1 005	1 019	0	31,61	104,3	0,00	71,16	-	-	0,00	0,00	-

To be continued on next page...

DECIBEL - Detailed results

Calculation: Melu_Paholammi_6 X V162_STE_HH169m **Noise calculation model:** ISO 9613-2 Finland 8,0 m/s

...continued from previous page

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
2	3 126	3 128	0	17,17	105,0	0,00	80,91	-	-	0,00	0,00	-
20	2 028	2 035	0	23,39	104,3	0,00	77,17	-	-	0,00	0,00	-
21	2 436	2 441	0	21,06	104,3	0,00	78,75	-	-	0,00	0,00	-
22	2 998	3 003	0	18,31	104,3	0,00	80,55	-	-	0,00	0,00	-
23	1 104	1 117	0	30,58	104,3	0,00	71,96	-	-	0,00	0,00	-
24	2 177	2 184	0	22,50	104,3	0,00	77,78	-	-	0,00	0,00	-
3	2 710	2 713	0	19,10	105,0	0,00	79,67	-	-	0,00	0,00	-
4	2 419	2 422	0	20,62	105,0	0,00	78,68	-	-	0,00	0,00	-
5	2 059	2 062	0	22,73	105,0	0,00	77,29	-	-	0,00	0,00	-
6	2 194	2 198	0	21,90	105,0	0,00	77,84	-	-	0,00	0,00	-
7	1 816	1 820	0	24,34	105,0	0,00	76,20	-	-	0,00	0,00	-
8	1 811	1 815	0	24,37	105,0	0,00	76,18	-	-	0,00	0,00	-
9	1 310	1 316	0	28,37	105,0	0,00	73,38	-	-	0,00	0,00	-
Sum				37,12								

- Data undefined due to calculation with octave data

Noise sensitive area: K Asuinrakennus K

Wind speed: 8,0 m/s

WTG

No.	Distance [m]	Sound distance [m]	Penalty [dB]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]
1	3 444	3 445	0	15,84	105,0	0,00	81,74	-	-	0,00	0,00	-
10	7 671	7 673	0	5,42	106,0	0,00	88,70	-	-	0,00	0,00	-
11	7 200	7 202	0	6,24	106,0	0,00	88,15	-	-	0,00	0,00	-
12	6 381	6 382	0	7,80	106,0	0,00	87,10	-	-	0,00	0,00	-
13	6 785	6 787	0	7,01	106,0	0,00	87,63	-	-	0,00	0,00	-
14	6 600	6 601	0	7,37	106,0	0,00	87,39	-	-	0,00	0,00	-
15	5 913	5 915	0	8,78	106,0	0,00	86,44	-	-	0,00	0,00	-
16	5 666	5 668	0	9,33	106,0	0,00	86,07	-	-	0,00	0,00	-
17	5 441	5 443	0	9,84	106,0	0,00	85,72	-	-	0,00	0,00	-
18	6 200	6 201	0	8,18	106,0	0,00	86,85	-	-	0,00	0,00	-
19	1 935	1 943	0	23,98	104,3	0,00	76,77	-	-	0,00	0,00	-
2	3 519	3 522	0	15,54	105,0	0,00	81,93	-	-	0,00	0,00	-
20	2 914	2 918	0	18,70	104,3	0,00	80,30	-	-	0,00	0,00	-
21	3 369	3 373	0	16,73	104,3	0,00	81,56	-	-	0,00	0,00	-
22	3 908	3 912	0	14,67	104,3	0,00	82,85	-	-	0,00	0,00	-
23	1 731	1 739	0	25,35	104,3	0,00	75,81	-	-	0,00	0,00	-
24	2 970	2 974	0	18,44	104,3	0,00	80,47	-	-	0,00	0,00	-
3	3 009	3 012	0	17,69	105,0	0,00	80,58	-	-	0,00	0,00	-
4	2 903	2 905	0	18,18	105,0	0,00	80,26	-	-	0,00	0,00	-
5	2 675	2 678	0	19,28	105,0	0,00	79,56	-	-	0,00	0,00	-
6	2 425	2 428	0	20,59	105,0	0,00	78,71	-	-	0,00	0,00	-
7	2 229	2 232	0	21,70	105,0	0,00	77,98	-	-	0,00	0,00	-
8	1 971	1 975	0	23,30	105,0	0,00	76,91	-	-	0,00	0,00	-
9	1 590	1 595	0	26,01	105,0	0,00	75,05	-	-	0,00	0,00	-
Sum				33,07								

- Data undefined due to calculation with octave data

Project:

Paholammi /Neoen

Licensed user:

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Osmontie 34, PO Box 950
FI-00601 Helsinki
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Johanna Harju / johanna.harju@fcg.fi
Calculated:
30.11.2021 8.43/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_STE_HH169m

Noise calculation model:

ISO 9613-2 Finland

Wind speed (in 10 m height):

8,0 m/s

Ground attenuation:

General, Ground factor: 0,4

Meteorological coefficient, C0:

0,0 dB

Type of demand in calculation:

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

Noise values in calculation:

All noise values are mean values (Lwa) (Normal)

Pure tones:

Pure tones penalty is added to total noise impact at receptors

Noise sensitive area

Height above ground level, when no value in NSA object:

4,0 m; Don't allow override of model height with height from NSA object

Uncertainty margin:

0,0 dB; Uncertainty margin in NSA has priority

Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:

0,0 dB(A)

Octave data required

Frequency dependent air absorption

63	125	250	500	1 000	2 000	4 000	8 000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
0,10	0,38	1,12	2,36	4,08	8,78	26,60	95,00

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89

WTG: NORDEX N117/2400 2400 116.8 !O!

Noise: Level 0 - 105.0dB(A) Kirkkokallio

Source Source/Date Creator Edited
 NORDEX 16.4.2014 USER 19.10.2021 13.38
 F008_146_A07_EN
 Revision 00
 2014-04-16

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	120,0	8,0	105,0	No	85,3	90,9	96,1	98,1	99,5	98,9	95,1	83,5

WTG: NORDEX N131/3000 3000 131.0 !O!

Noise: Level - 106 dB(A) - R00

Source Source/Date Creator Edited
 NORDEX 11.3.2014 USER 20.10.2021 12.36
 F008_246_A07_EN
 Revision 01
 2014-03-11

Octave data

Status	Hub height	Wind speed	LwA,ref	Pure tones	63	125	250	500	1000	2000	4000	8000
	[m]	[m/s]	[dB(A)]		[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]	[dB]
From Windcat	144,0	8,0	106,0	No	84,4	91,5	96,3	97,9	100,8	99,7	97,3	87,2

Project:

Paholammi /Neoen

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Johanna Harju / johanna.harju@fcg.fi
Calculated:
30.11.2021 8.43/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_STE_HH169m

WTG: VESTAS V162-6.0 HH169 6000 162.0 !O!

Noise: V162 - 6.0 MW Mode 0 STE - 10-2020

Source	Source/Date	Creator	Edited
Vestas	26.10.2019	USER	30.11.2021 8.42

DMS no.: 0095-3732_00

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	169,0	8,0	104,3	No	84,1	91,9	96,9	99,2	98,7	95,4	89,4	80,4

Noise sensitive area: A Asuinrakennus A

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: B Asuinrakennus B

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: C Asuinrakennus C

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: D Asuinrakennus D

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: E Asuinrakennus E

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: F Asuinrakennus F

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Project:

Paholammi /Neoen

Licensed user:

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FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 8.43/3.4.388

DECIBEL - Assumptions for noise calculation

Calculation: Melu_Paholammi_6 X V162_STE_HH169m

Noise sensitive area: G Asuinrakennus G

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: H Asuinrakennus H

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: I Asuinrakennus I

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: J Asuinrakennus J

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Noise sensitive area: K Asuinrakennus K

Predefined calculation standard:

Immission height(a.g.l.): Use standard value from calculation model

Uncertainty margin: Use default value from calculation model

Noise demand: 40,0 dB(A)

No distance demand

Pure tone penalty: 0 dB

Project:

Paholammi /Neoen

Licensed user:

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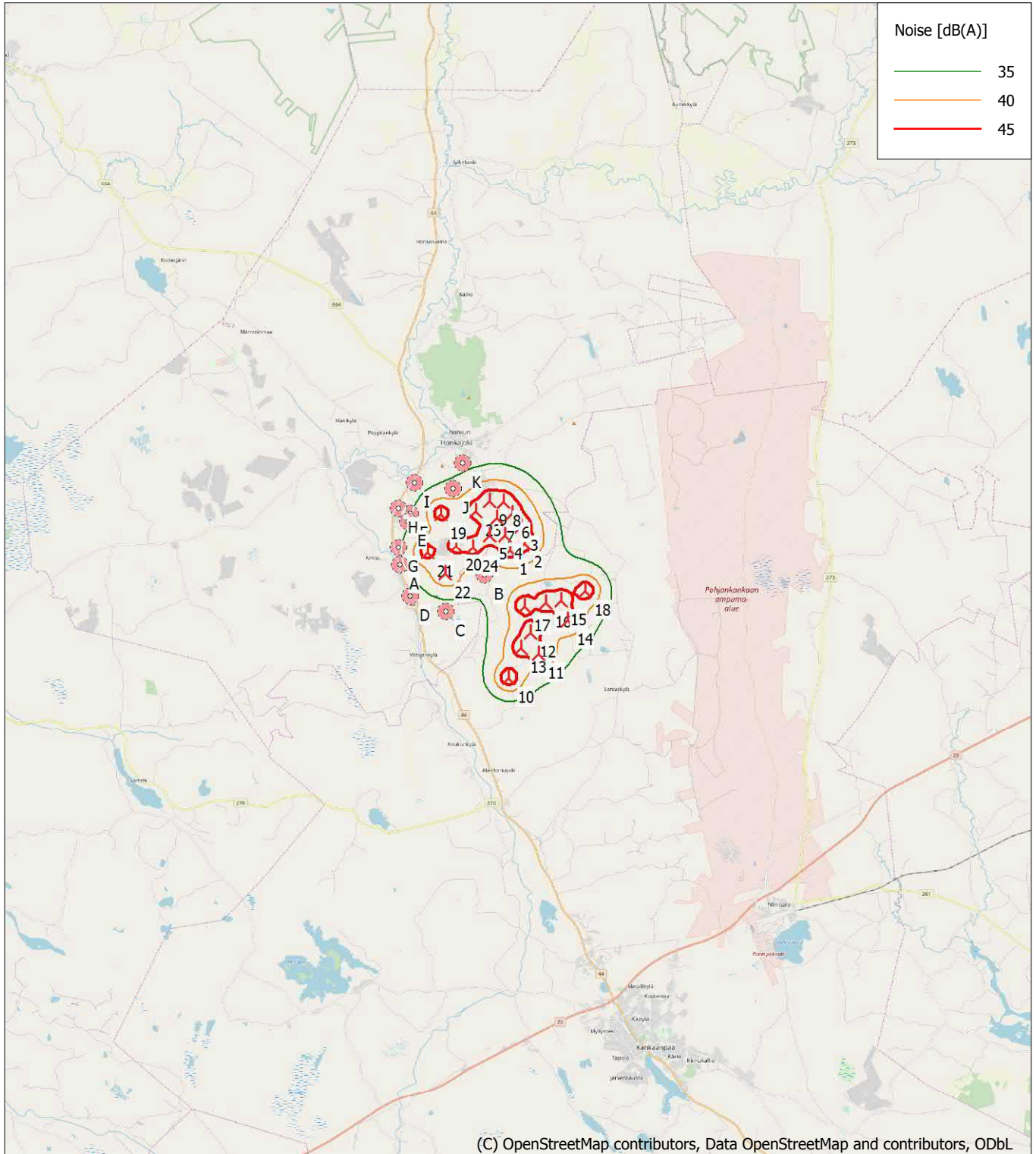
Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 8.43/3.4.388

DECIBEL - Map 8,0 m/s

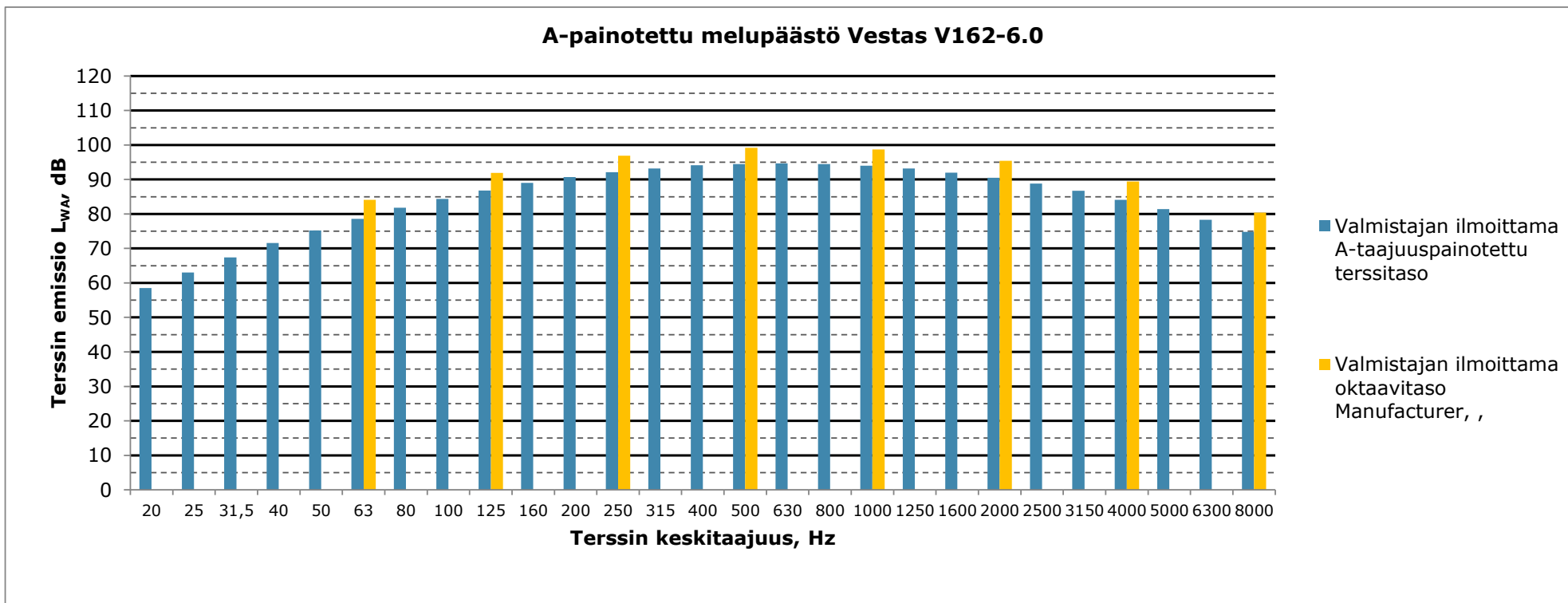
Calculation: Melu_Paholammi_6 X V162_STE_HH169m

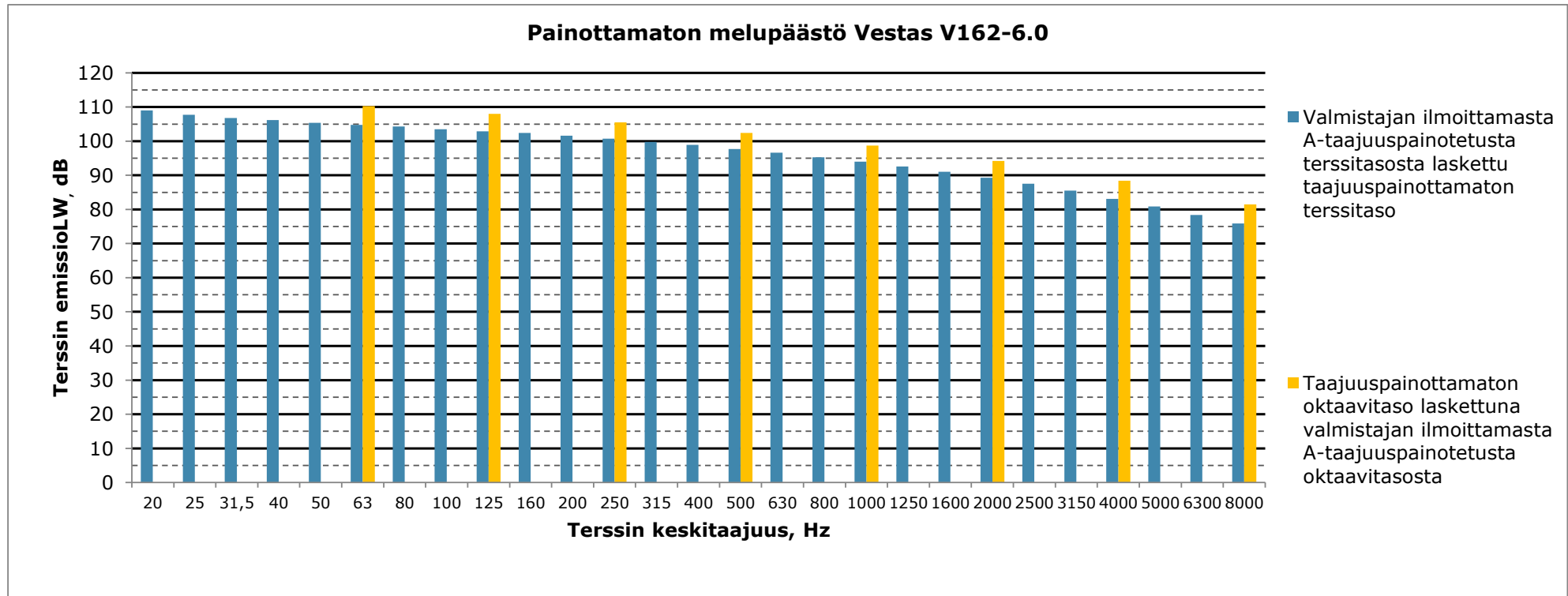


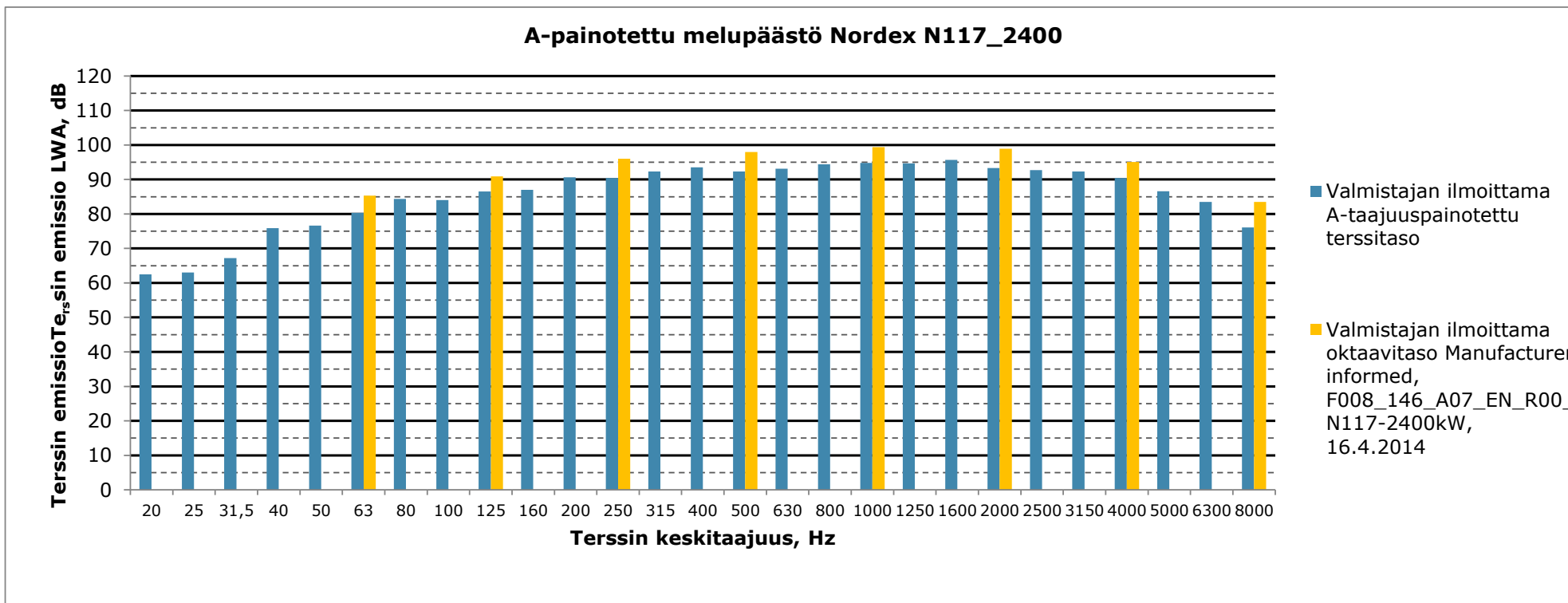
Map: EMD OpenStreetMap , Print scale 1:200 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 434 North: 6 877 207
 🚧 New WTG 🏠 Noise sensitive area
 Noise calculation model: ISO 9613-2 Finland. Wind speed: 8,0 m/s
 Height above sea level from active line object

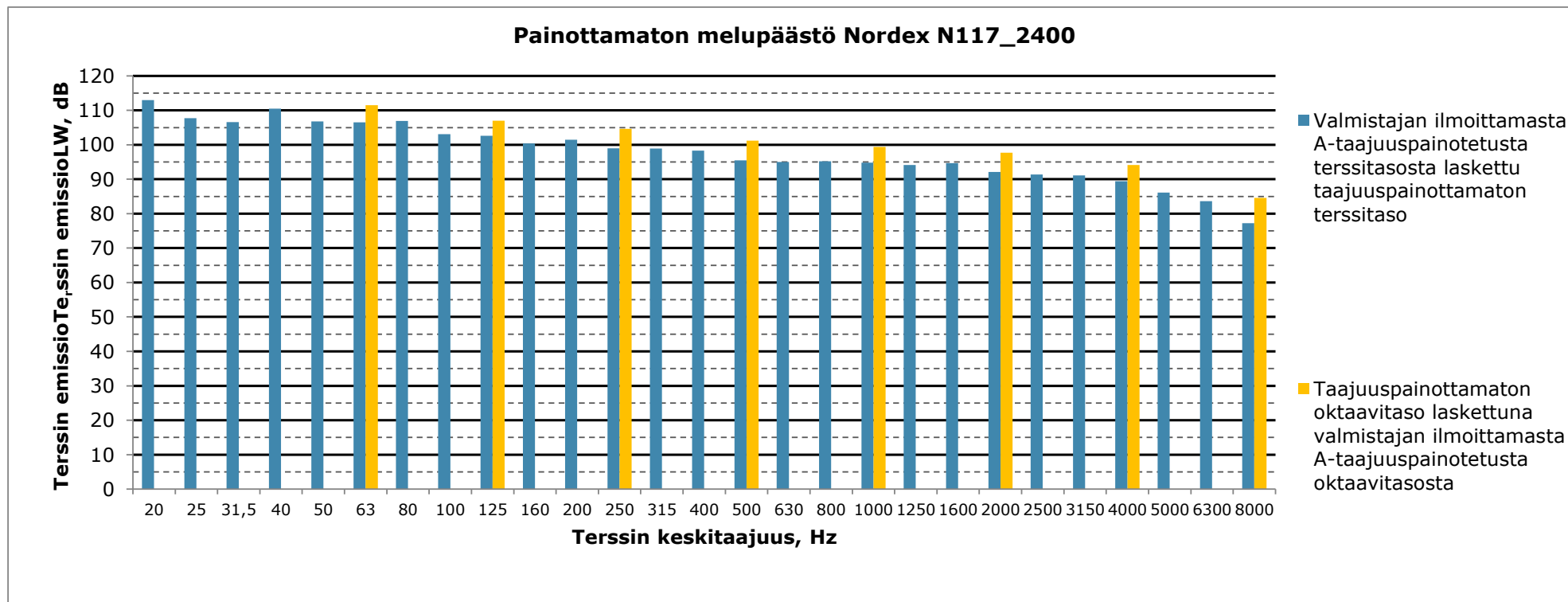
21.12.2021

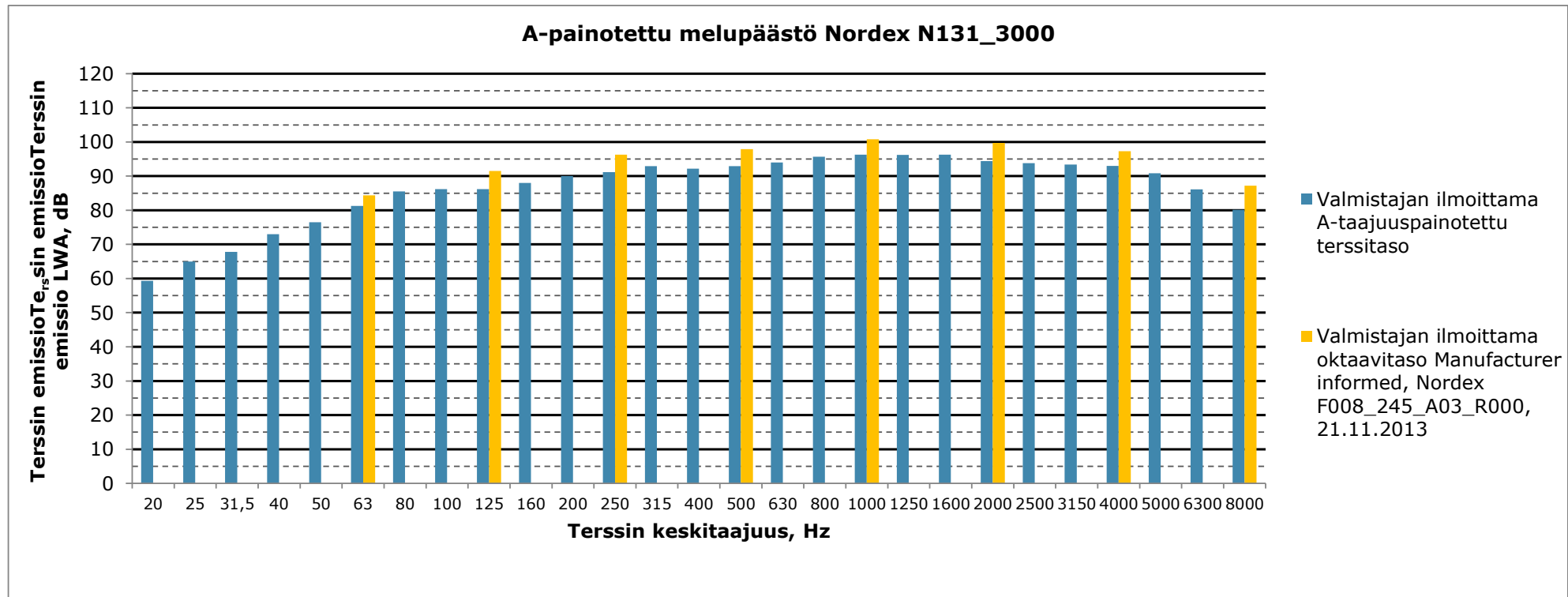
Liite 2: Matalataajuisen melun rakennuskohtaiset arvot

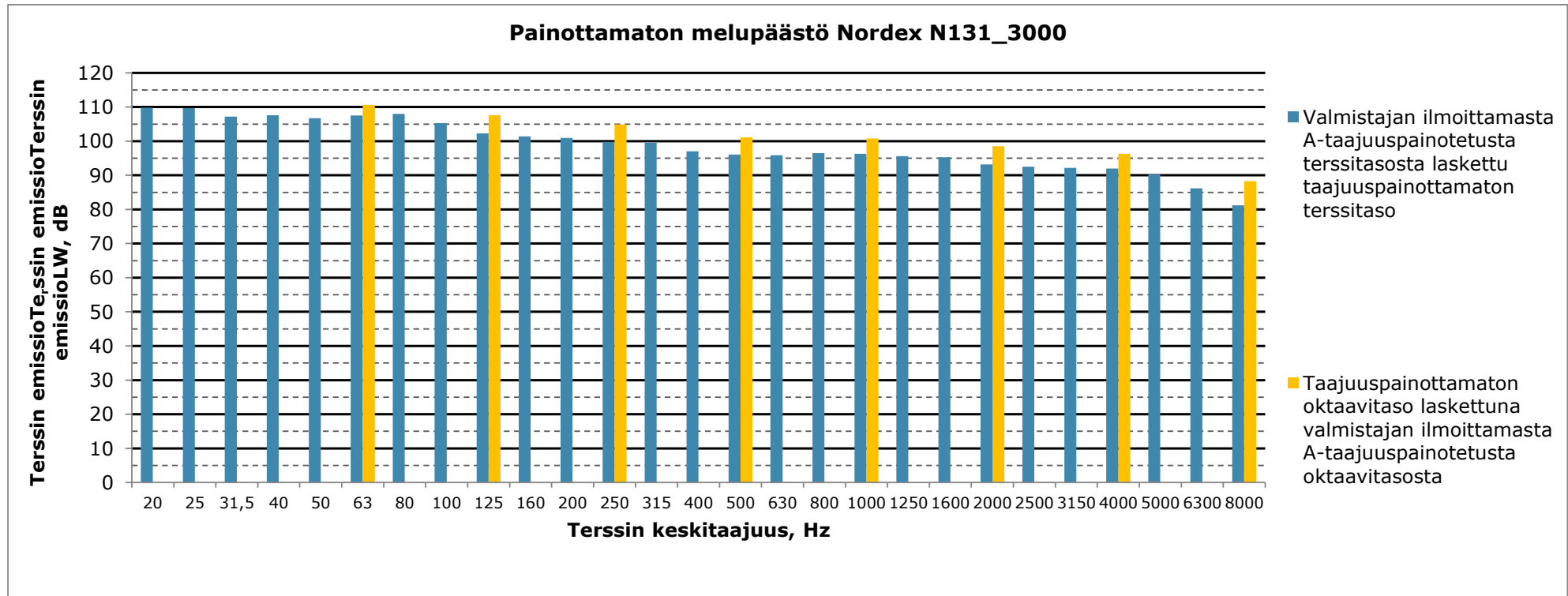




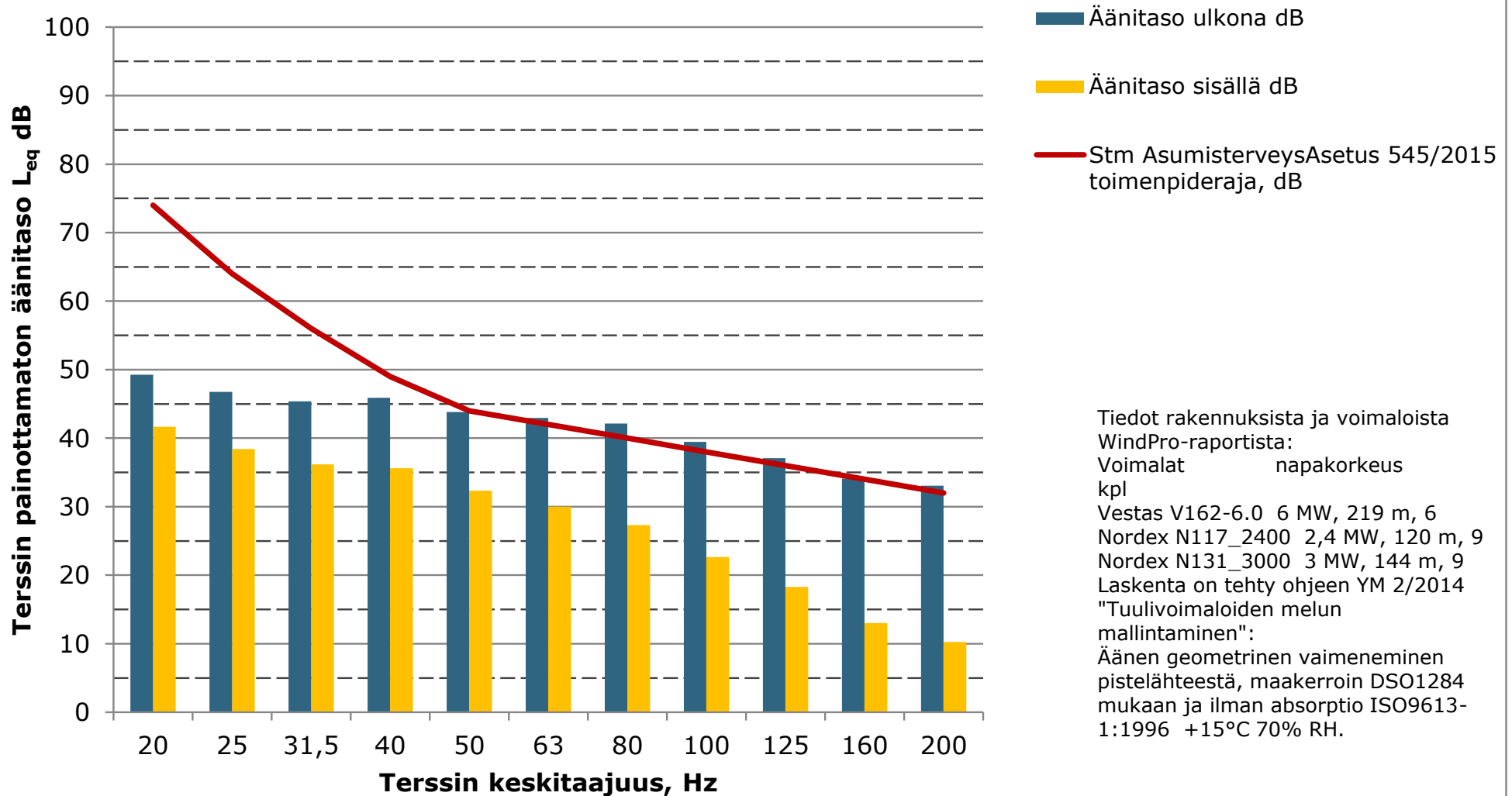


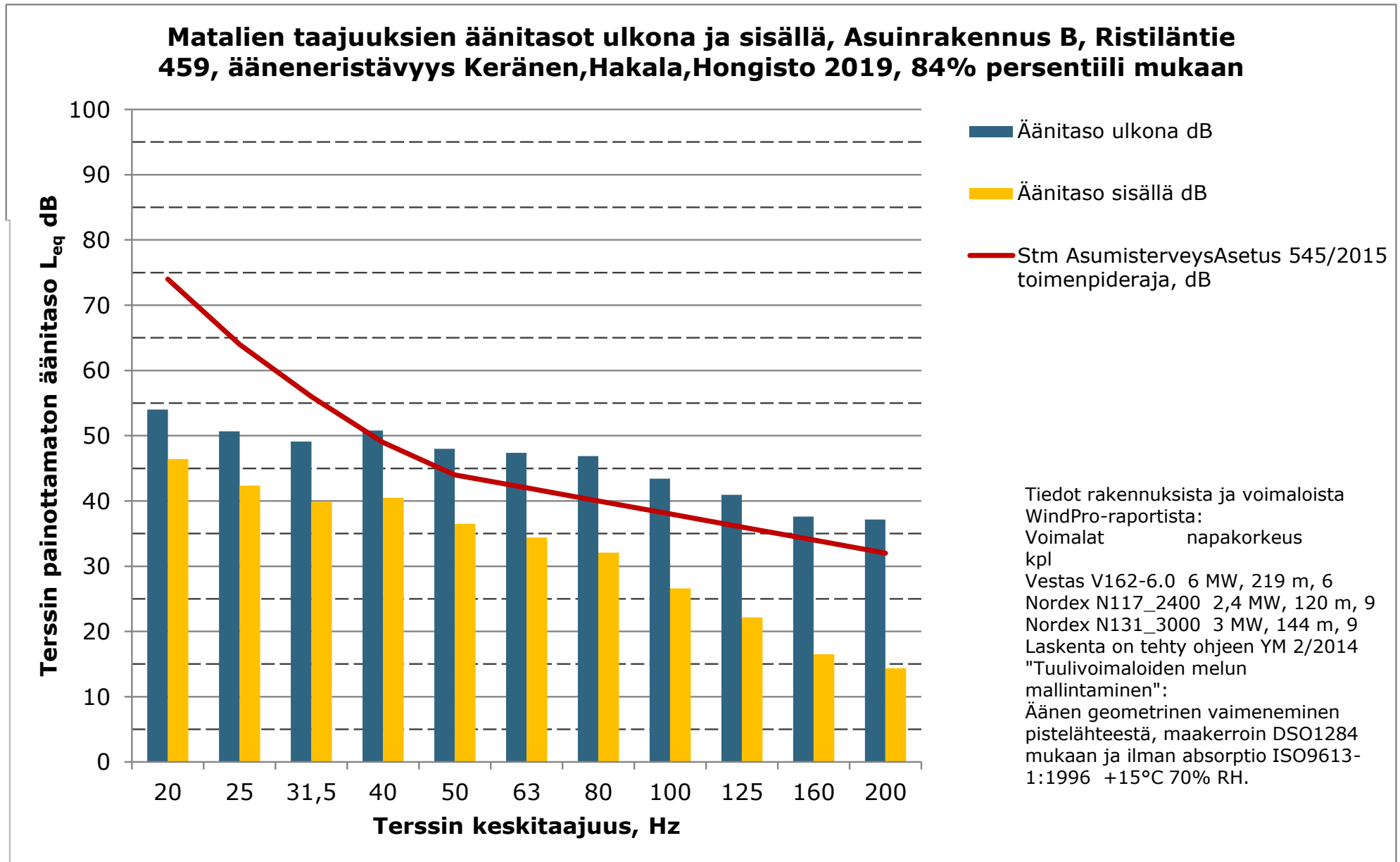


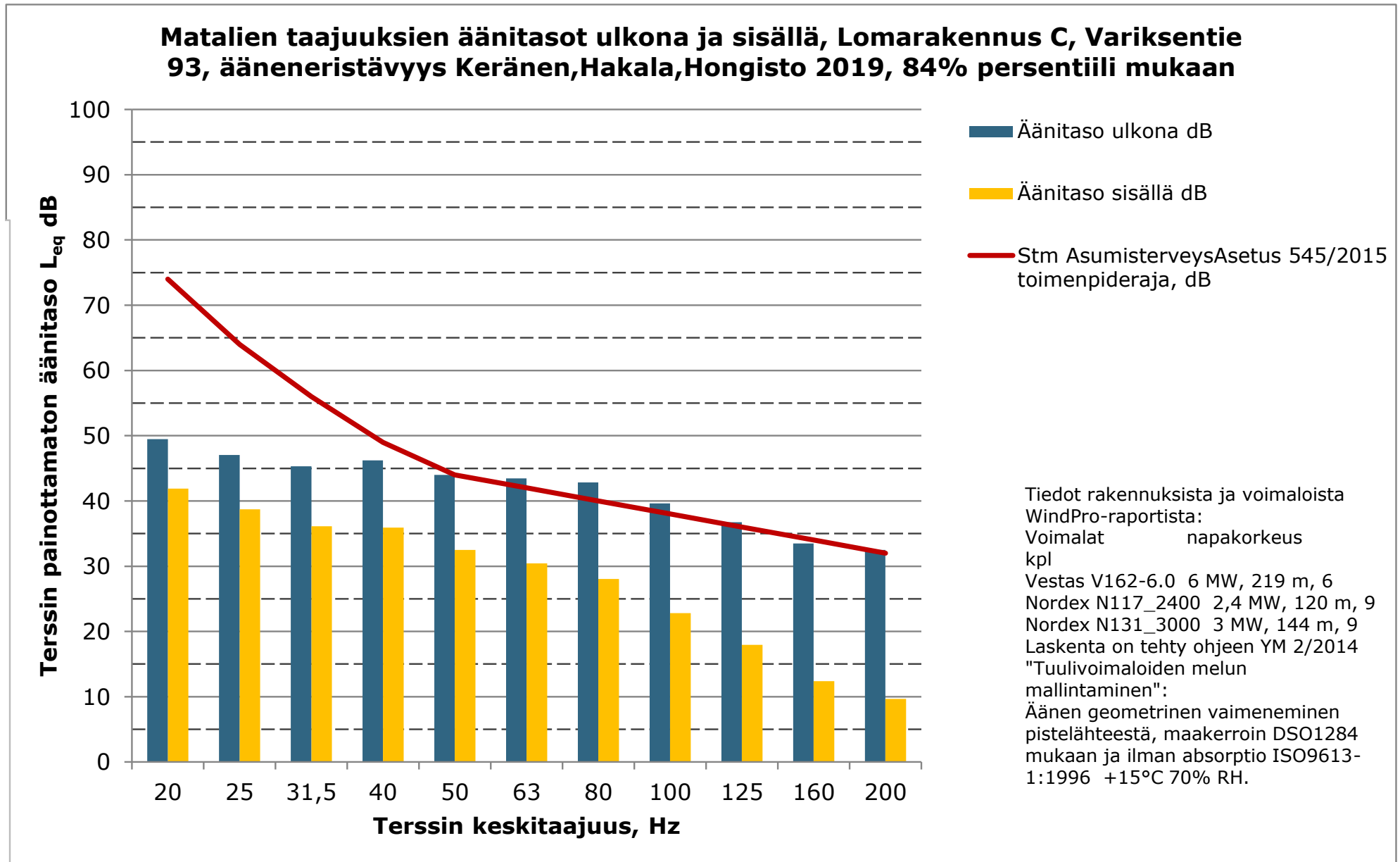




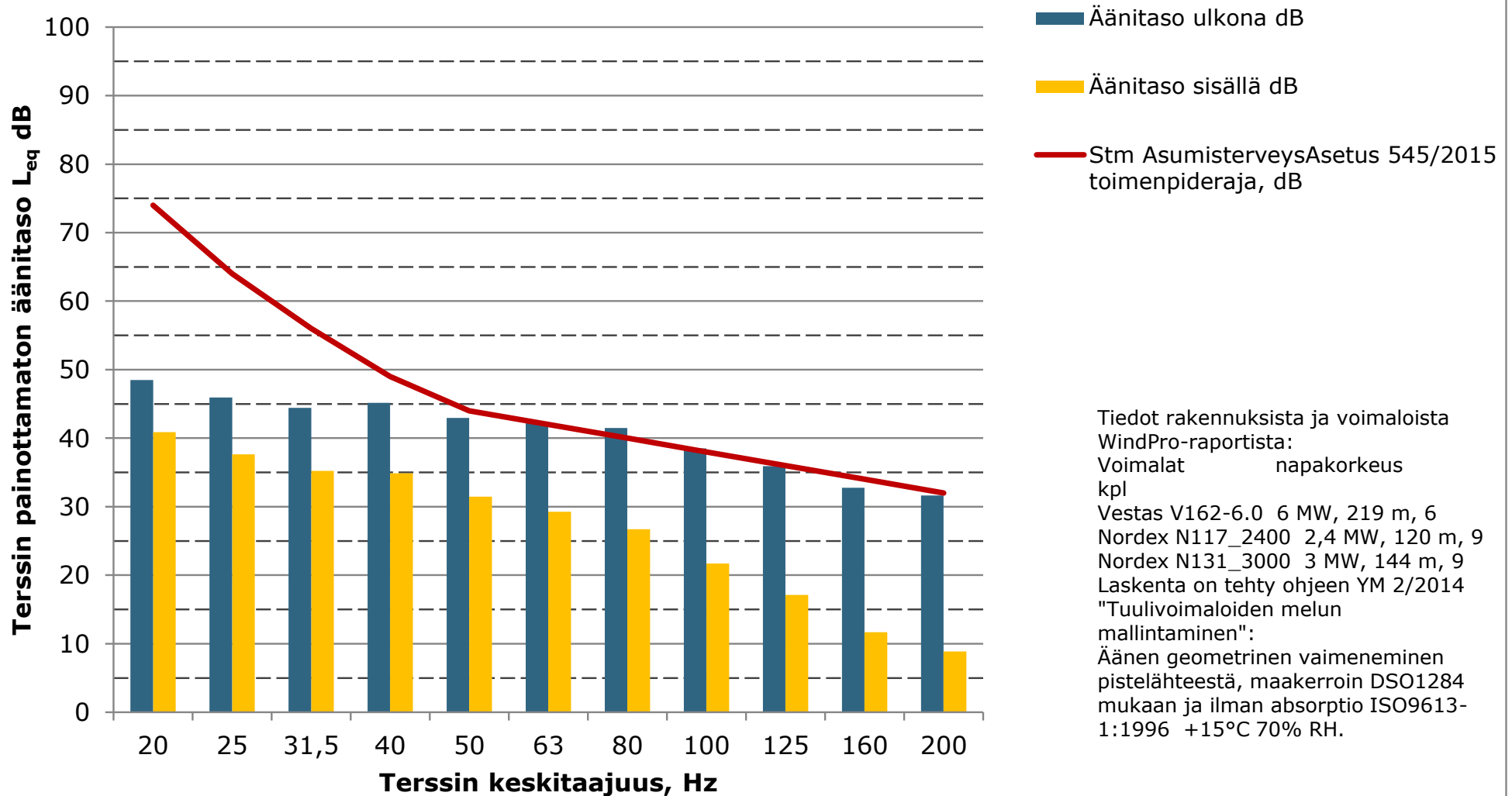
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus A,
Kankaanpääntie 534, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**

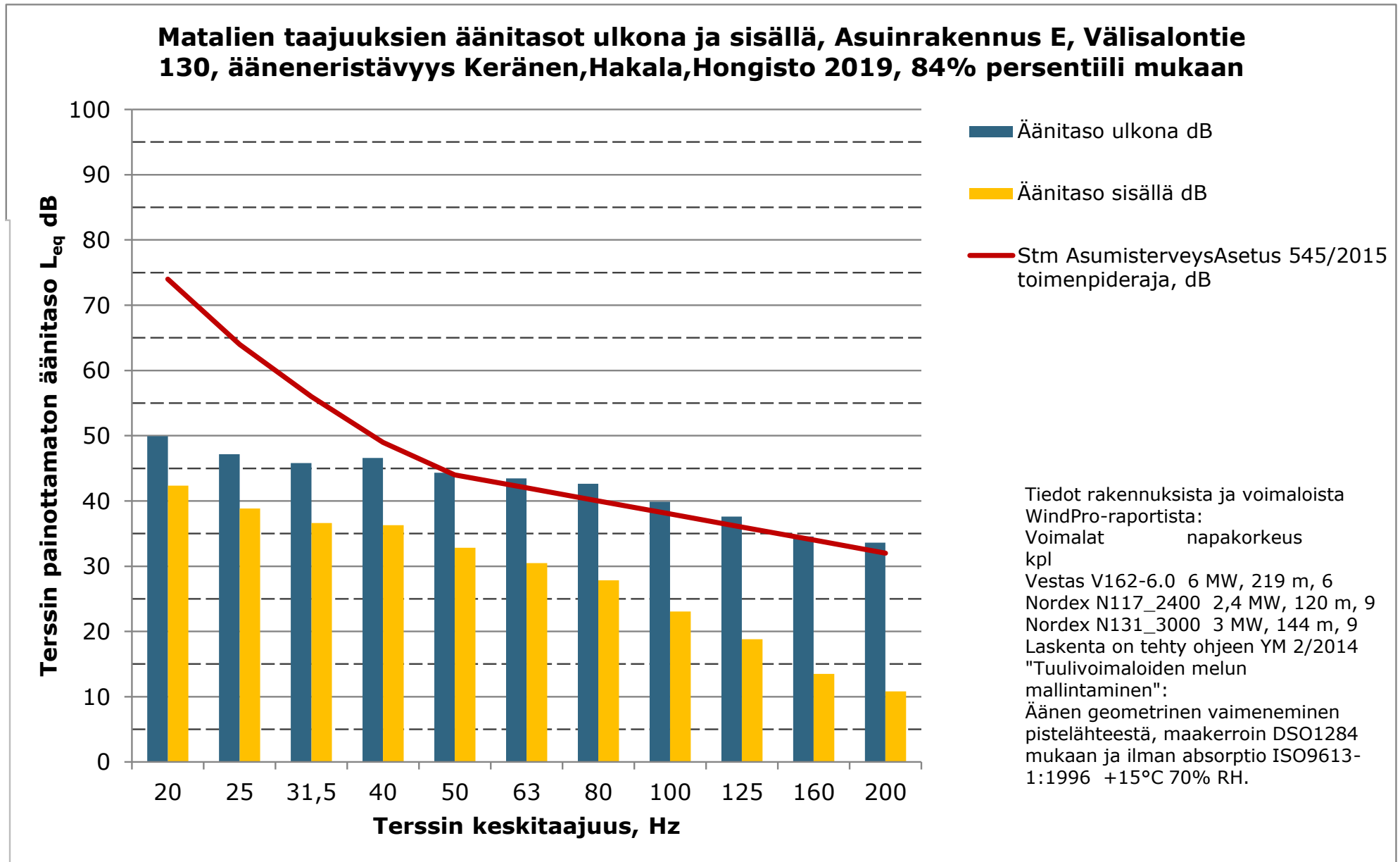


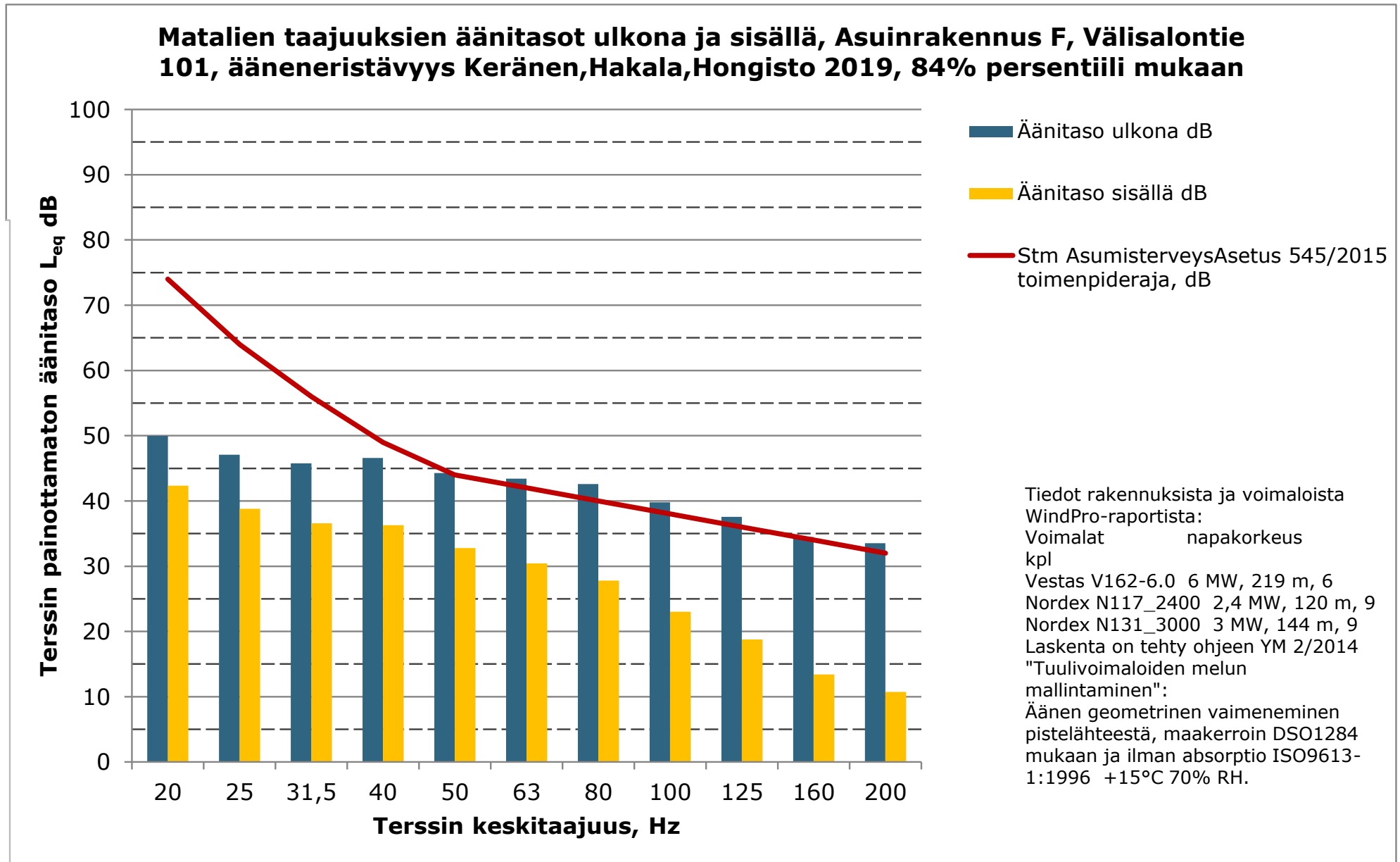




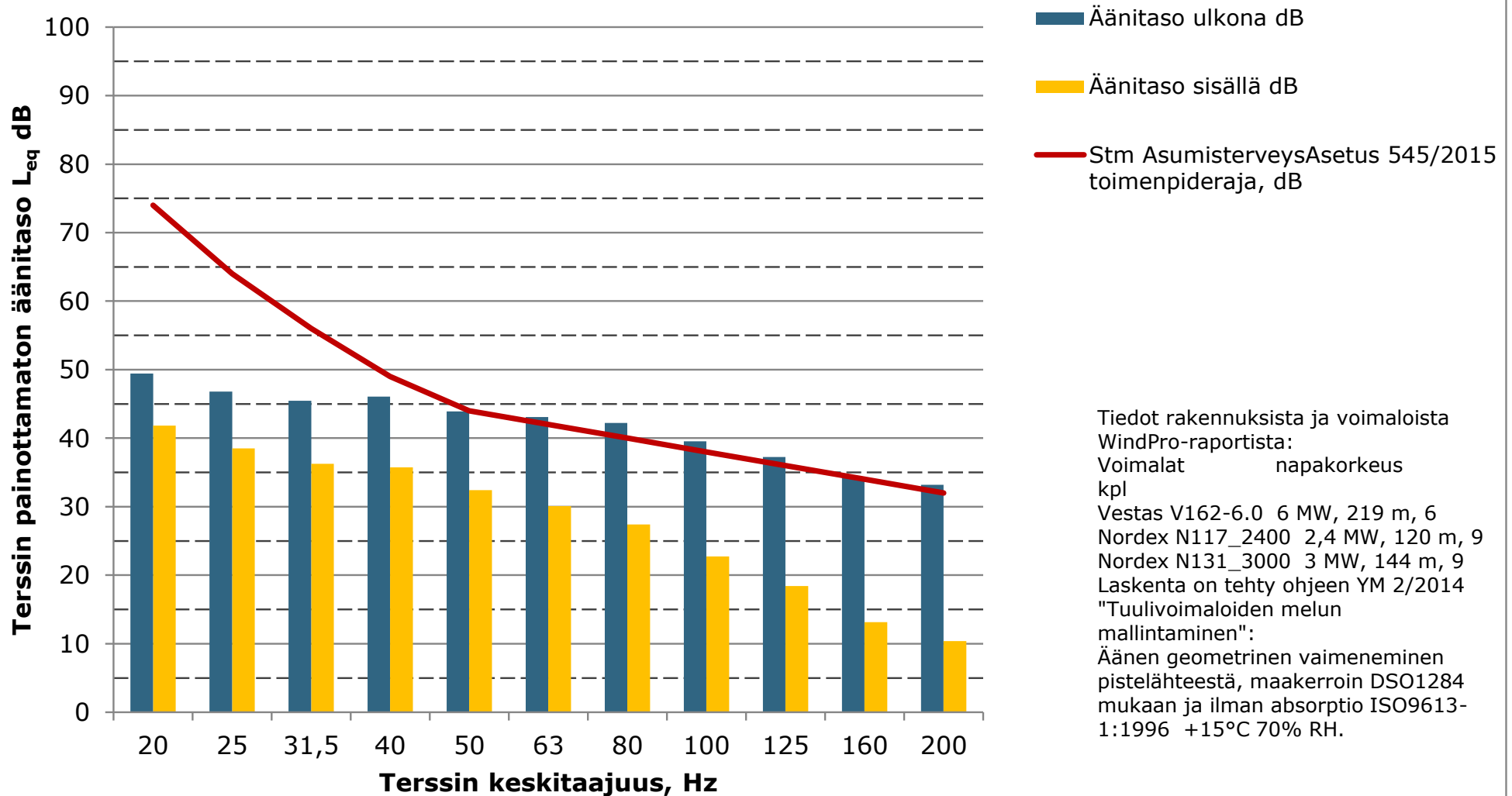
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus D,
Kankaanpääntie 646, ääneneristävyys Keränen,Hakala,Hongisto 2019, 84%
persentiili mukaan**



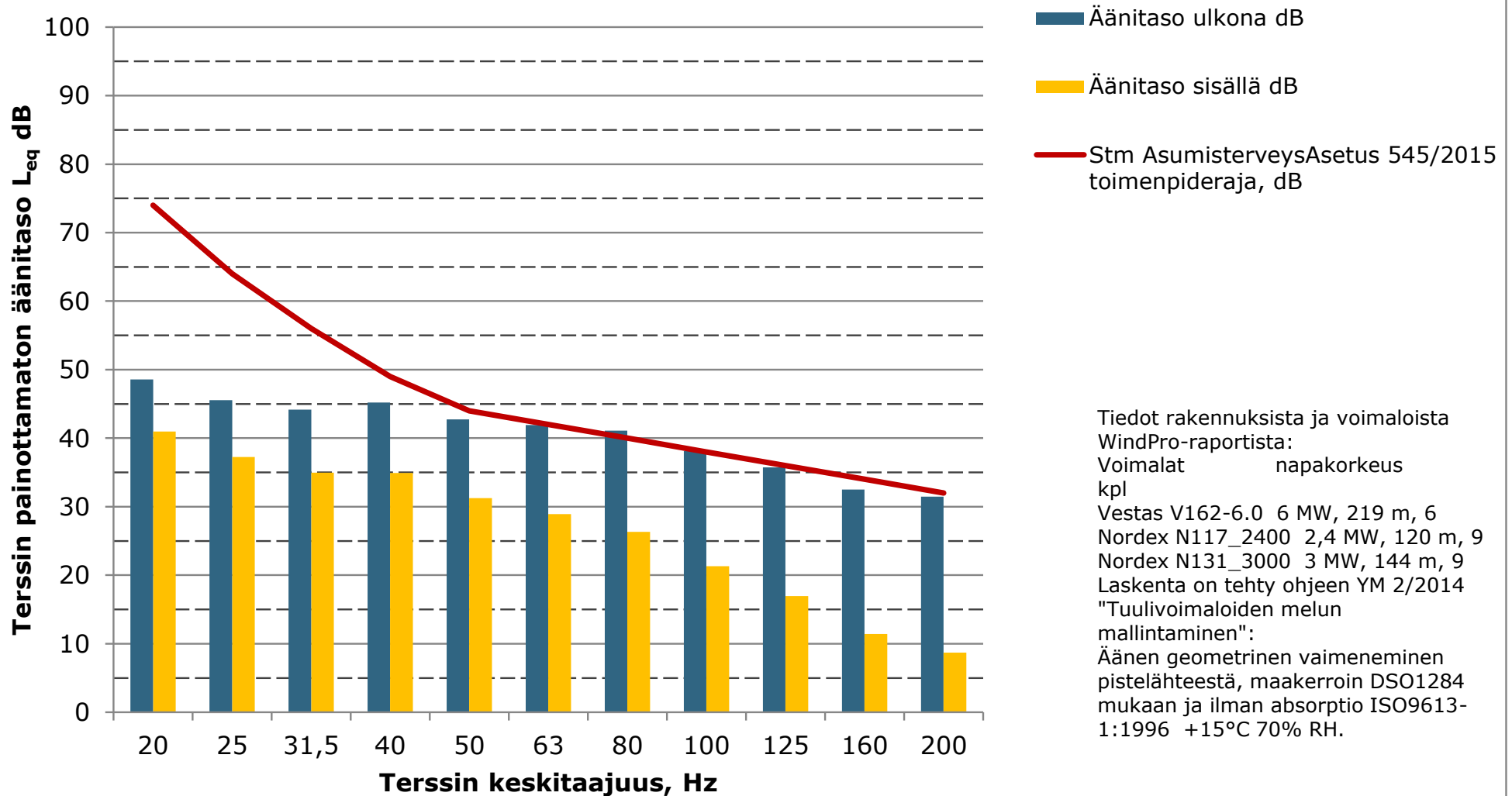




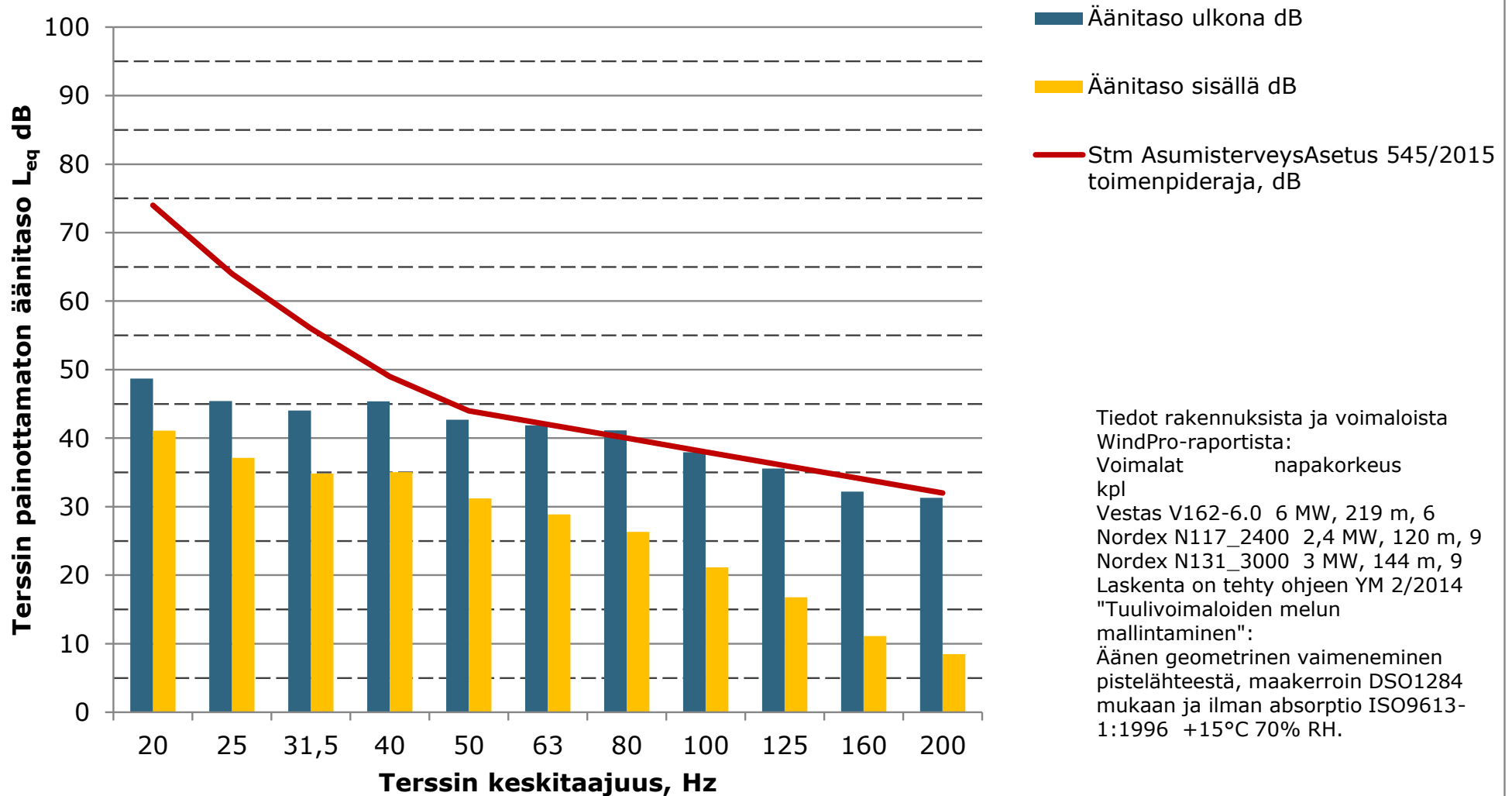
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus G,
Kankaanpääntie 468, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



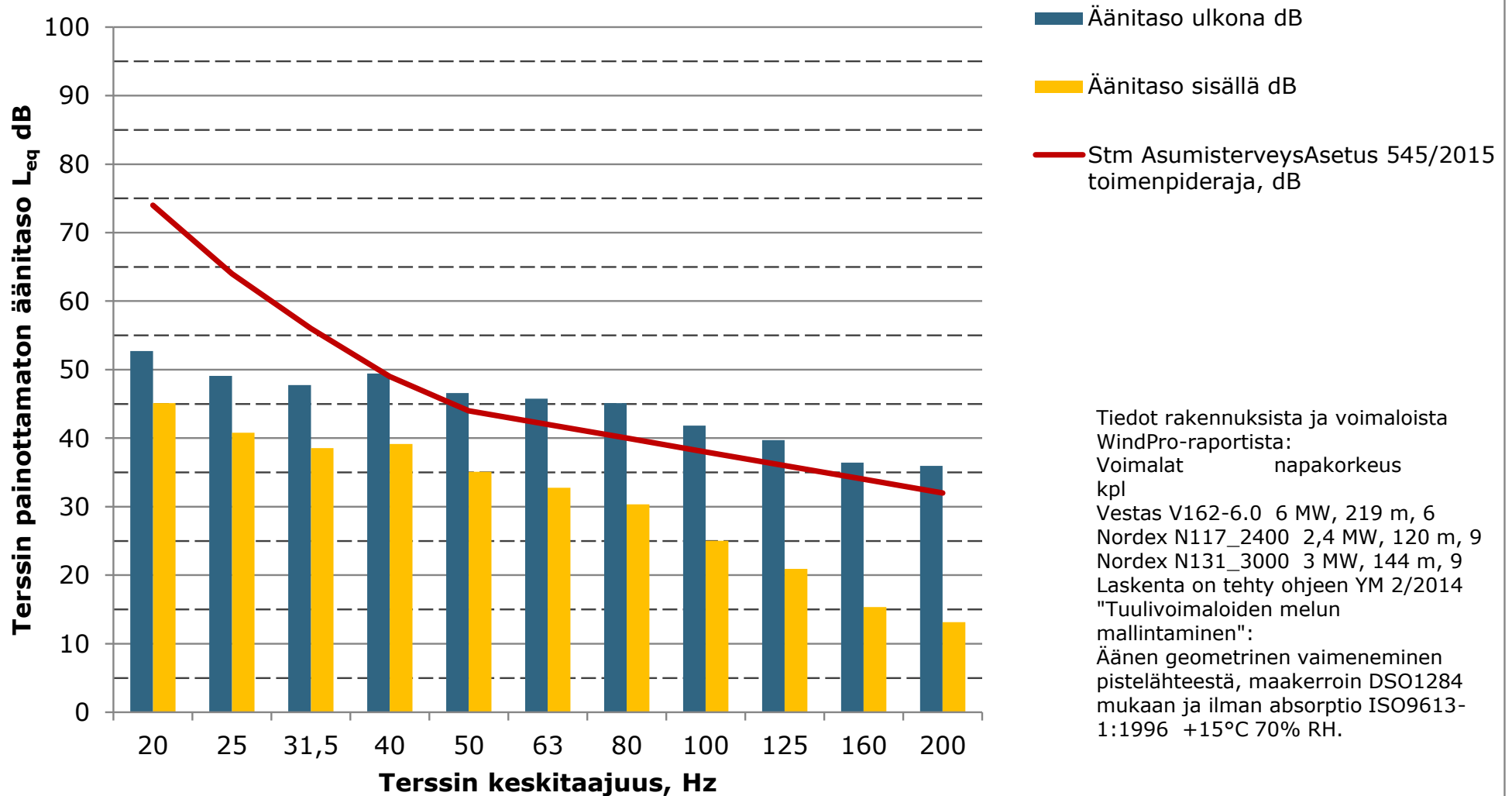
**Matalien taajuuksien äänitasot ulkona ja sisällä, Lomarakennus H,
Kankaanpääntie 320, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



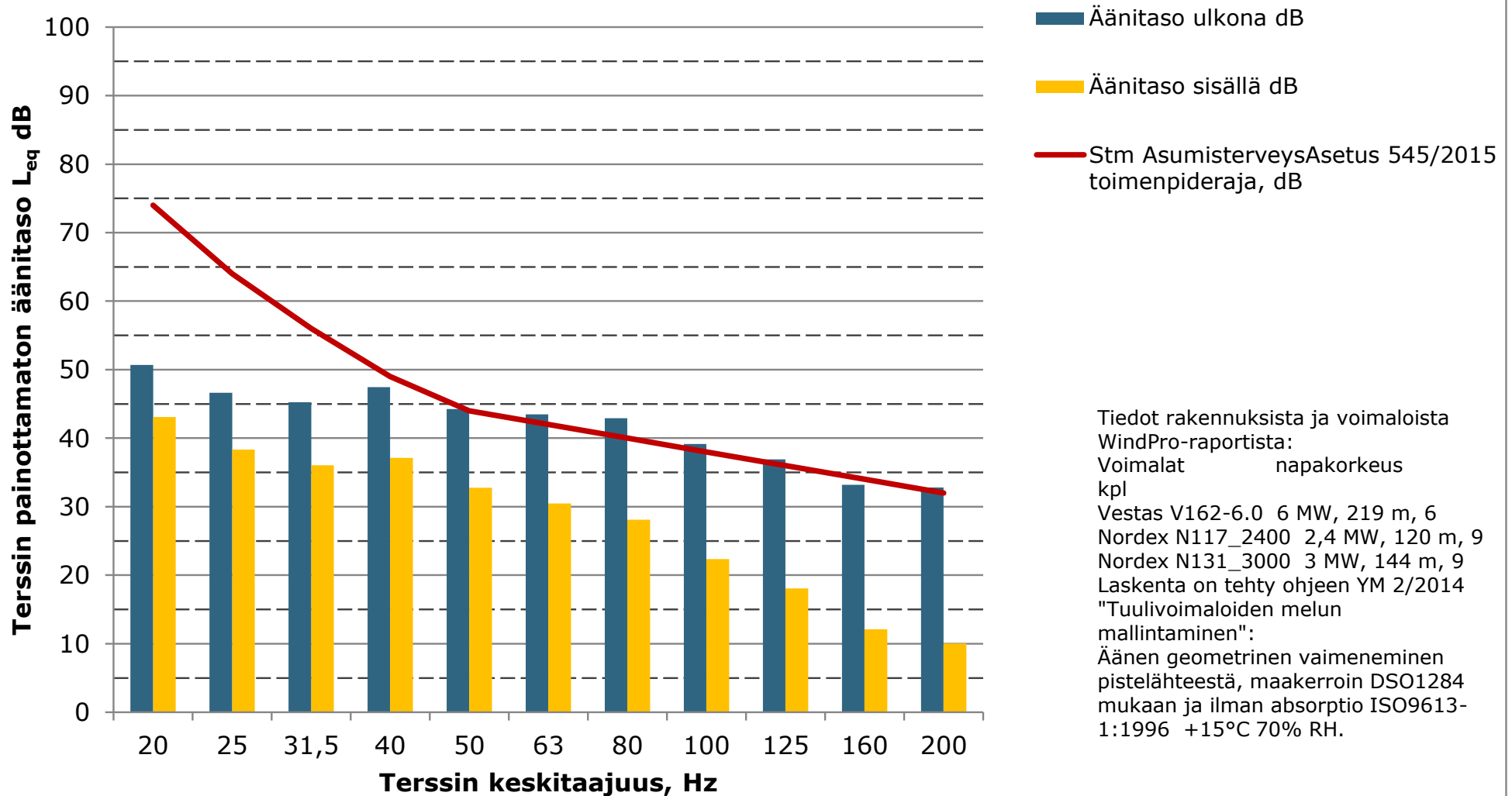
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus I,
Kankaanpääntie 218, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**

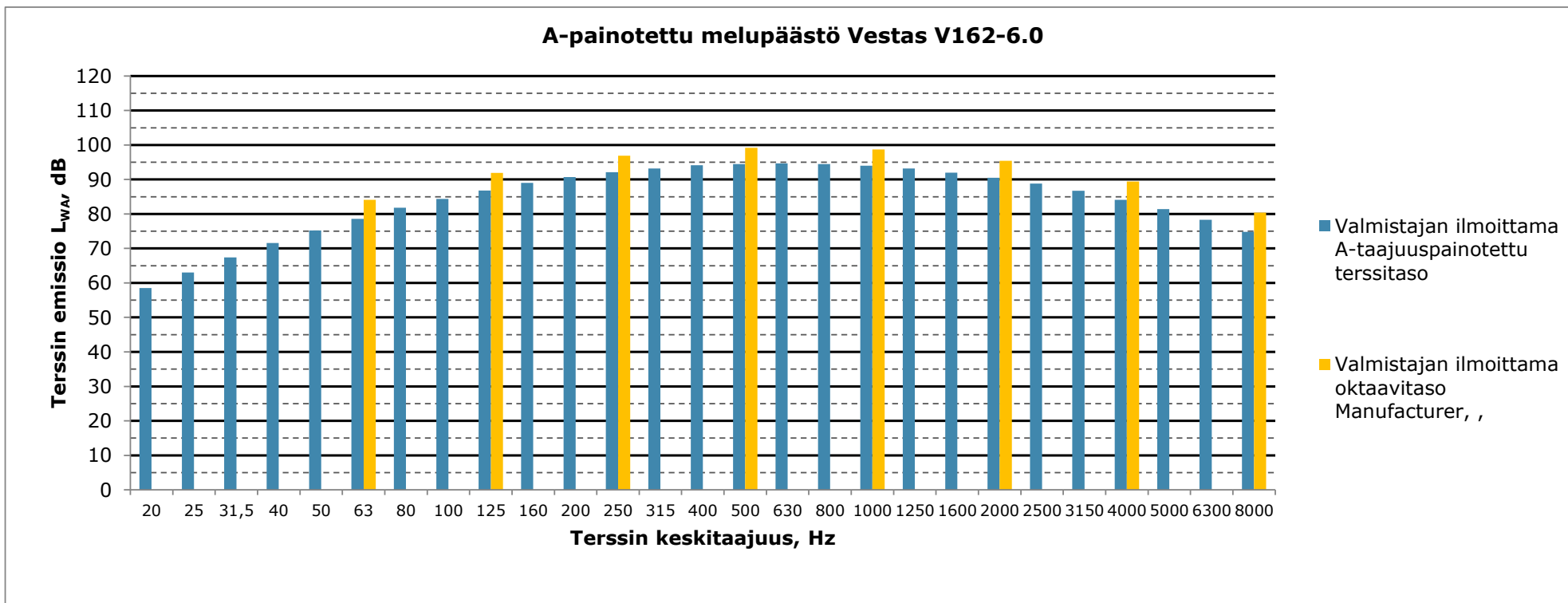


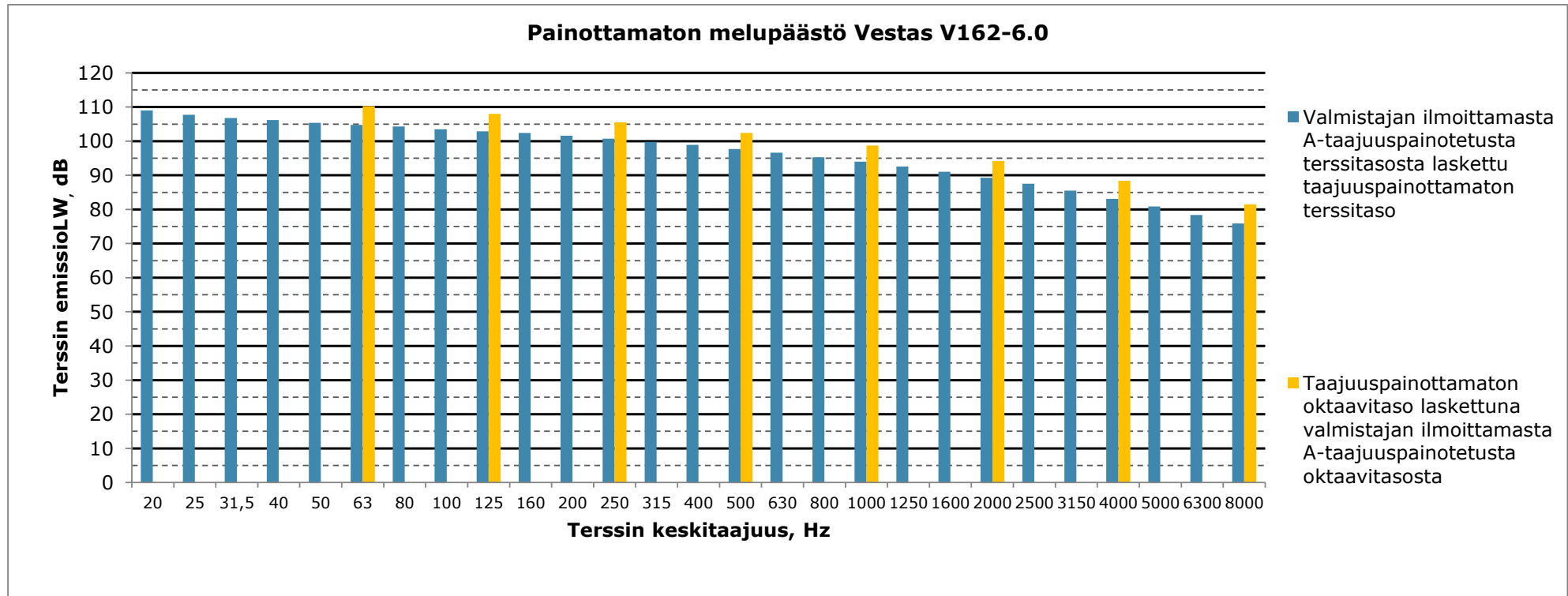
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus J,
Penkkinevantie 85, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**

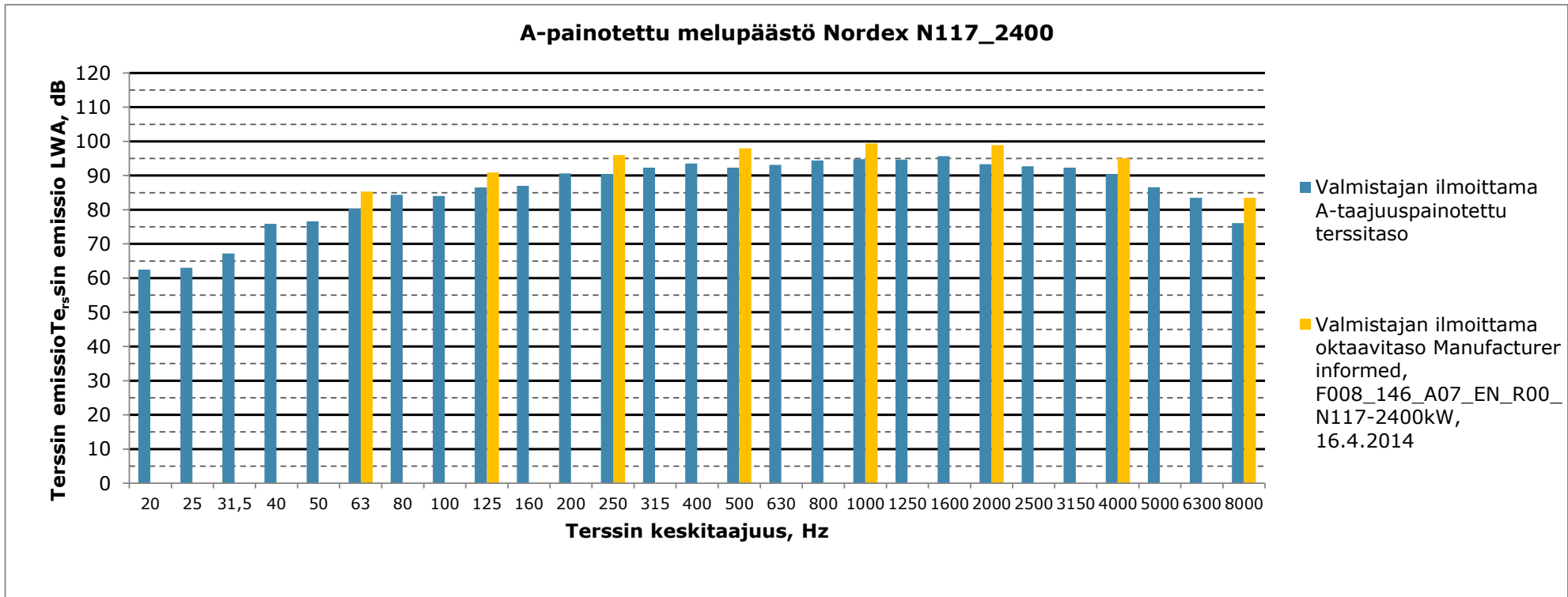


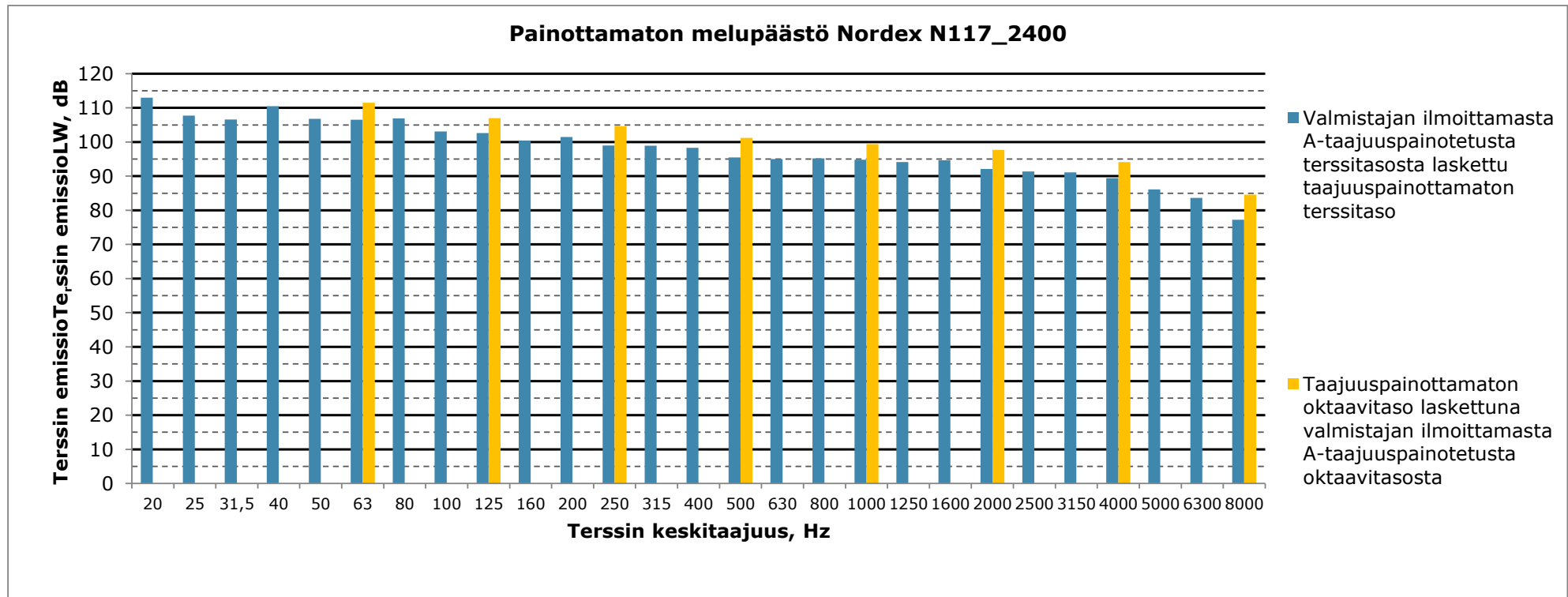
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus K,
Seppäkoskentie 36, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**

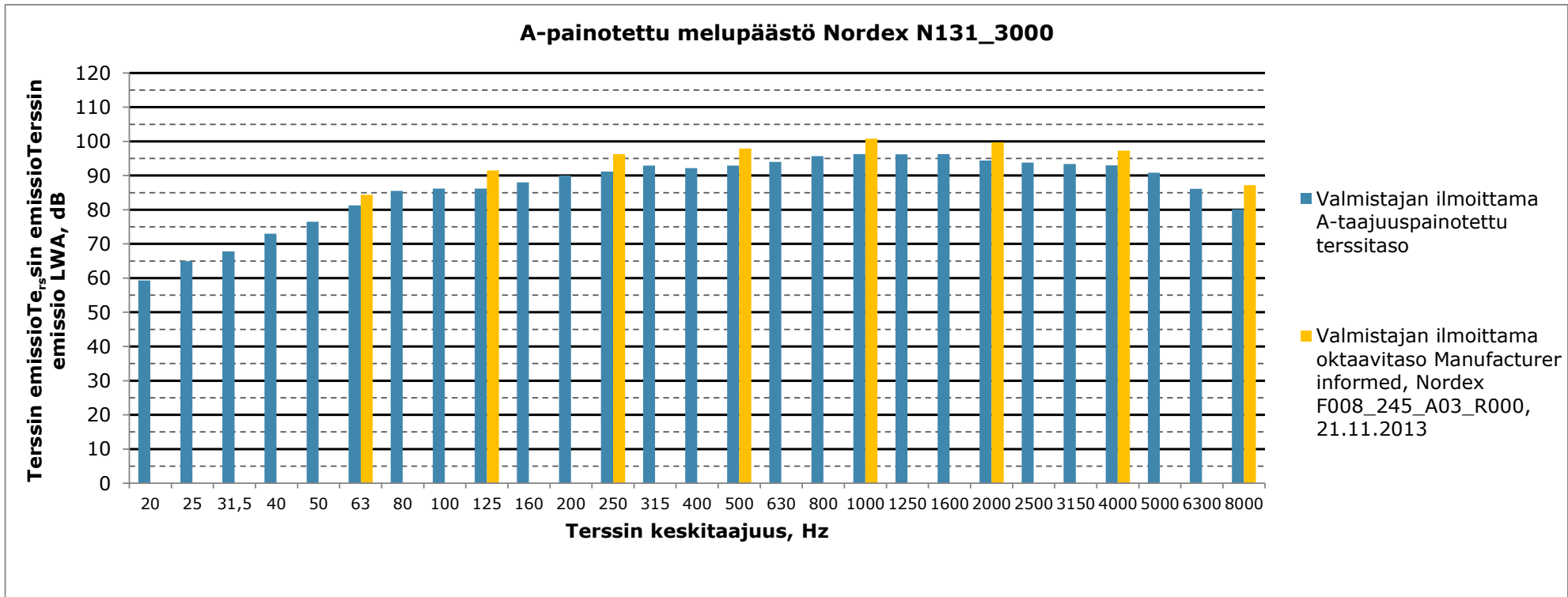


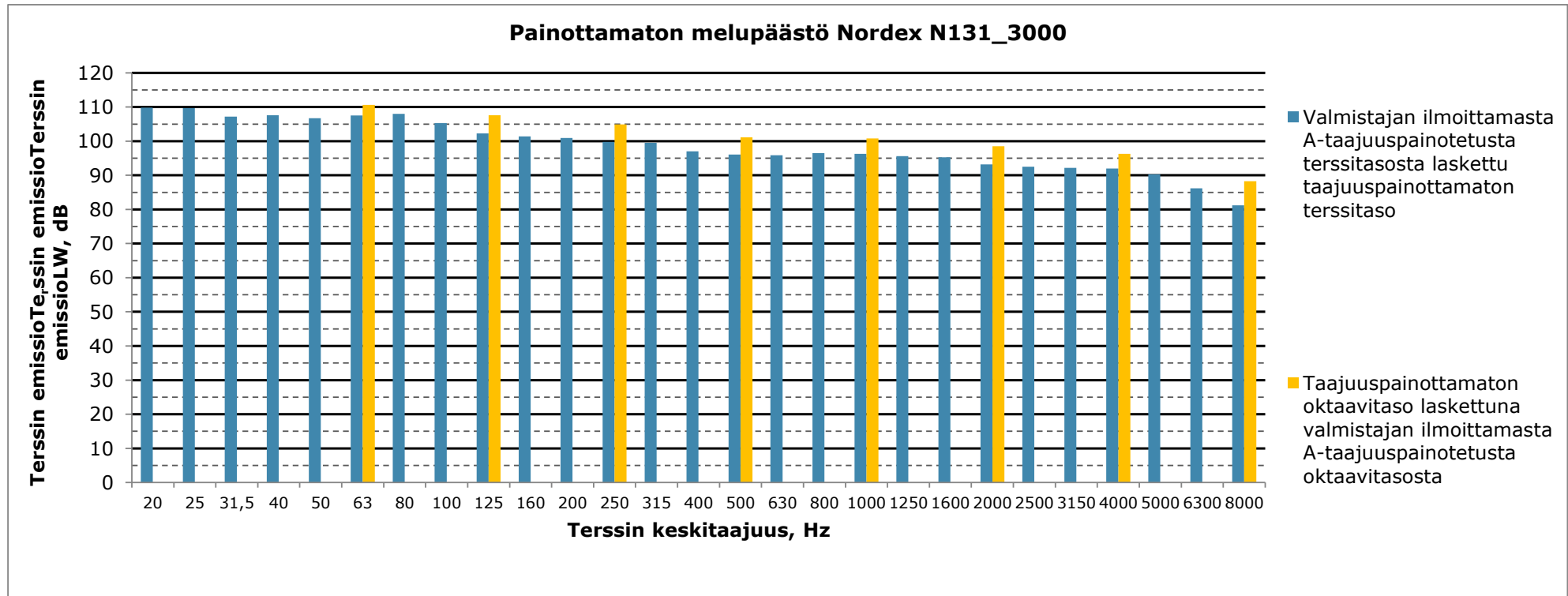




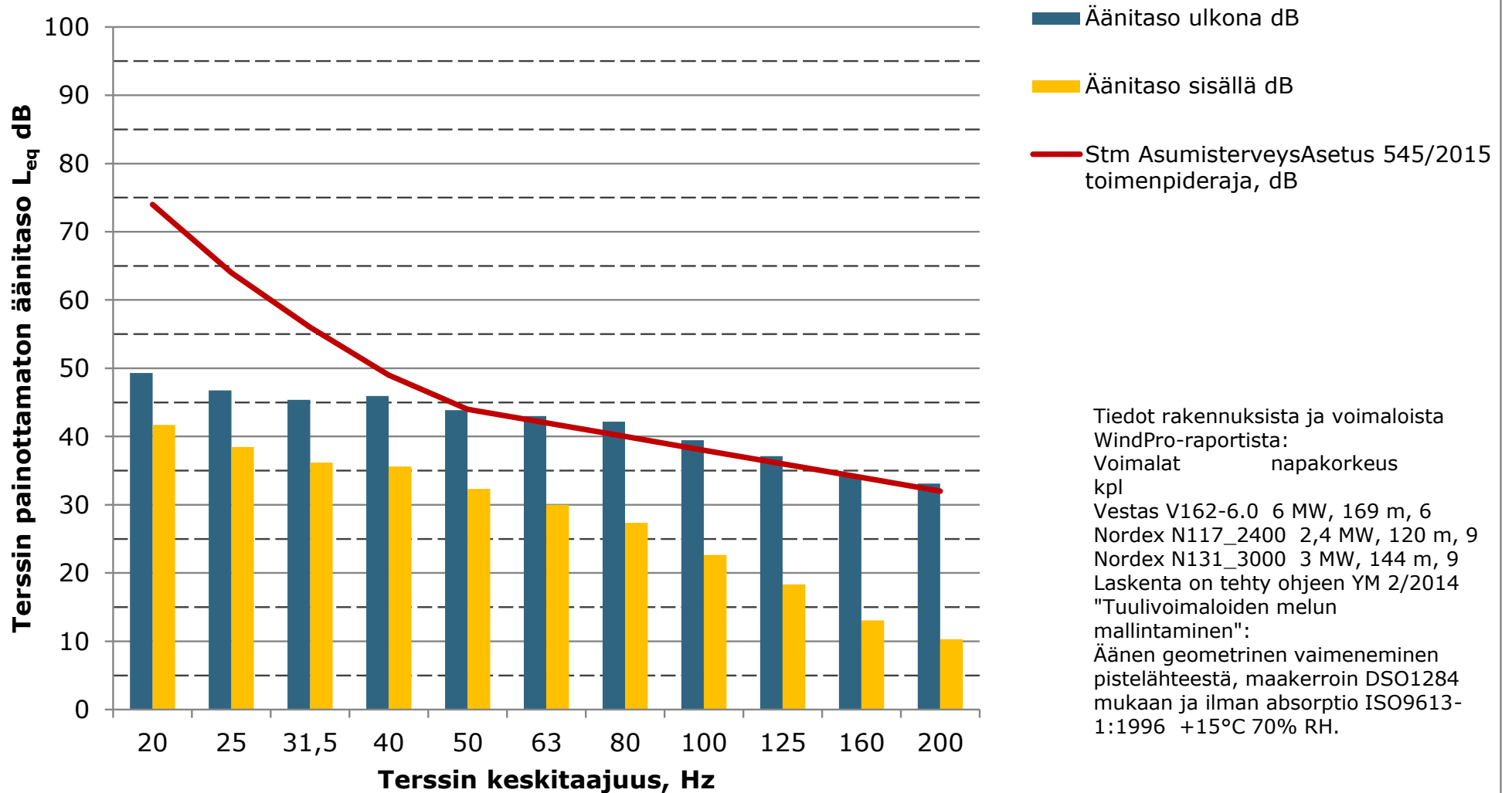


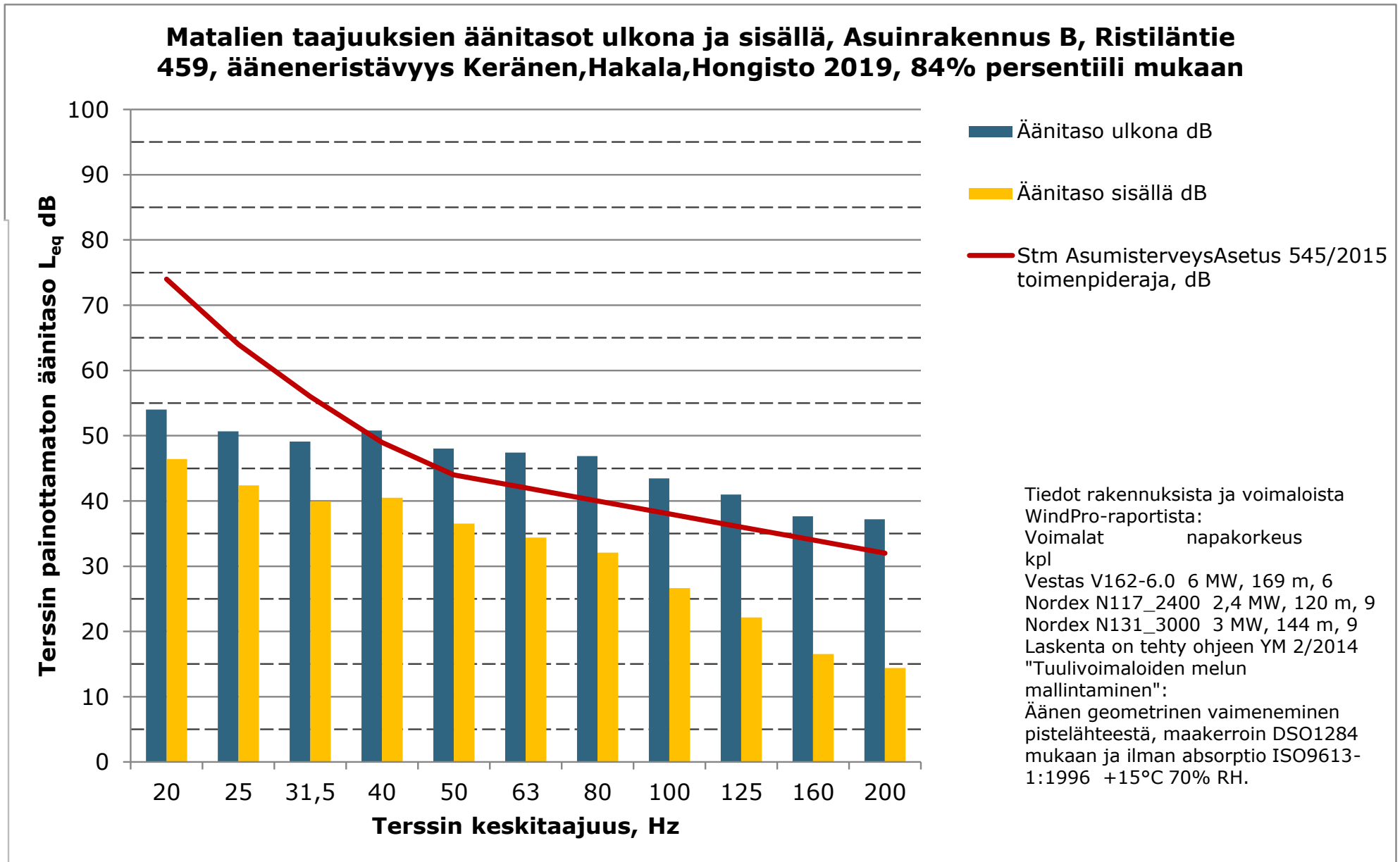


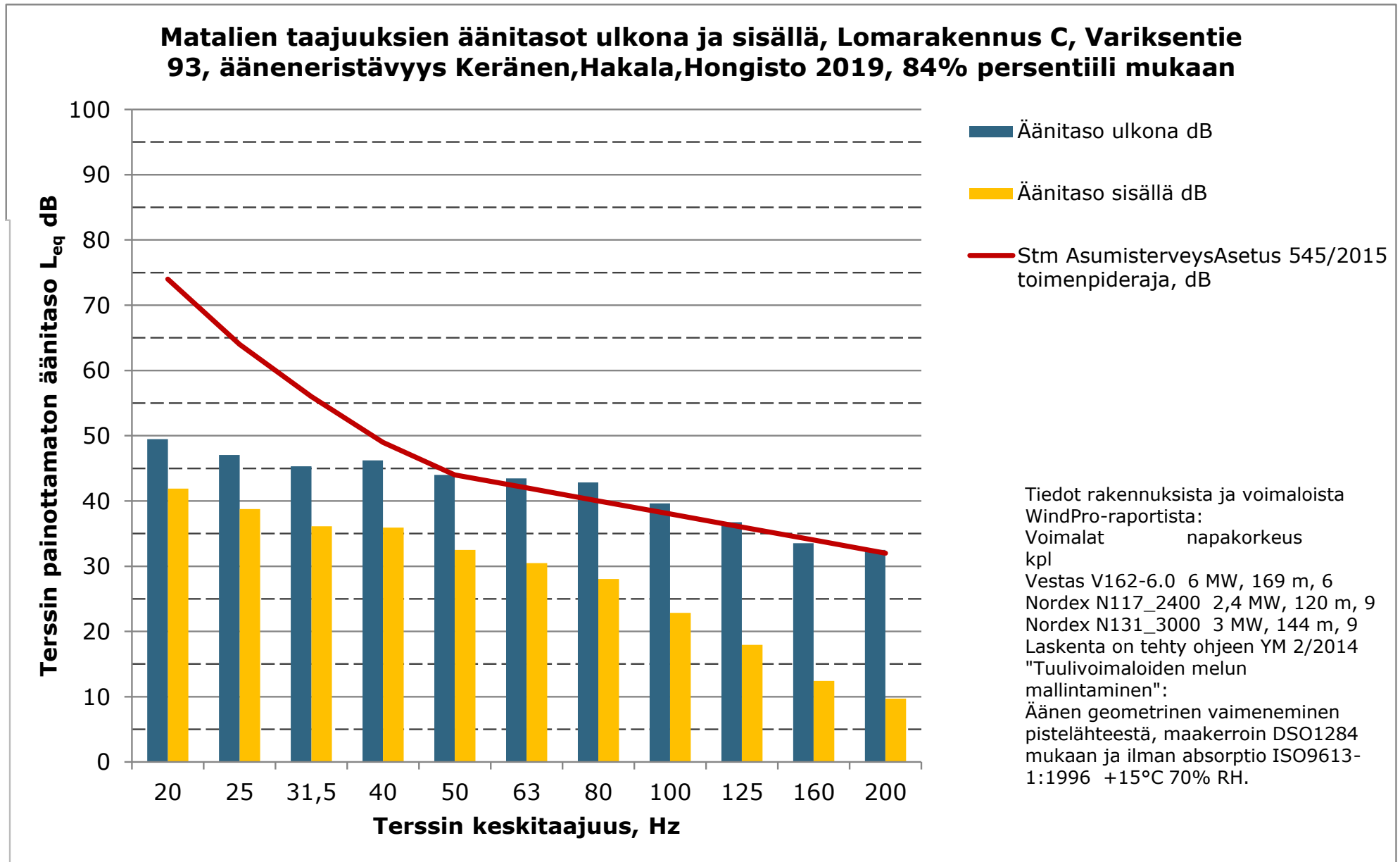




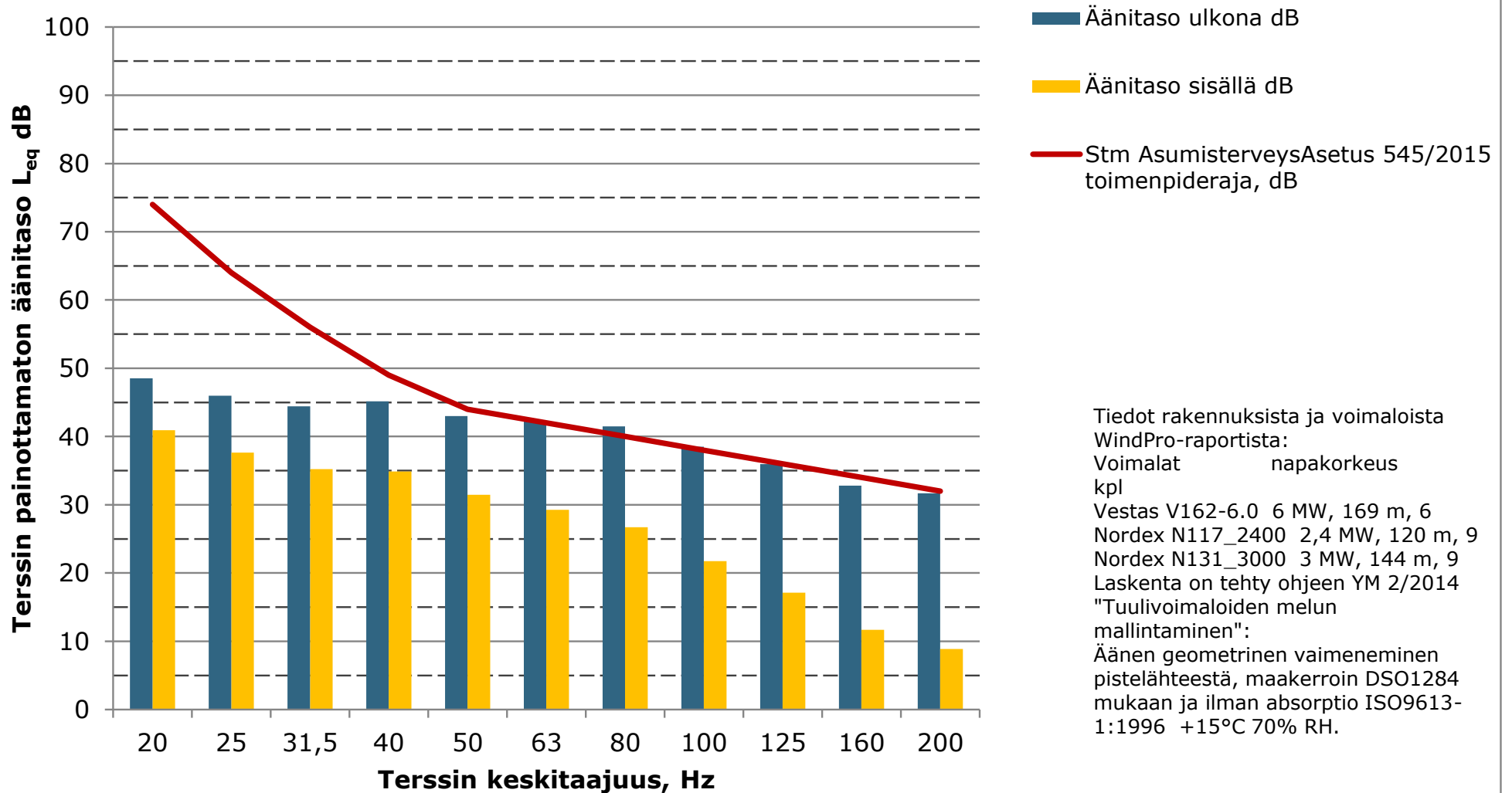
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus A,
Kankaanpääntie 534, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**

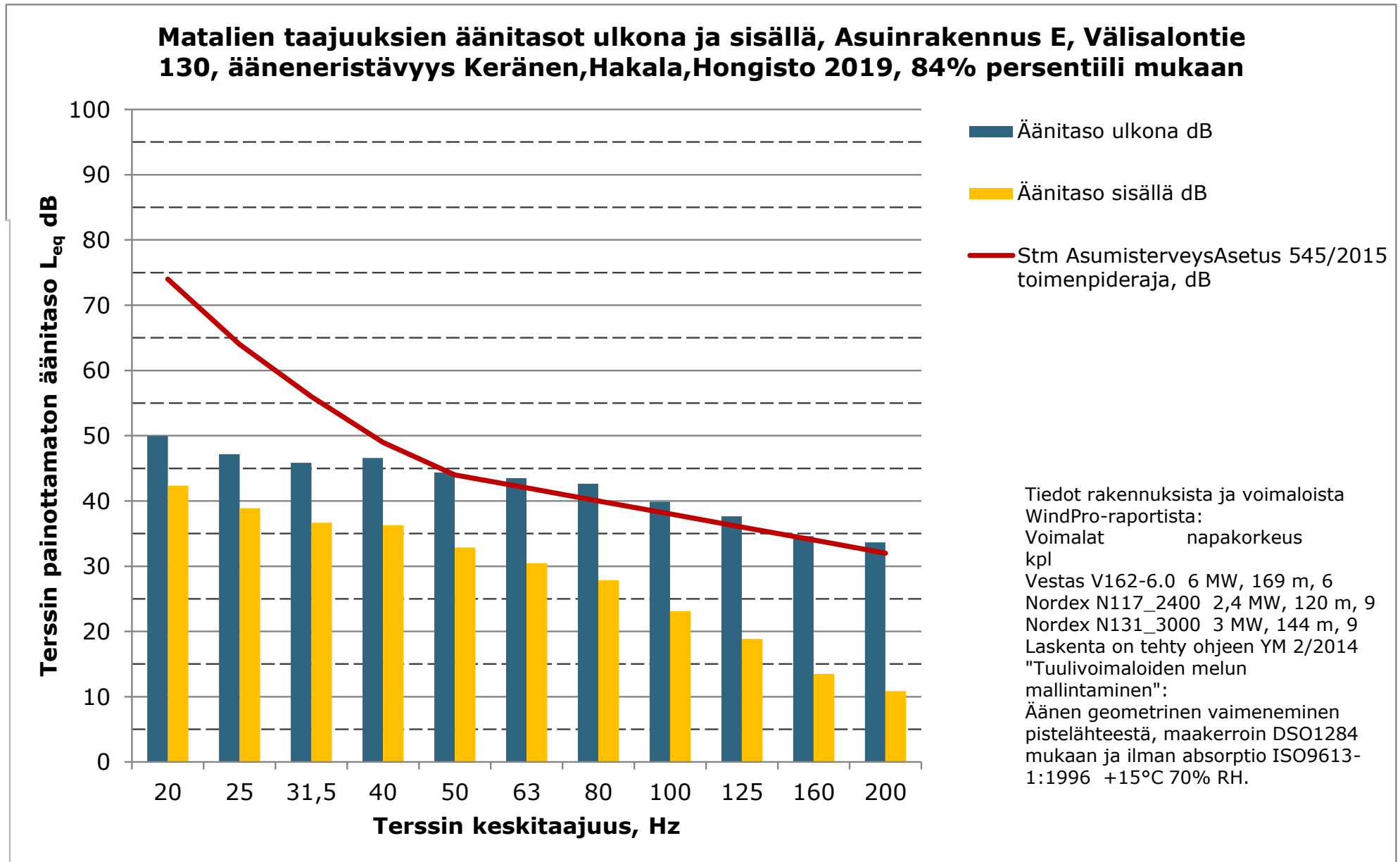


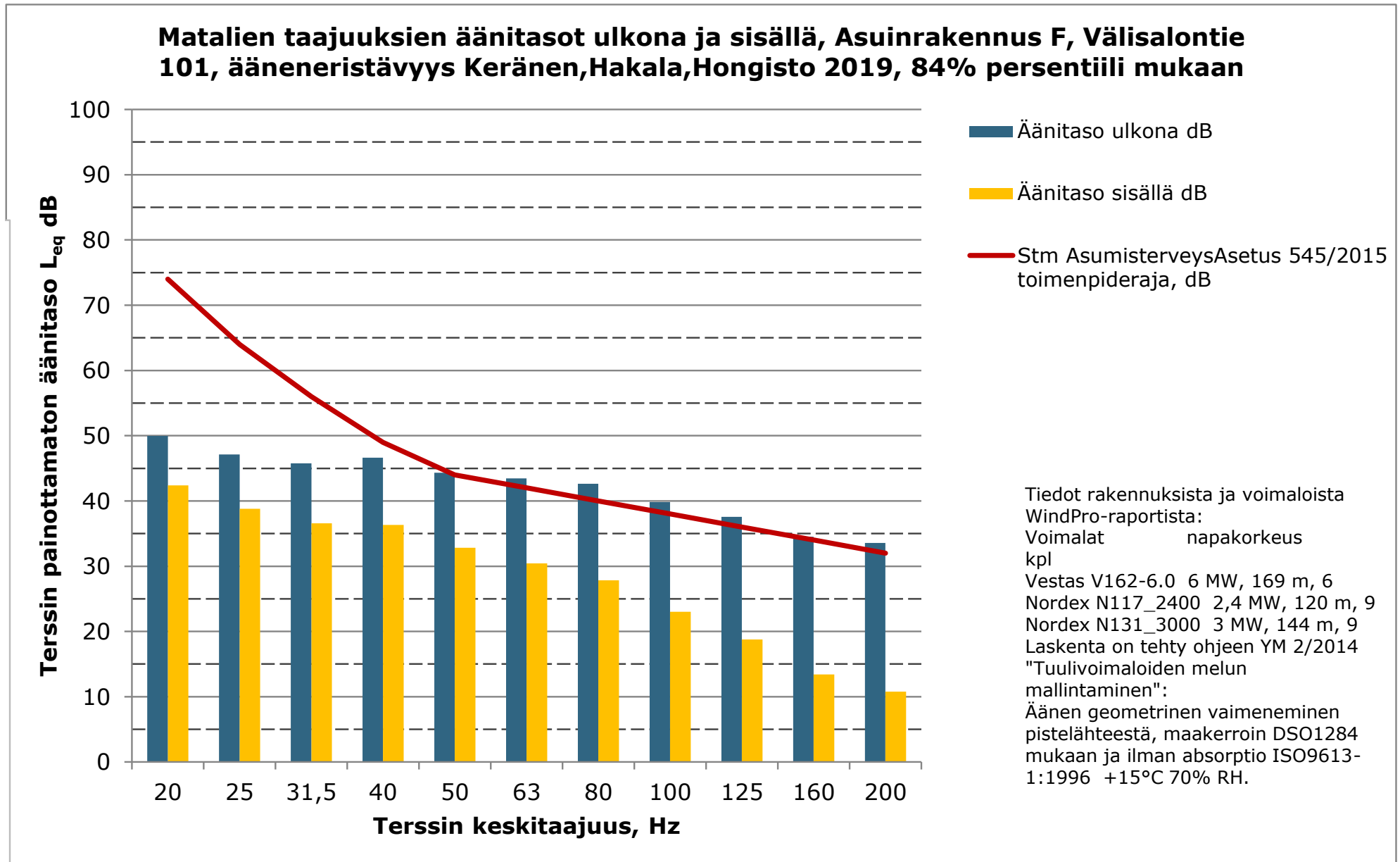




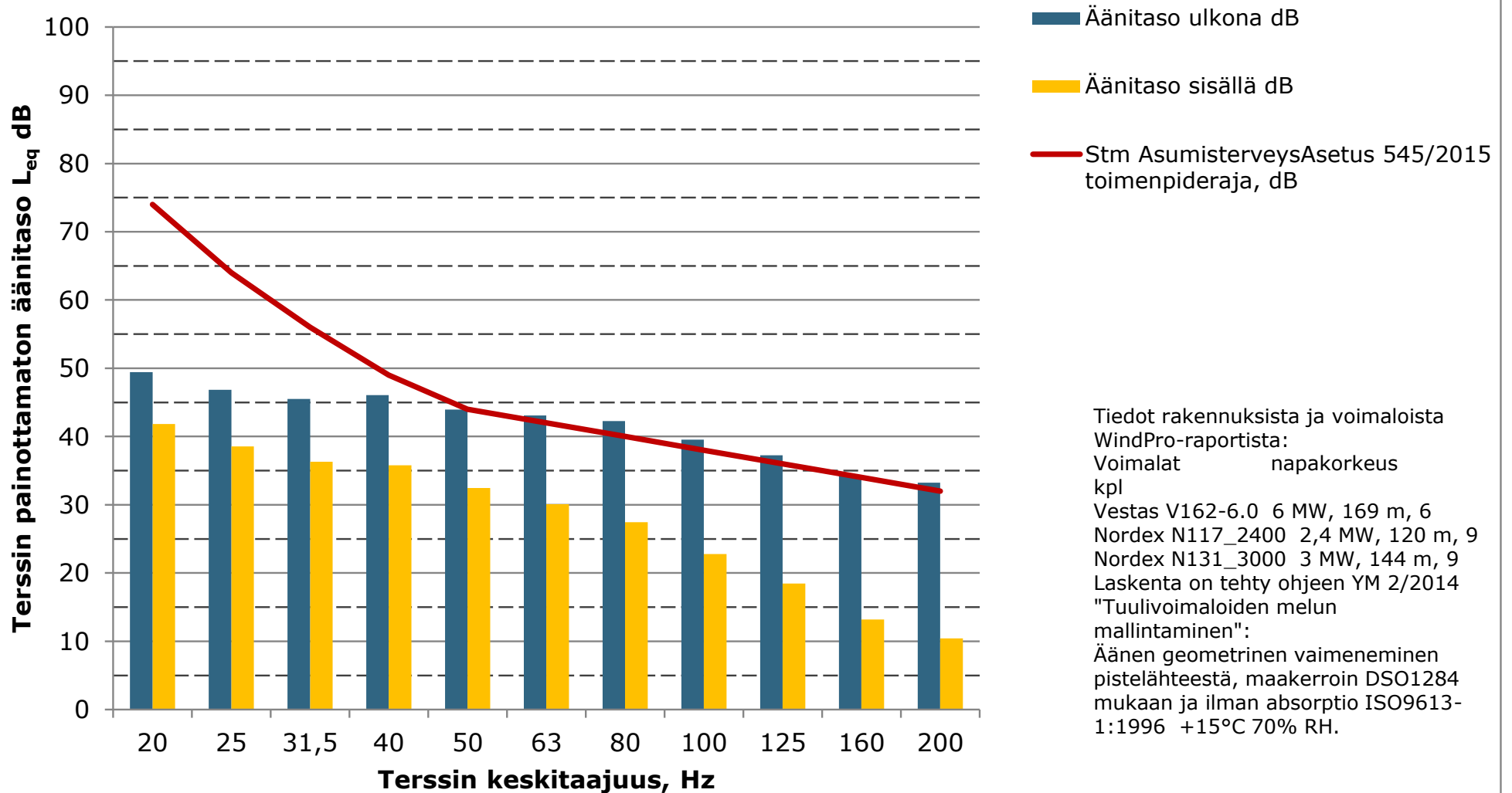
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus D,
Kankaanpääntie 646, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



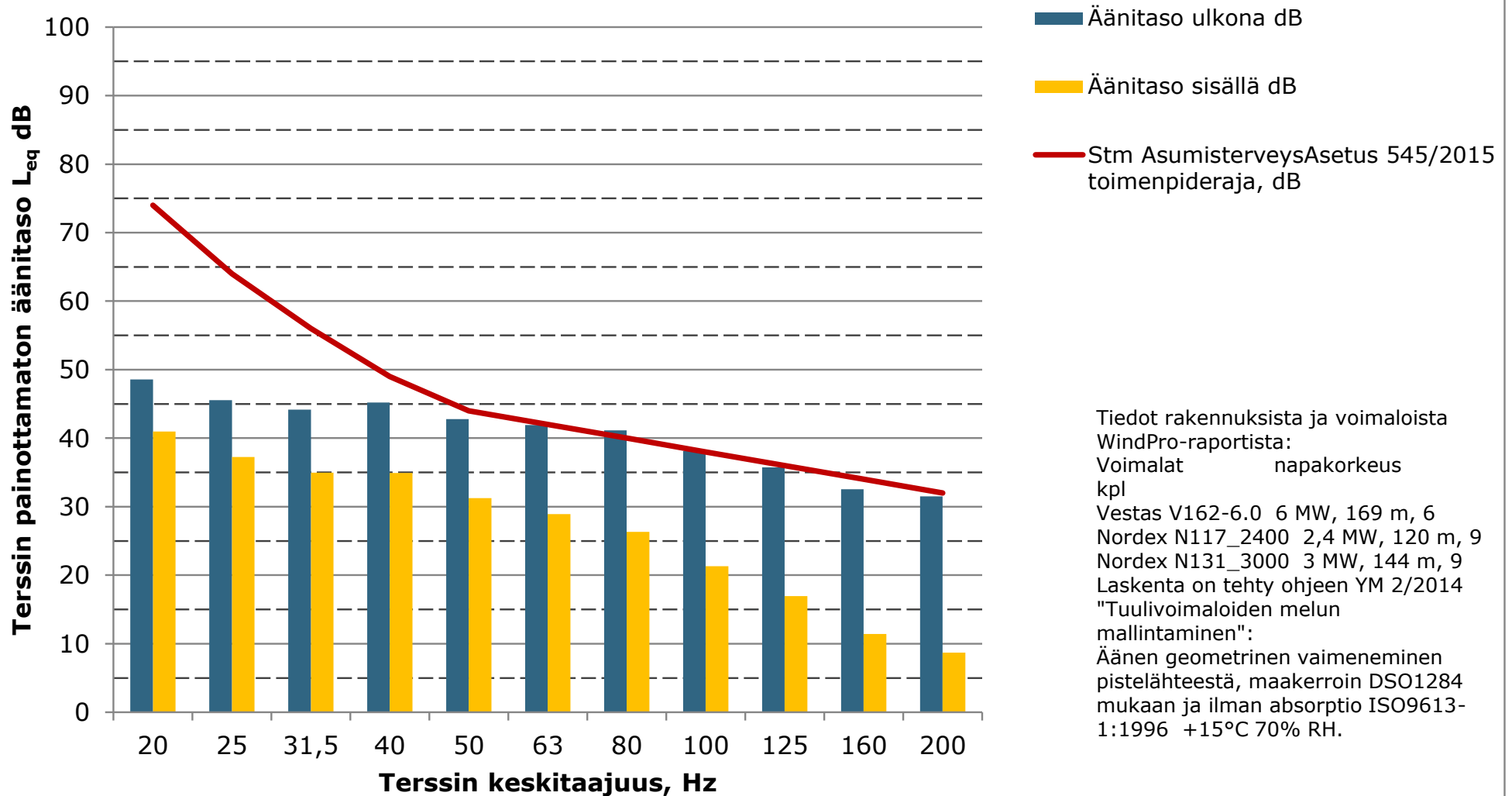




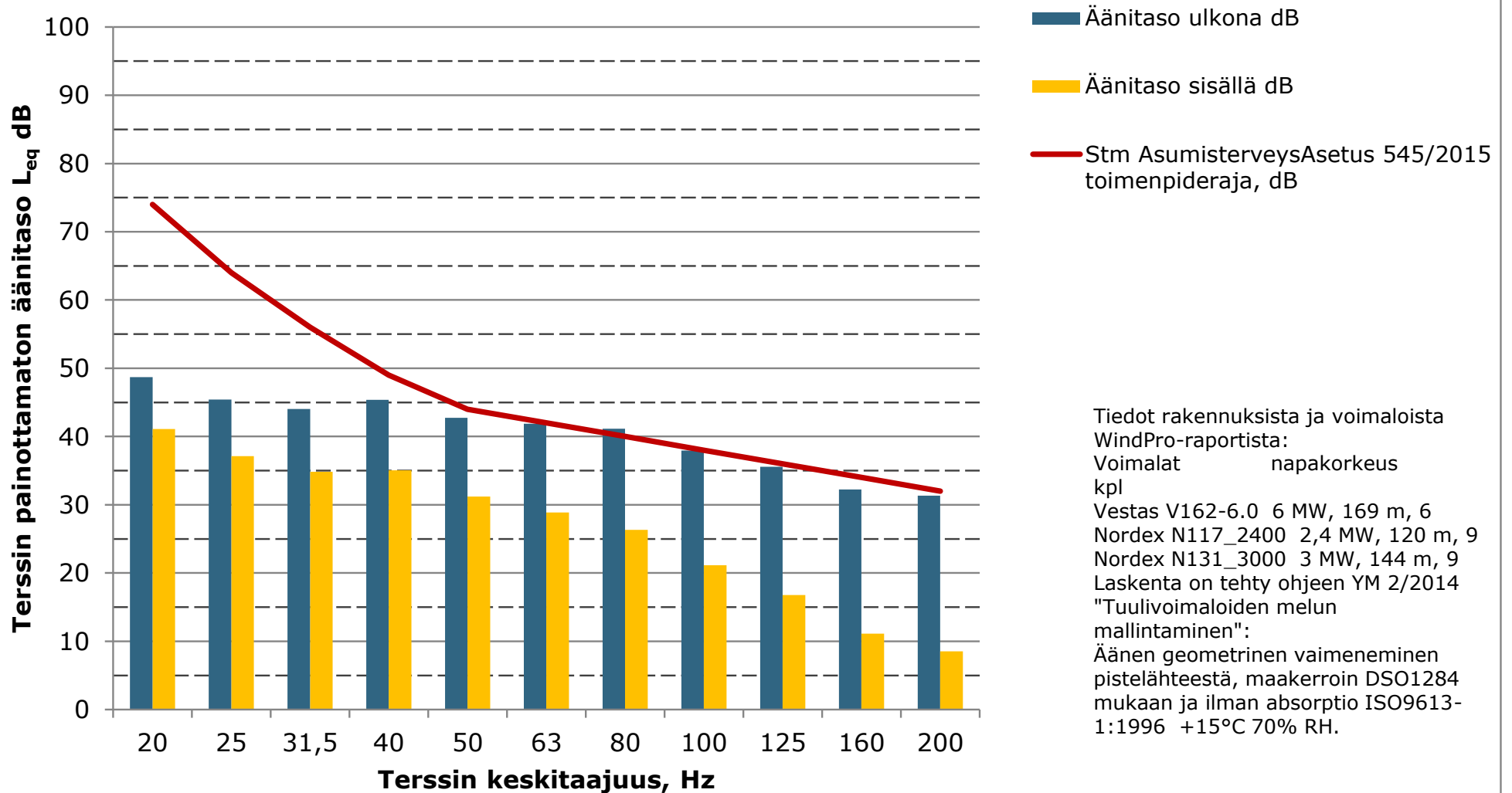
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus G,
Kankaanpääntie 468, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



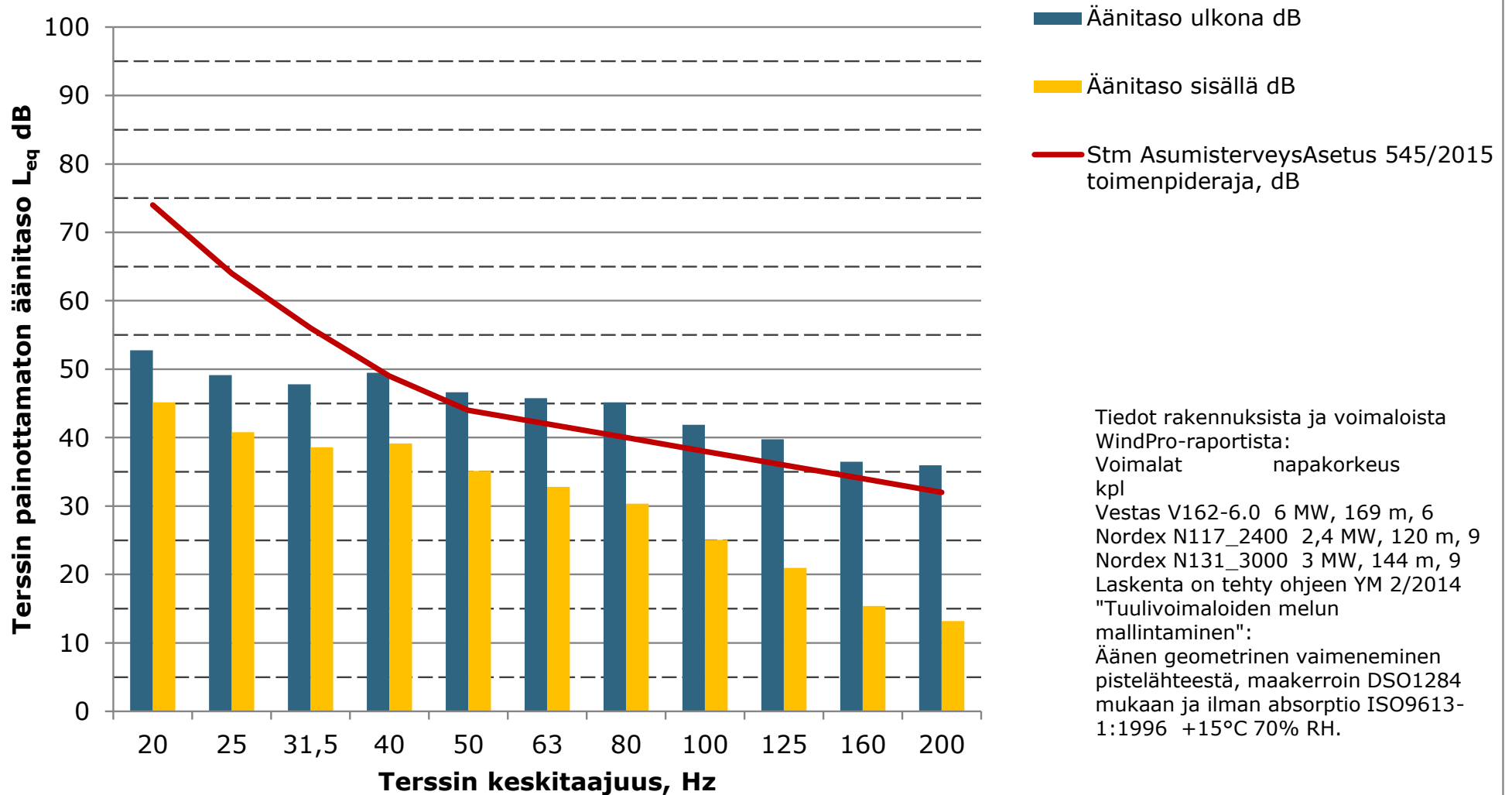
**Matalien taajuuksien äänitasot ulkona ja sisällä, Lomarakennus H,
Kankaanpääntie 320, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



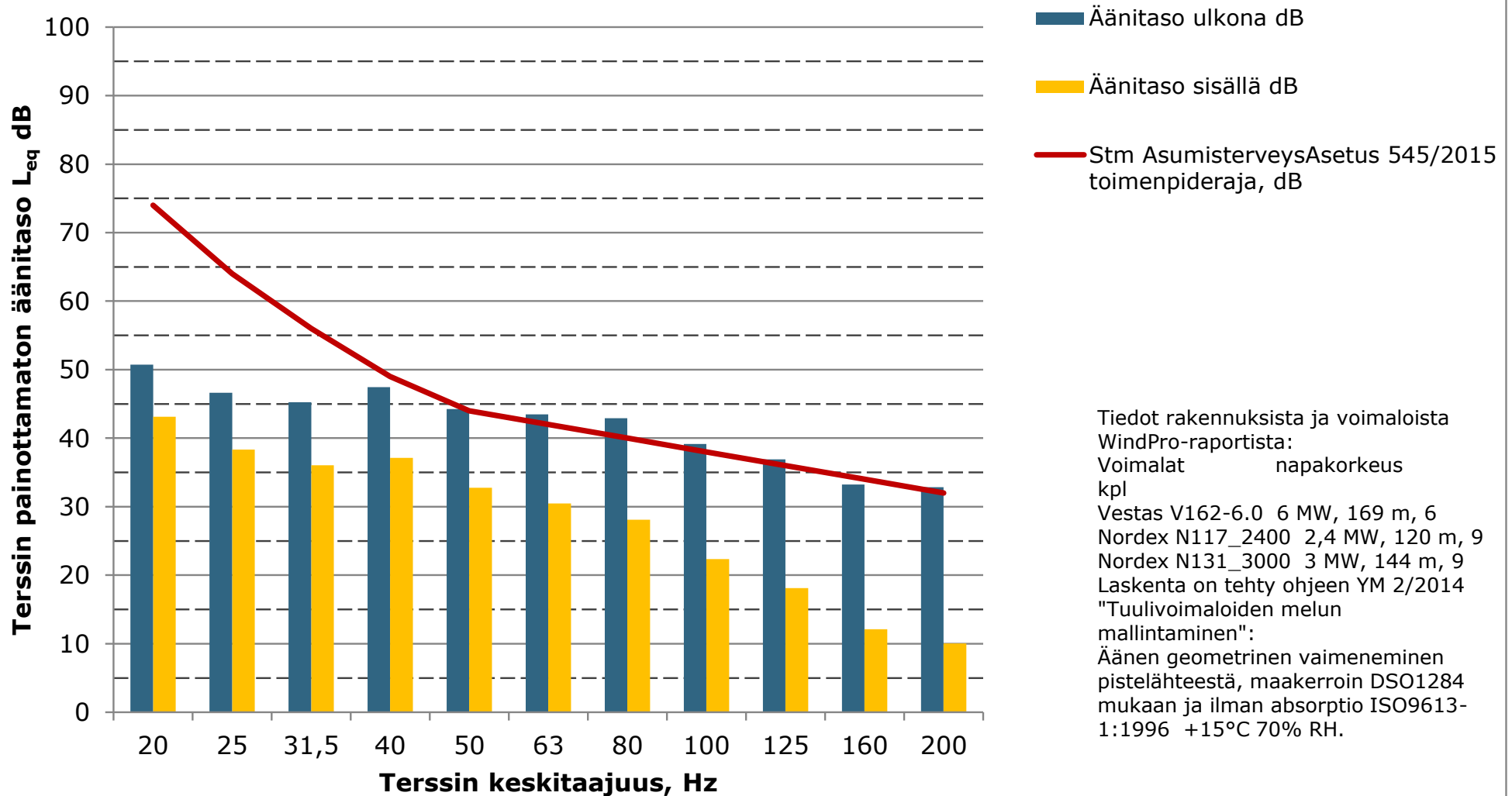
**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus I,
Kankaanpääntie 218, ääneneristävyys Keränen,Hakala,Hongisto 2019, 84%
persentiili mukaan**



**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus J,
Penkkinevantie 85, ääneneristävyys Keränen,Hakala,Hongisto 2019, 84%
persentiili mukaan**



**Matalien taajuuksien äänitasot ulkona ja sisällä, Asuinrakennus K,
Seppäkoskentie 36, ääneneristävyys Keränen, Hakala, Hongisto 2019, 84%
persentiili mukaan**



30.10.2021

Liite 3: Varjostusmallinnusten tulokset "real case, No Forest"

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

14.12.2021 14.24/3.4.388

SHADOW - Main Result

Calculation: Nykytila_Shadow_No_Forest_20211214

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

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: CONTOURLINE_EP_Tuulivoimaselvitys

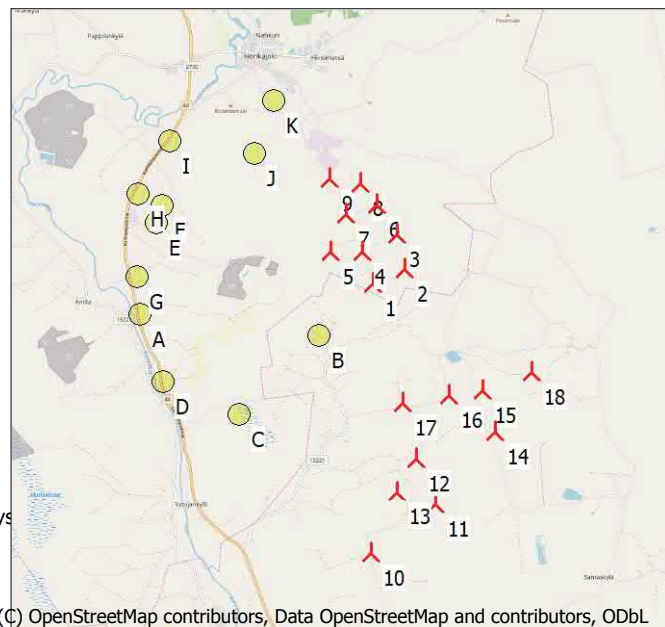
Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89



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

New WTG

Scale 1:125 000
Shadow receptor

WTGs

	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	253 616	6 878 546	105,0	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
2	254 154	6 878 757	112,2	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
3	254 073	6 879 329	112,5	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
4	253 487	6 879 084	110,0	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
5	252 957	6 879 121	107,5	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
6	253 775	6 879 840	115,0	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
7	253 252	6 879 721	117,5	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
8	253 525	6 880 225	115,0	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
9	253 026	6 880 328	115,0	NORDEX N117/2400 2400 116.8...Yes	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
10	253 256	6 874 086	105,0	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
11	254 378	6 874 820	112,5	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
12	254 139	6 875 605	109,4	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
13	253 765	6 875 082	105,6	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
14	255 464	6 875 947	110,0	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
15	255 305	6 876 650	112,5	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
16	254 745	6 876 621	107,5	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
17	253 975	6 876 541	107,4	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
18	256 142	6 876 896	110,0	NORDEX N131/3000 3000 131.0...Yes	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation	Slope of	Direction	Eye height
				[m]	[m]	[m]	a.g.l. [m]	window [°]	mode	(ZVI) a.g.l. [m]
A	Asuinrakennus A, ~Kankaanpääntie 534	249 740	6 878 307	92,4	5,0	5,0	1,0	90,0	"Green house mode"	6,0
B	Asuinrakennus B, ~Ristiläntie 459	252 656	6 877 758	100,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
C	Lomarakennus C, ~Variksentie 93	251 251	6 878 536	93,2	5,0	5,0	1,0	90,0	"Green house mode"	6,0
D	Asuinrakennus D, ~Kankaanpääntie 646	250 034	6 877 181	87,7	5,0	5,0	1,0	90,0	"Green house mode"	6,0
E	Asuinrakennus E, ~Välisalon tie 130	250 125	6 879 799	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
F	Asuinrakennus F, ~Välisalon tie 101	250 226	6 880 083	97,6	5,0	5,0	1,0	90,0	"Green house mode"	6,0
G	Asuinrakennus G, ~Kankaanpääntie 468	249 740	6 878 942	94,8	5,0	5,0	1,0	90,0	"Green house mode"	6,0
H	Lomarakennus H, ~Kankaanpääntie 320	249 856	6 880 304	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
I	Asuinrakennus I, ~Kankaanpääntie 218	250 438	6 881 151	96,3	5,0	5,0	1,0	90,0	"Green house mode"	6,0
J	Asuinrakennus J, ~Penkkinevantie 85	251 819	6 880 838	102,5	5,0	5,0	1,0	90,0	"Green house mode"	6,0
K	Asuinrakennus K, ~Seppäkoskentie 36	252 204	6 881 690	105,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

SHADOW - Main Result

Calculation: Nykytila_Shadow_No_Forest_20211214

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values	
		Shadow hours	per year [h/year]
A	Asuinrakennus A, ~Kankaanpääntie 534		0:00
B	Asuinrakennus B, ~Ristiläntie 459		4:19
C	Lomarakennus C, ~Variksentie 93		0:00
D	Asuinrakennus D, ~Kankaanpääntie 646		0:00
E	Asuinrakennus E, ~Välisälontie 130		0:00
F	Asuinrakennus F, ~Välisälontie 101		0:00
G	Asuinrakennus G, ~Kankaanpääntie 468		0:00
H	Lomarakennus H, ~Kankaanpääntie 320		0:00
I	Asuinrakennus I, ~Kankaanpääntie 218		0:00
J	Asuinrakennus J, ~Penkkinevantie 85		1:19
K	Asuinrakennus K, ~Seppäkoskentie 36		0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712)	16:37	4:19
2	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)	0:00	0:00
3	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714)	0:00	0:00
4	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)	0:00	0:00
5	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716)	0:00	0:00
6	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717)	0:00	0:00
7	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)	0:00	0:00
8	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719)	0:00	0:00
9	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)	7:44	1:19
10	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)	0:00	0:00
11	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)	0:00	0:00
12	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)	0:00	0:00
13	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)	0:00	0:00
14	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)	0:00	0:00
15	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)	0:00	0:00
16	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)	0:00	0:00
17	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)	0:00	0:00
18	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)	0:00	0:00

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.

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.24	15.15
4	09.52	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.07	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.59	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.15	20.38	22.00	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.50	20.11	18.34	16.02	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.11	23.19	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.22	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.19	08.46	09.51
	15.50	17.19	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.41	09.07	09.56
	16.12	17.41	18.58	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.47	06.17	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.25	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Paholammi / Neoen

Licensed user:

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

14.12.2021 14.24/3.4.388

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214Shadow receptor: B - Asuinrakennus B, ~Ristolantie 459

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December				
1	09.54	08.59	07.37	06.57	05.21	04.01	04.49 (1)	03.48	04.51 (1)	04.55	06.18	07.36	08.00	09.22		
	15.15	16.32	17.52	20.16	21.38	22.59	16	05.05 (1)	23.22	20.16	20.43	19.05	16.29	15.18		
2	09.54	08.56	07.34	06.53	05.18	03.59	04.47 (1)	03.49	04.51 (1)	04.58	06.21	07.38	08.03	09.24		
	15.17	16.35	17.55	20.19	21.41	23.01	19	05.06 (1)	23.21	23	05.14 (1)	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	04.47 (1)	03.50	04.52 (1)	05.00	06.23	07.41	08.06	09.27		
	15.19	16.38	17.58	20.21	21.43	23.03	19	05.06 (1)	23.20	23	05.15 (1)	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	04.47 (1)	03.52	04.52 (1)	05.03	06.26	07.44	08.09	09.29		
	15.20	16.40	18.01	20.24	21.46	23.05	20	05.07 (1)	23.19	22	05.14 (1)	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	04.47 (1)	03.53	04.52 (1)	05.06	06.29	07.46	08.11	09.31		
	15.22	16.43	18.03	20.27	21.49	23.07	21	05.08 (1)	23.17	22	05.14 (1)	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	04.47 (1)	03.55	04.53 (1)	05.09	06.31	07.49	08.14	09.33		
	15.24	16.46	18.06	20.29	21.52	23.09	21	05.08 (1)	23.16	21	05.14 (1)	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	04.47 (1)	03.56	04.54 (1)	05.11	06.34	07.52	08.17	09.35		
	15.26	16.49	18.09	20.32	21.55	23.10	22	05.09 (1)	23.15	20	05.14 (1)	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	04.47 (1)	03.58	04.54 (1)	05.14	06.36	07.54	08.20	09.37		
	15.28	16.52	18.12	20.35	21.57	23.12	22	05.09 (1)	23.13	20	05.14 (1)	21.58	20.21	18.43	16.09	15.09
9	09.47	08.37	07.11	06.31	04.58	03.48	04.47 (1)	04.00	04.55 (1)	05.17	06.39	07.57	08.23	09.39		
	15.30	16.55	18.14	20.38	22.00	23.14	22	05.09 (1)	23.12	19	05.14 (1)	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.47 (1)	04.02	04.55 (1)	05.19	06.42	07.59	08.26	09.41		
	15.33	16.58	18.17	20.40	22.03	23.15	22	05.09 (1)	23.10	18	05.13 (1)	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.46 (1)	04.04	04.56 (1)	05.22	06.44	08.02	08.28	09.42		
	15.35	17.01	18.20	20.43	22.06	23.17	23	05.09 (1)	23.08	17	05.13 (1)	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.47 (1)	04.06	04.57 (1)	05.25	06.47	08.05	08.31	09.44		
	15.37	17.04	18.22	20.46	22.08	23.18	23	05.10 (1)	23.06	15	05.12 (1)	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.47 (1)	04.08	04.59 (1)	05.28	06.49	08.07	08.34	09.45		
	15.40	17.07	18.25	20.48	22.11	23.19	23	05.10 (1)	23.04	13	05.12 (1)	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.47 (1)	04.10	05.01 (1)	05.30	06.52	08.10	08.37	09.47		
	15.42	17.10	18.28	20.51	22.14	23.20	24	05.11 (1)	23.02	10	05.11 (1)	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.48 (1)	04.12	05.03 (1)	05.33	06.54	08.13	08.40	09.48		
	15.45	17.13	18.31	20.54	22.17	23.21	23	05.11 (1)	23.00	8	05.11 (1)	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.47 (1)	04.15	05.04 (1)	05.36	06.57	08.16	08.43	09.49		
	15.47	17.15	18.33	20.57	22.19	23.22	24	05.11 (1)	22.58	4	05.08 (1)	21.34	19.54	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.47 (1)	04.17	05.38	07.00	08.18	08.45	09.51			
	15.50	17.18	18.36	20.59	22.22	23.23	24	05.11 (1)	22.56	21.31	19.51	18.14	15.46	15.04		
18	09.32	08.11	06.42	06.02	04.33	03.41	04.48 (1)	04.19	05.41	07.02	08.21	08.48	09.52			
	15.52	17.21	18.39	21.02	22.25	23.24	24	05.12 (1)	22.54	21.28	19.48	18.11	15.44	15.04		
19	09.30	08.08	06.39	05.59	04.30	03.41	04.48 (1)	04.22	05.44	07.05	08.24	08.51	09.52			
	15.55	17.24	18.41	21.05	22.27	23.24	24	05.12 (1)	22.52	21.25	19.45	18.08	15.42	15.04		
20	09.28	08.05	06.36	05.55	04.28	03.41	04.48 (1)	04.24	05.46	07.07	08.26	08.54	09.53			
	15.58	17.27	18.44	21.07	22.30	23.24	24	05.12 (1)	22.49	21.22	19.41	18.05	15.39	15.04		
21	09.25	08.02	06.33	05.52	04.25	03.41	04.48 (1)	04.27	05.49	07.10	08.29	08.56	09.54			
	16.00	17.30	18.47	21.10	22.33	23.25	24	05.12 (1)	22.47	21.18	19.38	18.02	15.37	15.04		
22	09.23	07.59	06.29	05.49	04.23	03.41	04.49 (1)	04.29	05.52	07.12	08.32	08.59	09.55			
	16.03	17.33	18.49	21.13	22.35	23.25	24	05.13 (1)	22.45	21.15	19.35	17.59	15.35	15.05		
23	09.21	07.56	06.26	05.46	04.20	03.42	04.49 (1)	04.32	05.54	07.15	08.35	09.02	09.55			
	16.06	17.35	18.52	21.16	22.38	23.25	24	05.13 (1)	22.42	21.12	19.32	17.56	15.33	15.05		
24	09.19	07.53	06.23	05.43	04.18	03.42	04.49 (1)	04.34	05.57	07.18	08.38	09.05	09.55			
	16.09	17.38	18.55	21.18	22.40	23.25	24	05.13 (1)	22.40	21.09	19.28	17.53	15.31	15.06		
25	09.16	07.49	06.20	05.40	04.16	03.42	04.49 (1)	04.37	06.00	07.20	07.40	09.07	09.56			
	16.12	17.41	18.57	21.21	22.43	23.25	24	05.13 (1)	22.37	21.06	19.25	16.50	15.29	15.07		
26	09.14	07.46	06.16	05.37	04.13	03.43	04.49 (1)	04.39	06.02	07.23	07.43	09.10	09.56			
	16.14	17.44	19.00	21.24	22.45	23.25	24	05.13 (1)	22.35	21.03	19.22	16.47	15.27	15.07		
27	09.12	07.43	06.13	05.34	04.11	03.44	04.50 (1)	04.42	06.05	07.25	07.46	09.12	09.56			
	16.17	17.47	19.03	21.27	22.48	1	04.57 (1)	23.24	23	05.13 (1)	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.55 (1)	03.45	04.50 (1)	04.44	06.08	07.28	07.49	09.15	09.56	
	16.20	17.49	19.05	21.30	22.50	6	05.01 (1)	23.24	24	05.14 (1)	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07	07.07	05.27	04.07	03.45	04.53 (1)	03.45	04.51 (1)	04.47	06.10	07.31	07.52	09.17	09.56		
	16.23	20.08	21.32	22.52	9	05.02 (1)	23.23	23	05.14 (1)	22.27	20.53	19.12	16.38	15.21	15.11	
30	09.04	07.03	05.24	04.05	03.47	04.51 (1)	03.47	04.50 (1)	04.50	06.13	07.33	07.54	09.20	09.55		
	16.26	20.11	21.35	22.55	12	05.03 (1)	23.22	23	05.13 (1)	22.24	20.50	19.09	16.35	15.19	15.12	
31	09.02	07.00	05.23	04.03	03.47	04.50 (1)	03.47	04.50 (1)	04.50	06.16	07.37	07.57	09.23	09.55		
	16.29	20.13	21.37	22.57	14	05.04 (1)	23.21	23	05.13 (1)	22.21	20.47	16.32	15.19	15.13		
Potential sun hours	194	247	364	443	547	586		578	495	390	311	215	167			
Total, worst case					42	677		278								
Sun reduction					0,50	0,47		0,48								
Oper. time red.					0,88	0,88		0,88								
Wind dir. red.					0,62	0,62		0,62								
Total reduction					0,27	0,26		0,26								
Total, real					12	175		73								

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: Nykytila_Shadow_No_Forest_20211214**Shadow receptor:** C - Lomarakenus C, ~Variksentie 93
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.06	16.29	15.18
2	09.54	08.56	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.34	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.10	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.14	20.38	22.00	23.14	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.49
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.55
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214**Shadow receptor:** D - Asuinrakennus D, ~Kankaanpääntie 646
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.22	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.58	03.51	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.24	15.15
4	09.52	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.21	15.14
5	09.51	08.49	07.24	06.44	05.10	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.17	22.07	20.31	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.07	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.12	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.15	20.38	22.00	23.14	23.12	21.55	20.18	18.40	16.07	15.08
10	09.45	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.34	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.47	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.18	08.46	09.51
	15.50	17.19	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.30	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.21	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.58	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	21.00	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.25	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214**Shadow receptor:** E - Asuinrakennus E, ~Välisälontie 130

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.09
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.15	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.25	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.07	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.07
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Nykytila_Shadow_No_Forest_20211214Shadow receptor: F - Asuinrakennus F, ~Välisäntie 101

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.27
	15.18	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.05	20.27	18.49	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.49	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.09
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.07	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214Shadow receptor: G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.59	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.15	20.38	22.00	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.50	20.11	18.34	16.02	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.12	23.19	23.05	21.44	20.05	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.22	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.19	08.46	09.51
	15.50	17.19	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.25	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.41	09.07	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.07
26	09.14	07.47	06.17	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Nykytila_Shadow_No_Forest_20211214**Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.25	06.44	05.09	03.54	03.53	05.06	06.29	07.47	08.12	09.31
	15.22	16.43	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.50	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.09
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.15	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.34	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.05	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.30	08.57	09.54
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Nykytila_Shadow_No_Forest_20211214Shadow receptor: I - Asuinrakennus I, ~Kankaanpääntie 218

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.23
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.02	23.21	22.16	20.40	19.02	16.26	15.16
3	09.54	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.27
	15.18	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.49	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.37	07.54	08.20	09.38
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.07
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.19	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.44	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.55	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.55
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.15	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.26	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.43	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.56
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Nykytila_Shadow_No_Forest_20211214 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.26 (9)	08.00	09.22	
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	22	08.48 (9)	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.26 (9)	08.03	09.25	
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	22	08.48 (9)	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.25 (9)	08.06	09.27	
	15.18	16.37	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	22	08.47 (9)	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.25 (9)	08.09	09.29	
	15.20	16.40	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	21	08.46 (9)	16.20	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.26 (9)	08.12	09.31	
	15.22	16.43	18.03	9 08.04 (9)	20.27	21.49	23.07	23.18	22.07	20.31	20	08.46 (9)	16.18	15.12
6	09.51	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.26 (9)	08.14	09.33	
	15.24	16.46	18.06	14 08.06 (9)	20.30	21.52	23.09	23.16	22.04	20.27	18	08.44 (9)	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.27 (9)	08.17	09.35	
	15.26	16.49	18.09	17 08.08 (9)	20.32	21.55	23.11	23.15	22.02	20.24	16	08.43 (9)	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.29 (9)	08.20	09.37	
	15.28	16.52	18.12	19 08.08 (9)	20.35	21.58	23.13	23.14	21.59	20.21	12	08.41 (9)	16.09	15.08
9	09.47	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.32 (9)	08.23	09.39	
	15.30	16.55	18.14	21 08.09 (9)	20.38	22.00	23.14	23.12	21.56	20.17	5	08.37 (9)	16.07	15.07
10	09.46	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41		
	15.32	16.58	18.17	21 08.09 (9)	20.40	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07	
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43		
	15.35	17.01	18.20	21 08.08 (9)	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06	
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44		
	15.37	17.04	18.23	21 08.08 (9)	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05	
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46		
	15.39	17.07	18.25	21 08.08 (9)	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05	
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47		
	15.42	17.10	18.28	20 08.07 (9)	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.54	15.04	
15	09.38	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.55	08.13	08.40	09.49		
	15.44	17.13	18.31	18 08.06 (9)	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04	
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50		
	15.47	17.15	18.33	15 08.04 (9)	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.03	
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51		
	15.50	17.18	18.36	11 08.01 (9)	20.59	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03	
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52		
	15.52	17.21	18.39	21.02	22.25	23.24	23.24	22.54	21.28	19.48	18.11	15.44	15.03	
19	09.30	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53		
	15.55	17.24	18.41	21.05	22.28	23.25	23.25	22.52	21.25	19.45	18.08	15.41	15.03	
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54		
	15.58	17.27	18.44	21.08	22.30	23.25	23.25	22.50	21.22	19.41	18.05	15.39	15.04	
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54		
	16.00	17.30	18.47	21.10	22.33	23.25	23.25	22.47	21.19	19.38	18.02	15.37	15.04	
22	09.24	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55		
	16.03	17.33	18.49	21.13	22.36	23.26	23.26	22.45	21.16	19.35	17.59	15.35	15.04	
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55		
	16.06	17.35	18.52	21.16	22.38	23.26	23.26	22.43	21.12	19.32	17.56	15.33	15.05	
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56		
	16.09	17.38	18.55	21.19	22.41	23.26	23.26	22.40	21.09	19.28	17.53	15.30	15.05	
25	09.17	07.50	06.20	05.40	04.15	03.42	04.36	06.00	07.20	08.40	09.07	09.56		
	16.11	17.41	18.57	21.21	22.43	23.25	23.28	21.06	19.25	16.50	15.28	15.06		
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	08.34 (9)	07.43	09.10	09.56	
	16.14	17.44	19.00	21.24	22.46	23.25	23.25	21.03	19.22	9 08.43 (9)	16.47	15.26	15.07	
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	08.31 (9)	07.46	09.13	09.56	
	16.17	17.47	19.03	21.27	22.48	23.25	23.22	21.00	19.19	14 08.45 (9)	16.44	15.25	15.08	
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	08.29 (9)	07.49	09.15	09.56	
	16.20	17.50	19.05	21.30	22.50	23.24	23.20	20.56	19.15	17 08.46 (9)	16.41	15.23	15.09	
29	09.07	07.07	06.07	05.27	04.07	03.45	04.47	06.10	07.31	08.29 (9)	07.52	09.18	09.56	
	16.23	18.08	19.12	21.33	22.53	23.24	23.22	20.53	19.12	18 08.47 (9)	16.38	15.21	15.10	
30	09.04	07.03	06.03	05.24	04.04	03.46	04.50	06.13	07.33	08.27 (9)	07.55	09.20	09.56	
	16.26	18.11	19.15	21.35	22.55	23.23	23.24	20.50	19.09	20 08.47 (9)	16.35	15.19	15.12	
31	09.02	07.00	06.00	04.03	04.03	04.52	04.52	06.16	07.37	08.27	07.57	09.25	09.55	
	16.29	18.13	19.17	21.37	22.57	23.26	23.26	20.47	16.32	08.27	07.57	15.13	15.13	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166		
Total, worst case			228						78		158			
Sun reduction			0,36						0,36		0,25			
Oper. time red.			0,88						0,88		0,88			
Wind dir. red.			0,60						0,60		0,60			
Total reduction			0,19						0,19		0,13			
Total, real			43						15		21			

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: Nykytila_Shadow_No_Forest_20211214 **Shadow receptor:** K - Asuinrakennus K, ~Seppäkoskentie 36
 Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.00	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.48	04.58	06.21	07.38	08.03	09.25
	15.16	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.14
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.04	20.27	18.49	16.15	15.10
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.56	20.17	18.40	16.07	15.07
10	09.46	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46
	15.39	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	15.04
15	09.38	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.49
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.49	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.35	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.41	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.50	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.24	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

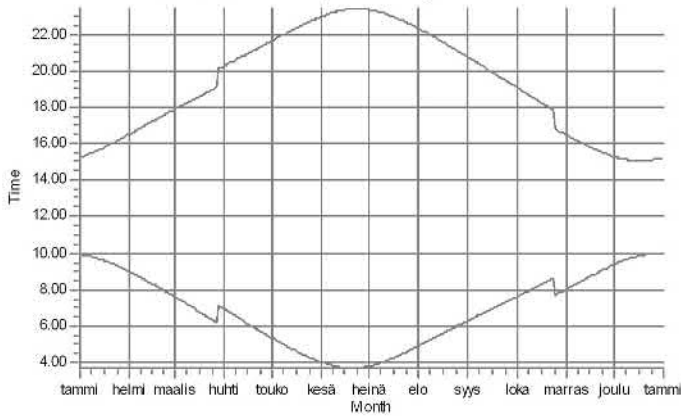
Table layout: For each day in each month the following matrix apply

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

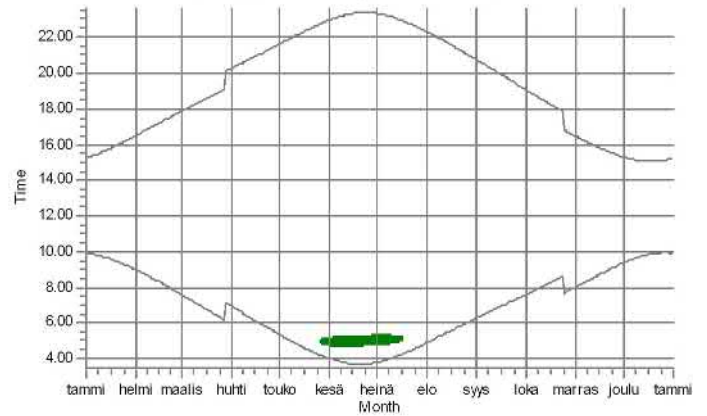
SHADOW - Calendar, graphical

Calculation: Nykytila_Shadow_No_Forest_20211214

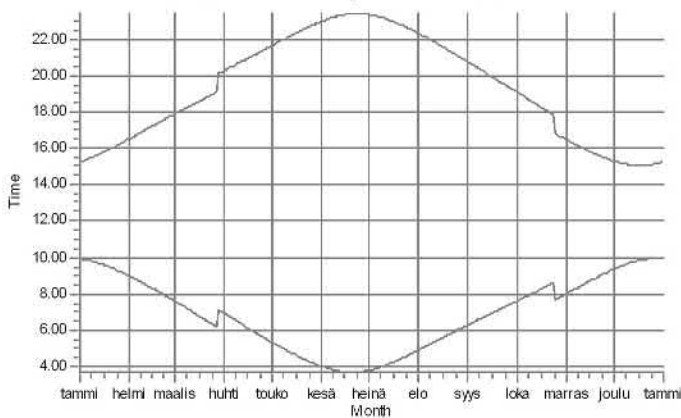
A: Asuinrakennus A, ~Kankaanpääntie 534



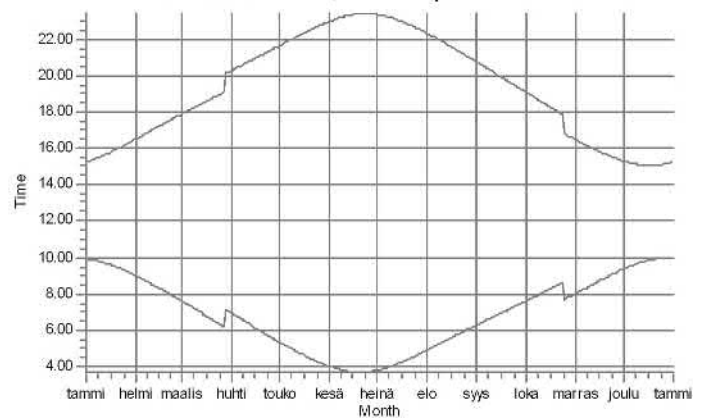
B: Asuinrakennus B, ~Ristiläntie 459



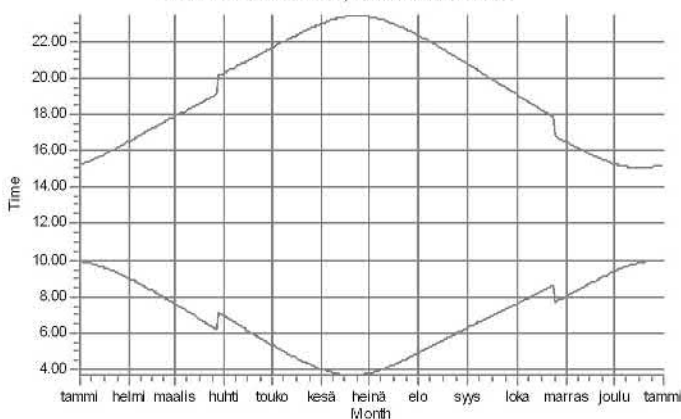
C: Lomarakennus C, ~Variksentie 93



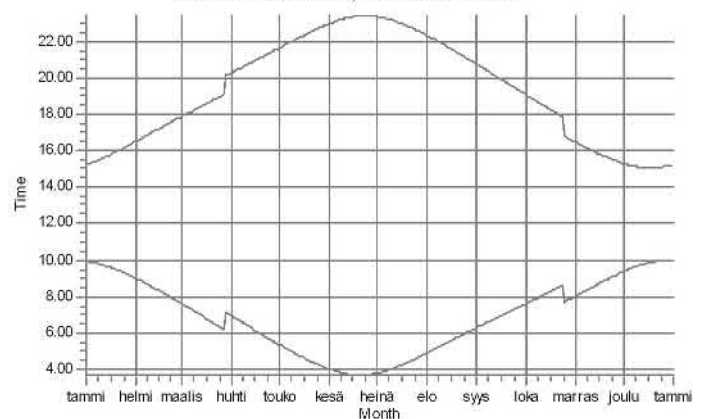
D: Asuinrakennus D, ~Kankaanpääntie 646



E: Asuinrakennus E, ~Välisalontie 130



F: Asuinrakennus F, ~Välisalontie 101

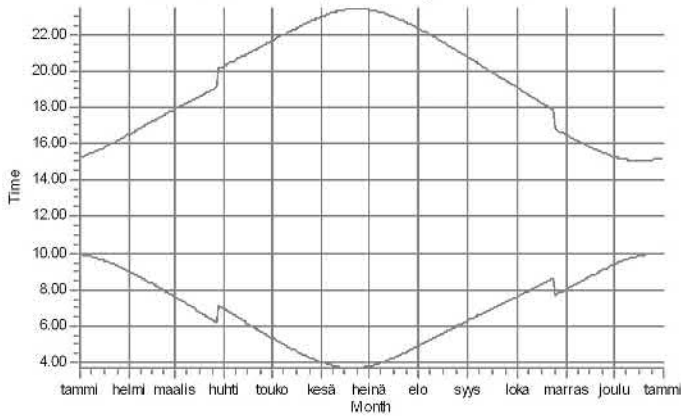


WTGs

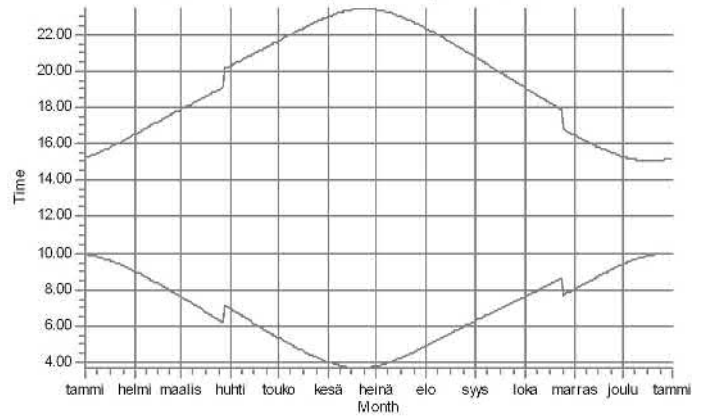
1: NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712)

SHADOW - Calendar, graphical**Calculation:** Nykytila_Shadow_No_Forest_20211214

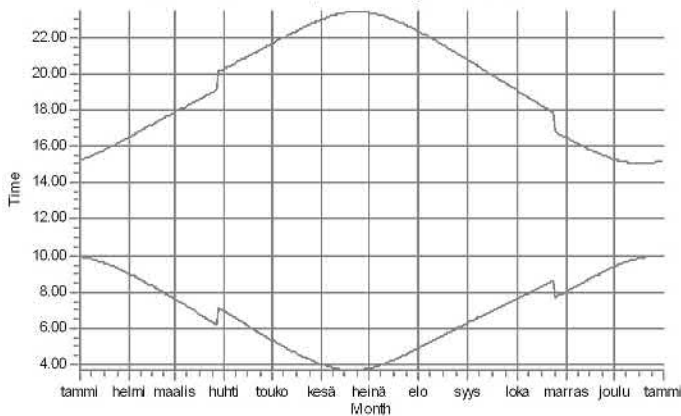
G: Asuinrakennus G, ~Kankaanpääntie 468



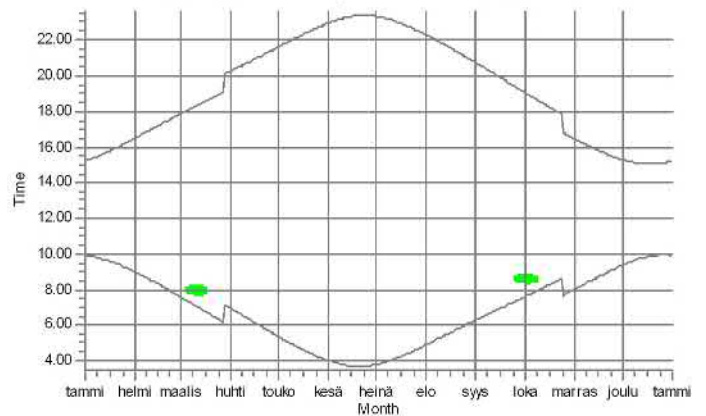
H: Lomarakennus H, ~Kankaanpääntie 320



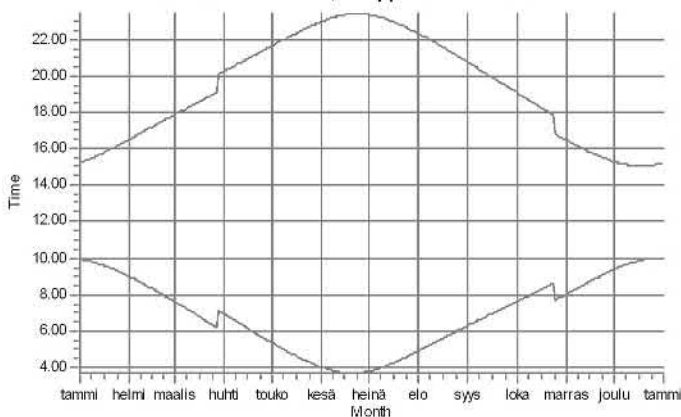
I: Asuinrakennus I, ~Kankaanpääntie 218



J: Asuinrakennus J, ~Penkkinevantie 85



K: Asuinrakennus K, ~Seppäkoskentie 36



WTGs

9: NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 1 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.54	08.59	07.37	06.57	05.21	04.01	04.49-05.05/16	03.47	04.51-05.14/23	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59		23.22		22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	04.47-05.06/19	03.49	04.51-05.14/23	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01		23.21		22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	04.47-05.06/19	03.50	04.52-05.15/23	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03		23.20		22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	04.47-05.07/20	03.51	04.52-05.14/22	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05		23.19		22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	04.47-05.08/21	03.53	04.52-05.14/22	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07		23.17		22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	04.47-05.08/21	03.55	04.53-05.14/21	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09		23.16		22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	04.47-05.09/22	03.56	04.54-05.14/20	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11		23.15		22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	04.47-05.09/22	03.58	04.54-05.14/20	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12		23.13		21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.47-05.09/22	04.00	04.55-05.14/19	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14		23.12		21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.47-05.09/22	04.02	04.55-05.13/18	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15		23.10		21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.46-05.09/23	04.04	04.56-05.13/17	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17		23.08		21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.47-05.10/23	04.06	04.57-05.12/15	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18		23.06		21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.47-05.10/23	04.08	04.59-05.12/13	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19		23.04		21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.47-05.11/24	04.10	05.01-05.11/10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20		23.02		21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.48-05.11/23	04.12	05.03-05.11/8	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21		23.00		21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.47-05.11/24	04.14	05.04-05.08/4	05.36	06.57	08.16	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22		22.58		21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.47-05.11/24	04.17		05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23		22.56		21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.48-05.12/24	04.19		05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24		22.54		21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.48-05.12/24	04.22		05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24		22.52		21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.48-05.12/24	04.24		05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25		22.49		21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.48-05.12/24	04.26		05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25		22.47		21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.49-05.13/24	04.29		05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25		22.45		21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.49-05.13/24	04.31		05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25		22.42		21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.49-05.13/24	04.34		05.57	07.18	08.37	09.05	09.55
	16.09	17.38	18.55	21.18	22.40	23.25		22.40		21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.49-05.13/24	04.36		06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25		22.37		21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.49-05.13/24	04.39		06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25		22.35		21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	04.56-04.57/1	03.44	04.50-05.13/23	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24		22.32		20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	04.55-05.01/6	03.44	04.50-05.14/24	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24		22.29		20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	04.53-05.02/9	03.45	04.51-05.14/23	04.47	06.10	07.31	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23		22.27		20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	04.51-05.03/12	03.46	04.50-05.13/23	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22		22.24		20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03	04.50-05.04/14		04.52		06.15		07.57		09.55
	16.29		20.13		22.57			22.21		20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586		578		495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	42	677		278		0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 2 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)
Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 3 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54 15.15	08.59 16.32	07.37 17.52	06.57 20.16	05.21 21.38	04.01 22.59	03.47 23.22	04.55 22.18	06.18 20.43	07.36 19.05	08.00 16.29	09.22 15.17
2	09.54 15.17	08.56 16.34	07.34 17.55	06.53 20.19	05.18 21.41	03.59 23.01	03.49 23.21	04.58 22.16	06.21 20.40	07.38 19.02	08.03 16.26	09.24 15.16
3	09.53 15.18	08.54 16.37	07.31 17.58	06.50 20.21	05.15 21.43	03.57 23.03	03.50 23.20	05.00 22.13	06.23 20.37	07.41 18.59	08.06 16.23	09.27 15.14
4	09.52 15.20	08.51 16.40	07.27 18.00	06.47 20.24	05.12 21.46	03.55 23.05	03.51 23.19	05.03 22.10	06.26 20.34	07.44 18.56	08.09 16.20	09.29 15.13
5	09.51 15.22	08.48 16.43	07.24 18.03	06.44 20.27	05.09 21.49	03.54 23.07	03.53 23.17	05.06 22.07	06.29 20.30	07.46 18.52	08.11 16.17	09.31 15.12
6	09.50 15.24	08.46 16.46	07.21 18.06	06.40 20.29	05.06 21.52	03.52 23.09	03.54 23.16	05.08 22.04	06.31 20.27	07.49 18.49	08.14 16.15	09.33 15.10
7	09.49 15.26	08.43 16.49	07.18 18.09	06.37 20.32	05.03 21.55	03.51 23.11	03.56 23.15	05.11 22.01	06.34 20.24	07.51 18.46	08.17 16.12	09.35 15.09
8	09.48 15.28	08.40 16.52	07.15 18.11	06.34 20.35	05.00 21.57	03.49 23.12	03.58 23.13	05.14 21.58	06.36 20.21	07.54 18.43	08.20 16.09	09.37 15.08
9	09.47 15.30	08.37 16.55	07.11 18.14	06.31 20.37	04.57 22.00	03.48 23.14	04.00 23.12	05.16 21.55	06.39 20.17	07.57 18.40	08.23 16.06	09.39 15.07
10	09.45 15.32	08.34 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.15	04.02 23.10	05.19 21.52	06.41 20.14	07.59 18.36	08.26 16.04	09.41 15.06
11	09.44 15.35	08.31 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17	04.04 23.08	05.22 21.49	06.44 20.11	08.02 18.33	08.28 16.01	09.42 15.06
12	09.42 15.37	08.29 17.04	07.02 18.22	06.21 20.46	04.49 22.08	03.45 23.18	04.06 23.06	05.25 21.46	06.47 20.07	08.05 18.30	08.31 15.59	09.44 15.05
13	09.41 15.39	08.26 17.07	06.58 18.25	06.18 20.48	04.46 22.11	03.44 23.19	04.08 23.05	05.27 21.43	06.49 20.04	08.07 18.27	08.34 15.56	09.46 15.04
14	09.39 15.42	08.23 17.09	06.55 18.28	06.14 20.51	04.43 22.14	03.43 23.20	04.10 23.03	05.30 21.40	06.52 20.01	08.10 18.24	08.37 15.53	09.47 15.04
15	09.37 15.44	08.20 17.12	06.52 18.30	06.11 20.54	04.41 22.17	03.42 23.21	04.12 23.01	05.33 21.37	06.54 19.58	08.13 18.21	08.40 15.51	09.48 15.04
16	09.35 15.47	08.17 17.15	06.49 18.33	06.08 20.56	04.38 22.19	03.42 23.22	04.14 22.58	05.35 21.34	06.57 19.54	08.16 18.17	08.43 15.48	09.50 15.03
17	09.34 15.49	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.41 23.23	04.17 22.56	05.38 21.31	07.00 19.51	08.18 18.14	08.45 15.46	09.51 15.03
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24	04.19 22.54	05.41 21.28	07.02 19.48	08.21 18.11	08.48 15.44	09.52 15.03
19	09.30 15.55	08.08 17.24	06.39 18.41	05.58 21.05	04.30 22.27	03.41 23.24	04.21 22.52	05.44 21.25	07.05 19.45	08.24 18.08	08.51 15.41	09.53 15.03
20	09.28 15.57	08.05 17.27	06.36 18.44	05.55 21.07	04.27 22.30	03.41 23.25	04.24 22.50	05.46 21.22	07.07 19.41	08.26 18.05	08.54 15.39	09.53 15.04
21	09.25 16.00	08.02 17.30	06.32 18.47	05.52 21.10	04.25 22.33	03.41 23.25	04.26 22.47	05.49 21.18	07.10 19.38	08.29 18.02	08.56 15.37	09.54 15.04
22	09.23 16.03	07.59 17.32	06.29 18.49	05.49 21.13	04.22 22.35	03.41 23.25	04.29 22.45	05.52 21.15	07.12 19.35	08.32 17.59	08.59 15.35	09.55 15.04
23	09.21 16.06	07.56 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25	04.31 22.42	05.54 21.12	07.15 19.31	08.35 17.56	09.02 15.32	09.55 15.05
24	09.19 16.09	07.52 17.38	06.23 18.55	05.43 21.18	04.18 22.40	03.42 23.25	04.34 22.40	05.57 21.09	07.18 19.28	08.37 17.53	09.05 15.30	09.56 15.05
25	09.16 16.11	07.49 17.41	06.19 18.57	05.40 21.21	04.15 22.43	03.42 23.25	04.36 22.37	06.00 21.06	07.20 19.25	07.40 16.50	09.07 15.28	09.56 15.06
26	09.14 16.14	07.46 17.44	06.16 19.00	05.36 21.24	04.13 22.45	03.43 23.25	04.39 22.35	06.02 21.03	07.23 19.22	07.43 16.47	09.10 15.26	09.56 15.07
27	09.12 16.17	07.43 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.24	04.42 22.32	06.05 20.59	07.25 19.18	07.46 16.44	09.12 15.24	09.56 15.08
28	09.09 16.20	07.40 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24	04.44 22.29	06.08 20.56	07.28 19.15	07.49 16.41	09.15 15.23	09.56 15.09
29	09.07 16.23	07.37 17.52	06.07 19.08	05.27 21.32	04.07 22.52	03.45 23.23	04.47 22.27	06.10 20.53	07.30 19.12	07.51 16.38	09.17 15.21	09.56 15.10
30	09.04 16.26	07.34 17.55	06.04 19.09	05.24 21.35	04.04 22.55	03.46 23.23	04.49 22.24	06.13 20.50	07.33 19.09	07.54 16.35	09.20 15.19	09.55 15.12
31	09.02 16.29	07.31 17.58	06.01 19.10	05.21 21.36	04.01 22.56	03.44 23.22	04.46 22.25	06.15 20.47	07.35 19.10	07.57 16.32	09.21 15.18	09.55 15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 4 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 5 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 6 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717
Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG: 7 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)**

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55 15.15	08.59 16.32	07.37 17.52	06.57 20.16	05.21 21.38	04.01 22.59	03.47 23.22	04.55 22.19	06.18 20.43	07.36 19.05	08.00 16.29	09.22 15.18
2	09.54 15.17	08.57 16.34	07.34 17.55	06.53 20.19	05.18 21.41	03.59 23.01	03.49 23.21	04.58 22.16	06.21 20.40	07.38 19.02	08.03 16.26	09.25 15.16
3	09.53 15.18	08.54 16.37	07.31 17.58	06.50 20.21	05.15 21.44	03.57 23.03	03.50 23.20	05.00 22.13	06.23 20.37	07.41 18.59	08.06 16.23	09.27 15.14
4	09.52 15.20	08.51 16.40	07.27 18.01	06.47 20.24	05.12 21.46	03.55 23.05	03.51 23.19	05.03 22.10	06.26 20.34	07.44 18.56	08.09 16.20	09.29 15.13
5	09.51 15.22	08.48 16.43	07.24 18.03	06.44 20.27	05.09 21.49	03.54 23.07	03.53 23.18	05.06 22.07	06.29 20.30	07.46 18.52	08.11 16.18	09.31 15.12
6	09.50 15.24	08.46 16.46	07.21 18.06	06.40 20.29	05.06 21.52	03.52 23.09	03.54 23.16	05.08 22.04	06.31 20.27	07.49 18.49	08.14 16.15	09.33 15.11
7	09.49 15.26	08.43 16.49	07.18 18.09	06.37 20.32	05.03 21.55	03.51 23.11	03.56 23.15	05.11 22.01	06.34 20.24	07.52 18.46	08.17 16.12	09.35 15.09
8	09.48 15.28	08.40 16.52	07.15 18.12	06.34 20.35	05.00 21.58	03.49 23.12	03.58 23.13	05.14 21.58	06.36 20.21	07.54 18.43	08.20 16.09	09.37 15.08
9	09.47 15.30	08.37 16.55	07.11 18.14	06.31 20.38	04.57 22.00	03.48 23.14	04.00 23.12	05.17 21.55	06.39 20.17	07.57 18.40	08.23 16.07	09.39 15.07
10	09.45 15.32	08.34 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.15	04.02 23.10	05.19 21.52	06.42 20.14	07.59 18.36	08.26 16.04	09.41 15.06
11	09.44 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17	04.04 23.08	05.22 21.49	06.44 20.11	08.02 18.33	08.29 16.01	09.43 15.06
12	09.42 15.37	08.29 17.04	07.02 18.22	06.21 20.46	04.49 22.09	03.45 23.18	04.06 23.06	05.25 21.46	06.47 20.08	08.05 18.30	08.31 15.59	09.44 15.05
13	09.41 15.39	08.26 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19	04.08 23.05	05.27 21.43	06.49 20.04	08.07 18.27	08.34 15.56	09.46 15.04
14	09.39 15.42	08.23 17.10	06.55 18.28	06.14 20.51	04.43 22.14	03.43 23.20	04.10 23.03	05.30 21.40	06.52 20.01	08.10 18.24	08.37 15.53	09.47 15.04
15	09.37 15.44	08.20 17.12	06.52 18.31	06.11 20.54	04.41 22.17	03.42 23.21	04.12 23.01	05.33 21.37	06.54 19.58	08.13 18.21	08.40 15.51	09.48 15.04
16	09.36 15.47	08.17 17.15	06.49 18.33	06.08 20.57	04.38 22.19	03.42 23.22	04.14 22.59	05.36 21.34	06.57 19.54	08.16 18.17	08.43 15.49	09.50 15.03
17	09.34 15.49	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.41 23.23	04.17 22.56	05.38 21.31	07.00 19.51	08.18 18.14	08.46 15.46	09.51 15.03
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24	04.19 22.54	05.41 21.28	07.02 19.48	08.21 18.11	08.48 15.44	09.52 15.03
19	09.30 15.55	08.08 17.24	06.39 18.41	05.58 21.05	04.30 22.27	03.41 23.24	04.21 22.52	05.44 21.25	07.05 19.45	08.24 18.08	08.51 15.41	09.53 15.03
20	09.28 15.57	08.05 17.27	06.36 18.44	05.55 21.08	04.27 22.30	03.41 23.25	04.24 22.50	05.46 21.22	07.07 19.41	08.26 18.05	08.54 15.39	09.53 15.04
21	09.26 16.00	08.02 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25	04.26 22.47	05.49 21.19	07.10 19.38	08.29 18.02	08.57 15.37	09.54 15.04
22	09.23 16.03	07.59 17.33	06.29 18.49	05.49 21.13	04.22 22.35	03.41 23.25	04.29 22.45	05.52 21.15	07.12 19.35	08.32 17.59	08.59 15.35	09.55 15.04
23	09.21 16.06	07.56 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25	04.31 22.42	05.54 21.12	07.15 19.32	08.35 17.56	09.02 15.32	09.55 15.05
24	09.19 16.09	07.53 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 23.25	04.34 22.40	05.57 21.09	07.18 19.28	08.38 17.53	09.05 15.30	09.56 15.05
25	09.17 16.11	07.49 17.41	06.20 18.57	05.40 21.21	04.15 22.43	03.42 23.25	04.36 22.37	06.00 21.06	07.20 19.25	07.40 16.50	09.07 15.28	09.56 15.06
26	09.14 16.14	07.46 17.44	06.16 19.00	05.36 21.24	04.13 22.45	03.43 23.25	04.39 22.35	06.02 21.03	07.23 19.22	07.43 16.47	09.10 15.26	09.56 15.07
27	09.12 16.17	07.43 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.24	04.42 22.32	06.05 20.59	07.25 19.18	07.46 16.44	09.12 15.24	09.56 15.08
28	09.09 16.20	07.40 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24	04.44 22.29	06.08 20.56	07.28 19.15	07.49 16.41	09.15 15.23	09.56 15.09
29	09.07 16.23	07.37 17.52	06.06 19.08	05.27 21.32	04.07 22.52	03.45 23.23	04.47 22.27	06.10 20.53	07.31 19.12	07.52 16.38	09.17 15.21	09.56 15.10
30	09.04 16.26	07.34 17.57	06.03 19.11	05.24 21.35	04.04 22.55	03.46 23.23	04.50 22.24	06.13 20.50	07.33 19.09	07.54 16.35	09.20 15.19	09.56 15.12
31	09.02 16.29	07.31 17.59	06.00 19.14	05.21 21.38	04.01 22.58	03.44 23.22	04.46 22.26	06.15 20.47	07.36 19.02	07.57 16.32	09.23 15.16	09.55 15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 8 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 9 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720
Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.26-08.48/22	08.00	09.22	
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05		16.29	15.17	
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.26-08.48/22	08.03	09.25	
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02		16.26	15.16	
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.25-08.47/22	08.06	09.27	
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59		16.23	15.14	
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.25-08.46/21	08.09	09.29	
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56		16.20	15.13	
5	09.52	08.48	07.24	07.55-08.04/9	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.26-08.46/20	08.12	09.31
	15.22	16.43	18.03		20.27	21.49	23.07	23.18	22.07	20.30		16.18	15.12	
6	09.50	08.46	07.21	07.52-08.06/14	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.26-08.44/18	08.14	09.33
	15.24	16.46	18.06		20.29	21.52	23.09	23.16	22.04	20.27		16.15	15.10	
7	09.49	08.43	07.18	07.51-08.08/17	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.27-08.43/16	08.17	09.35
	15.26	16.49	18.09		20.32	21.55	23.11	23.15	22.01	20.24		16.12	15.09	
8	09.48	08.40	07.15	07.49-08.08/19	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.29-08.41/12	08.20	09.37
	15.28	16.52	18.12		20.35	21.58	23.12	23.13	21.58	20.21		16.09	15.08	
9	09.47	08.37	07.11	07.48-08.09/21	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.32-08.37/5	08.23	09.39
	15.30	16.55	18.14		20.38	22.00	23.14	23.12	21.55	20.17		16.07	15.07	
10	09.45	08.34	07.08	07.48-08.09/21	06.27	04.55	03.47	04.02	05.19	06.42	07.59		08.26	09.41
	15.32	16.58	18.17		20.40	22.03	23.16	23.10	21.52	20.14		16.04	15.06	
11	09.44	08.32	07.05	07.47-08.08/21	06.24	04.52	03.46	04.04	05.22	06.44	08.02		08.29	09.43
	15.35	17.01	18.20		20.43	22.06	23.17	23.08	21.49	20.11		16.01	15.06	
12	09.43	08.29	07.02	07.47-08.08/21	06.21	04.49	03.45	04.06	05.25	06.47	08.05		08.31	09.44
	15.37	17.04	18.22		20.46	22.09	23.18	23.07	21.46	20.08		15.59	15.05	
13	09.41	08.26	06.59	07.47-08.08/21	06.18	04.46	03.44	04.08	05.27	06.49	08.08		08.34	09.46
	15.39	17.07	18.25		20.48	22.11	23.19	23.05	21.43	20.04		15.56	15.04	
14	09.39	08.23	06.55	07.47-08.07/20	06.14	04.43	03.43	04.10	05.30	06.52	08.10		08.37	09.47
	15.42	17.10	18.28		20.51	22.14	23.21	23.03	21.40	20.01		15.53	15.04	
15	09.37	08.20	06.52	07.48-08.06/18	06.11	04.41	03.42	04.12	05.33	06.54	08.13		08.40	09.48
	15.44	17.12	18.31		20.54	22.17	23.22	23.01	21.37	19.58		15.51	15.04	
16	09.36	08.17	06.49	07.49-08.04/15	06.08	04.38	03.42	04.14	05.35	06.57	08.16		08.43	09.50
	15.47	17.15	18.33		20.57	22.20	23.22	22.59	21.34	19.54		15.48	15.03	
17	09.34	08.14	06.46	07.50-08.01/11	06.05	04.35	03.41	04.17	05.38	07.00	08.18		08.46	09.51
	15.49	17.18	18.36		20.59	22.22	23.23	22.56	21.31	19.51		15.46	15.03	
18	09.32	08.11	06.42		06.02	04.33	03.41	04.19	05.41	07.02	08.21		08.48	09.52
	15.52	17.21	18.39		21.02	22.25	23.24	22.54	21.28	19.48		15.44	15.03	
19	09.30	08.08	06.39		05.58	04.30	03.41	04.21	05.44	07.05	08.24		08.51	09.53
	15.55	17.24	18.41		21.05	22.28	23.24	22.52	21.25	19.45		15.41	15.03	
20	09.28	08.05	06.36		05.55	04.27	03.41	04.24	05.46	07.07	08.27		08.54	09.54
	15.57	17.27	18.44		21.08	22.30	23.25	22.50	21.22	19.41		15.39	15.04	
21	09.26	08.02	06.33		05.52	04.25	03.41	04.26	05.49	07.10	08.29		08.57	09.54
	16.00	17.30	18.47		21.10	22.33	23.25	22.47	21.19	19.38		15.37	15.04	
22	09.23	07.59	06.29		05.49	04.22	03.41	04.29	05.52	07.12	08.32		08.59	09.55
	16.03	17.33	18.49		21.13	22.35	23.25	22.45	21.15	19.35		15.35	15.04	
23	09.21	07.56	06.26		05.46	04.20	03.41	04.31	05.54	07.15	08.35		09.02	09.55
	16.06	17.35	18.52		21.16	22.38	23.25	22.42	21.12	19.32		15.32	15.05	
24	09.19	07.53	06.23		05.43	04.18	03.42	04.34	05.57	07.18	08.38		09.05	09.56
	16.09	17.38	18.55		21.19	22.40	23.25	22.40	21.09	19.28		15.30	15.05	
25	09.17	07.49	06.20		05.40	04.15	03.42	04.36	06.00	07.20	07.40		09.07	09.56
	16.11	17.41	18.57		21.21	22.43	23.25	22.37	21.06	19.25		15.28	15.06	
26	09.14	07.46	06.16		05.36	04.13	03.43	04.39	06.02	07.23	08.34-08.43/9		09.10	09.56
	16.14	17.44	19.00		21.24	22.45	23.25	22.35	21.03	19.22		15.26	15.07	
27	09.12	07.43	06.13		05.33	04.11	03.43	04.42	06.05	07.25	08.31-08.45/14		09.12	09.56
	16.17	17.47	19.03		21.27	22.48	23.25	22.32	20.59	19.18		15.24	15.08	
28	09.09	07.40	06.10		05.30	04.09	03.44	04.44	06.08	07.28	08.29-08.46/17		09.15	09.56
	16.20	17.49	19.05		21.30	22.50	23.24	22.30	20.56	19.15		15.23	15.09	
29	09.07		07.06		05.27	04.07	03.45	04.47	06.10	07.31	08.29-08.47/18		09.17	09.56
	16.23		20.08		21.32	22.53	23.23	22.27	20.53	19.12		15.21	15.10	
30	09.04		07.03		05.24	04.04	03.46	04.50	06.13	07.33	08.27-08.47/20		09.20	09.56
	16.26		20.11		21.35	22.55	23.23	22.24	20.50	19.09		15.19	15.12	
31	09.02		07.00			04.02		04.52	06.15				09.55	
	16.29		20.13			22.57		22.21	20.47				15.13	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166		
Sum of minutes with flicker	0	0	228	0	0	0	0	0	78	158	0	0		

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 10 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (721)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.16	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.58	03.51	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.28
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.54	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.59	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.10	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.38
	15.31	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.48	04.02	05.20	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.37	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.06
13	09.40	08.25	06.58	06.18	04.46	03.45	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.11	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.16	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.51
	15.53	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.56	04.28	03.42	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.42	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.21	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.15	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.50	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.31	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.14
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 WTG: 11 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (722)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.39	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.01	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 12 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (723)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 13 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (724)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.49	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 14 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (725)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.22	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.39	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214 **WTG:** 15 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (726)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 16 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (727)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 17 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (728)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.26
	15.19	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Nykytila_Shadow_No_Forest_20211214WTG: 18 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (729)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.56	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.31	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.26	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.30	04.57	03.48	04.00	05.16	06.39	07.57	08.22	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.39	16.06	15.07
10	09.45	08.34	07.08	06.27	04.54	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.19	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.21	05.43	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.03
20	09.27	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.57	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.22	03.41	04.29	05.51	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.08	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.39	04.15	03.42	04.36	05.59	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.21	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.46	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.07	07.28	07.48	09.14	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.08	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

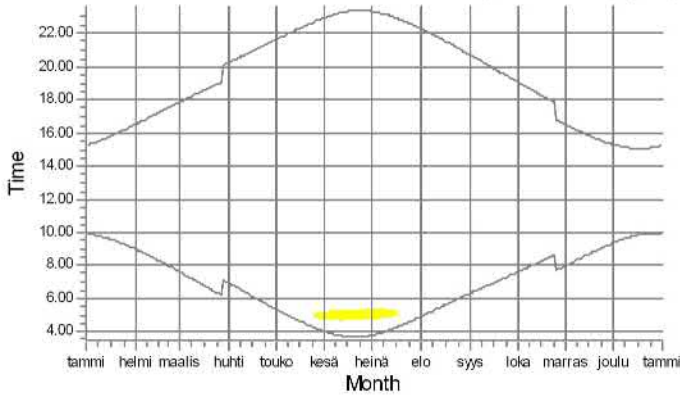
Table layout: For each day in each month the following matrix apply

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

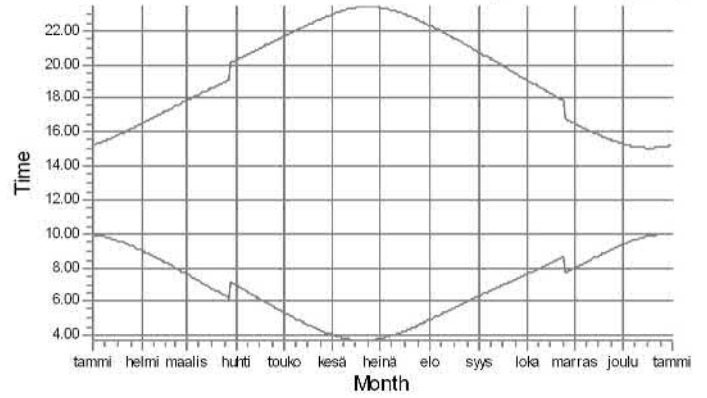
SHADOW - Calendar per WTG, graphical

Calculation: Nykytila_Shadow_No_Forest_20211214

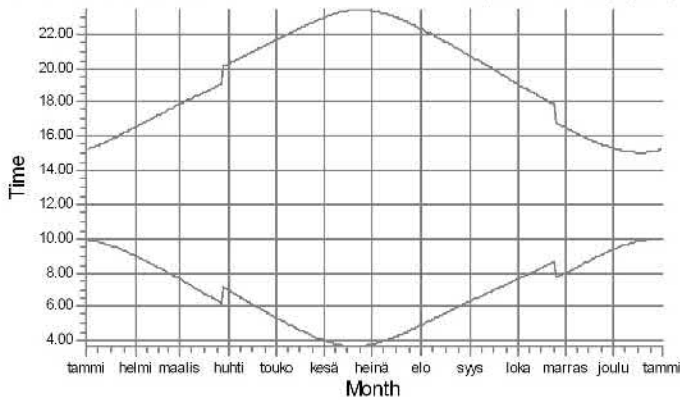
1: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (712)



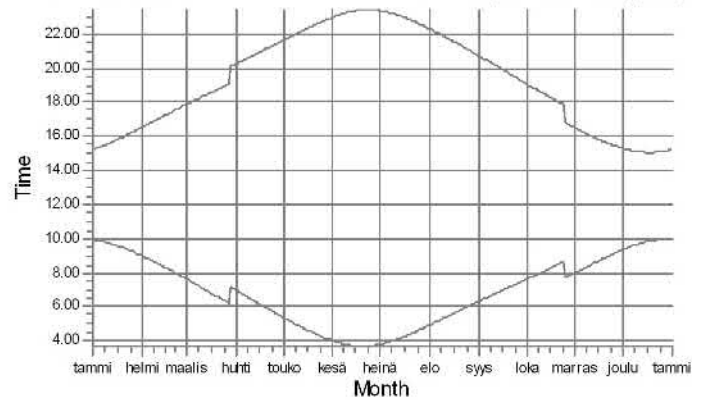
2: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (713)



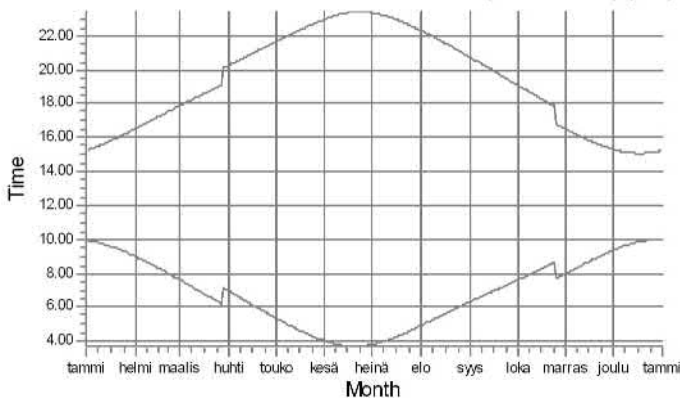
3: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (714)



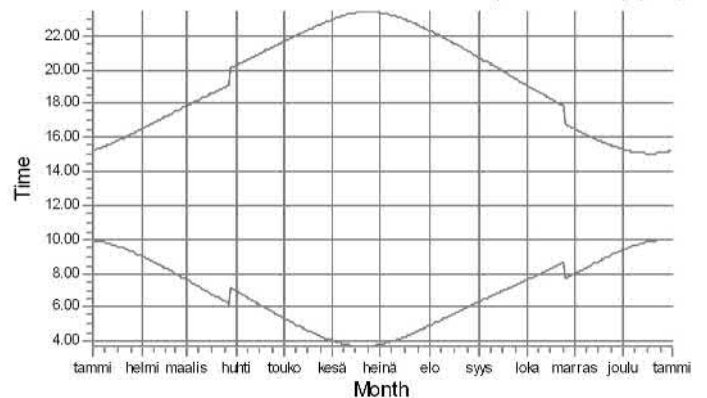
4: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (715)



5: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (716)



6: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (717)



Shadow receptors

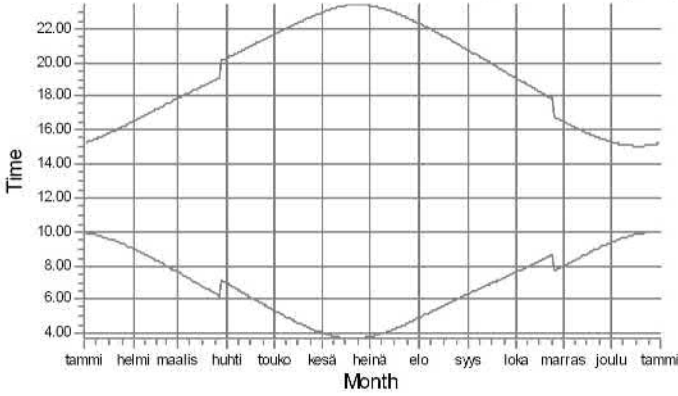


B: Asuinrakennus B, ~Ristoläntie 459

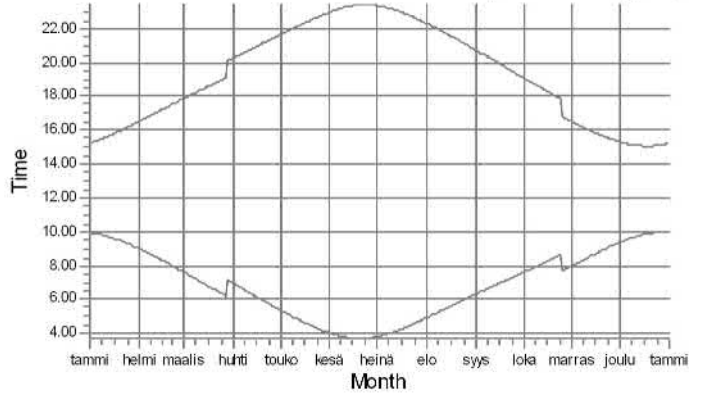
SHADOW - Calendar per WTG, graphical

Calculation: Nykytila_Shadow_No_Forest_20211214

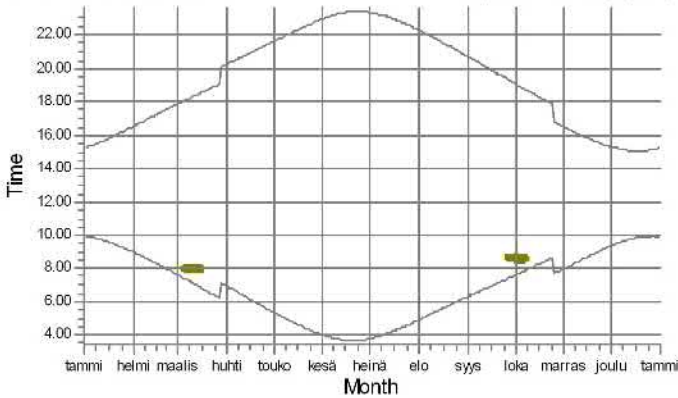
7: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (718)



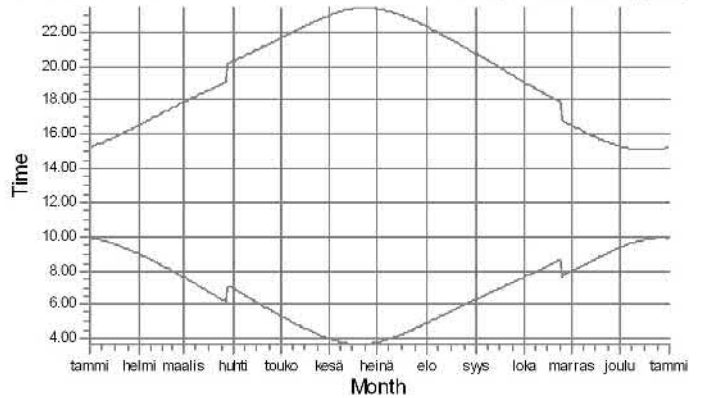
8: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (719)



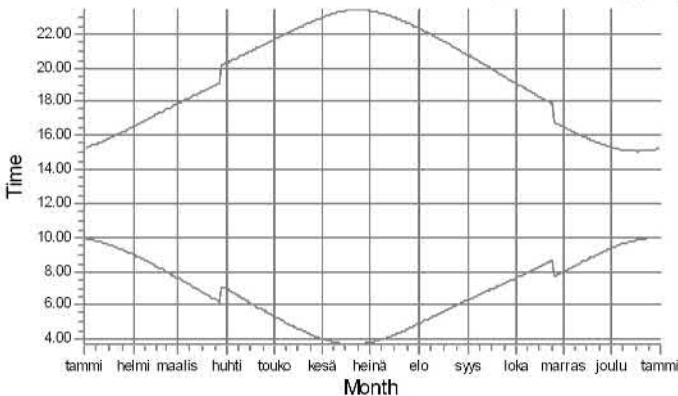
9: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (720)



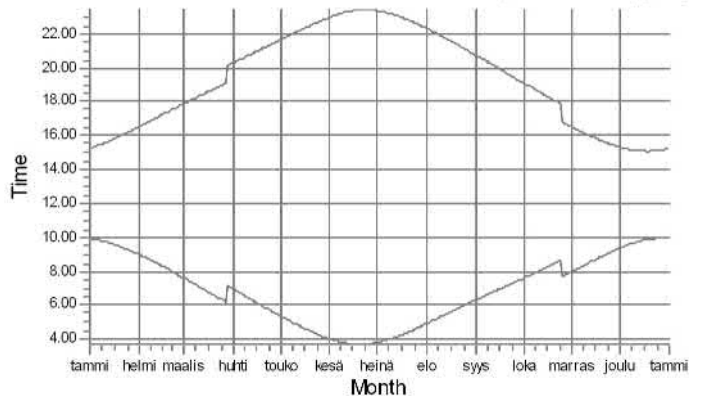
10: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (721)



11: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (722)



12: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (723)



Shadow receptors

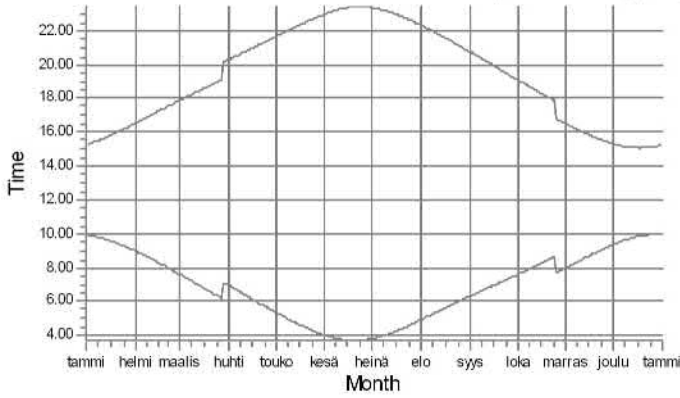


J: Asuinrakennus J, ~Penkkinevantie 85

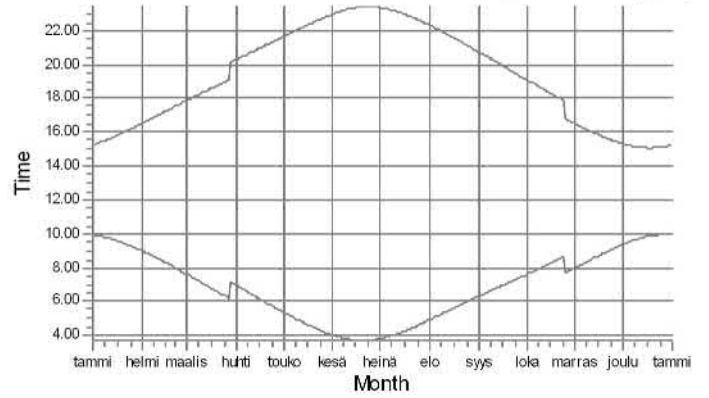
SHADOW - Calendar per WTG, graphical

Calculation: Nykytila_Shadow_No_Forest_20211214

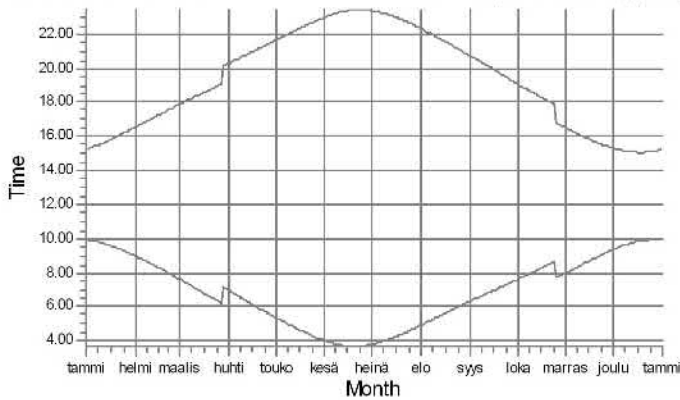
13: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (724



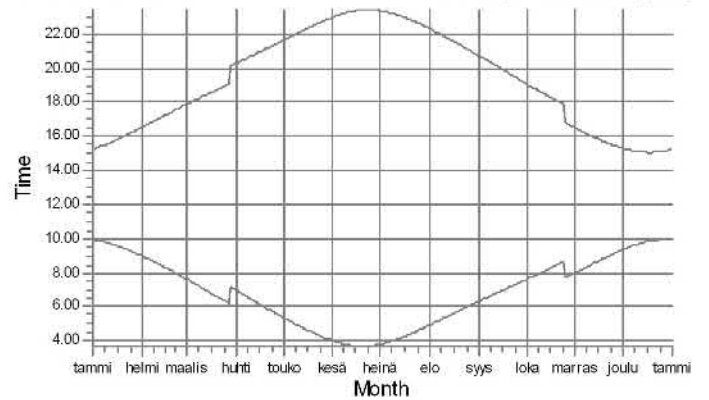
14: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (725



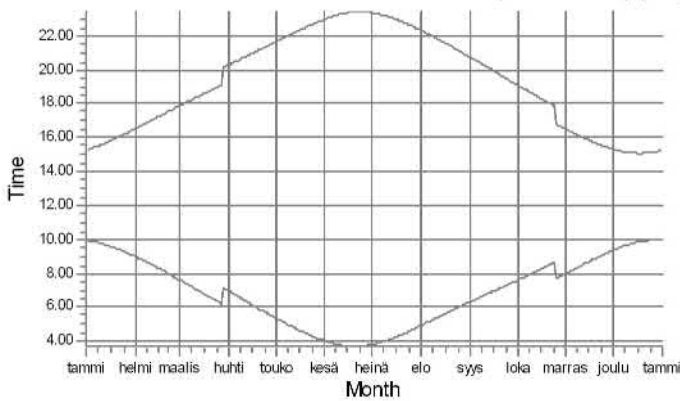
15: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (726



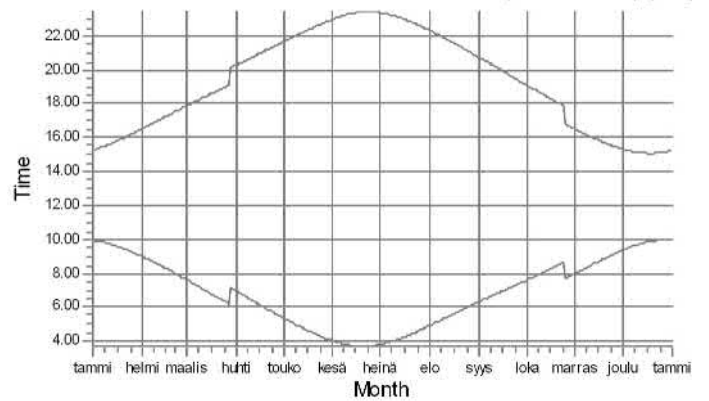
16: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (727



17: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (728



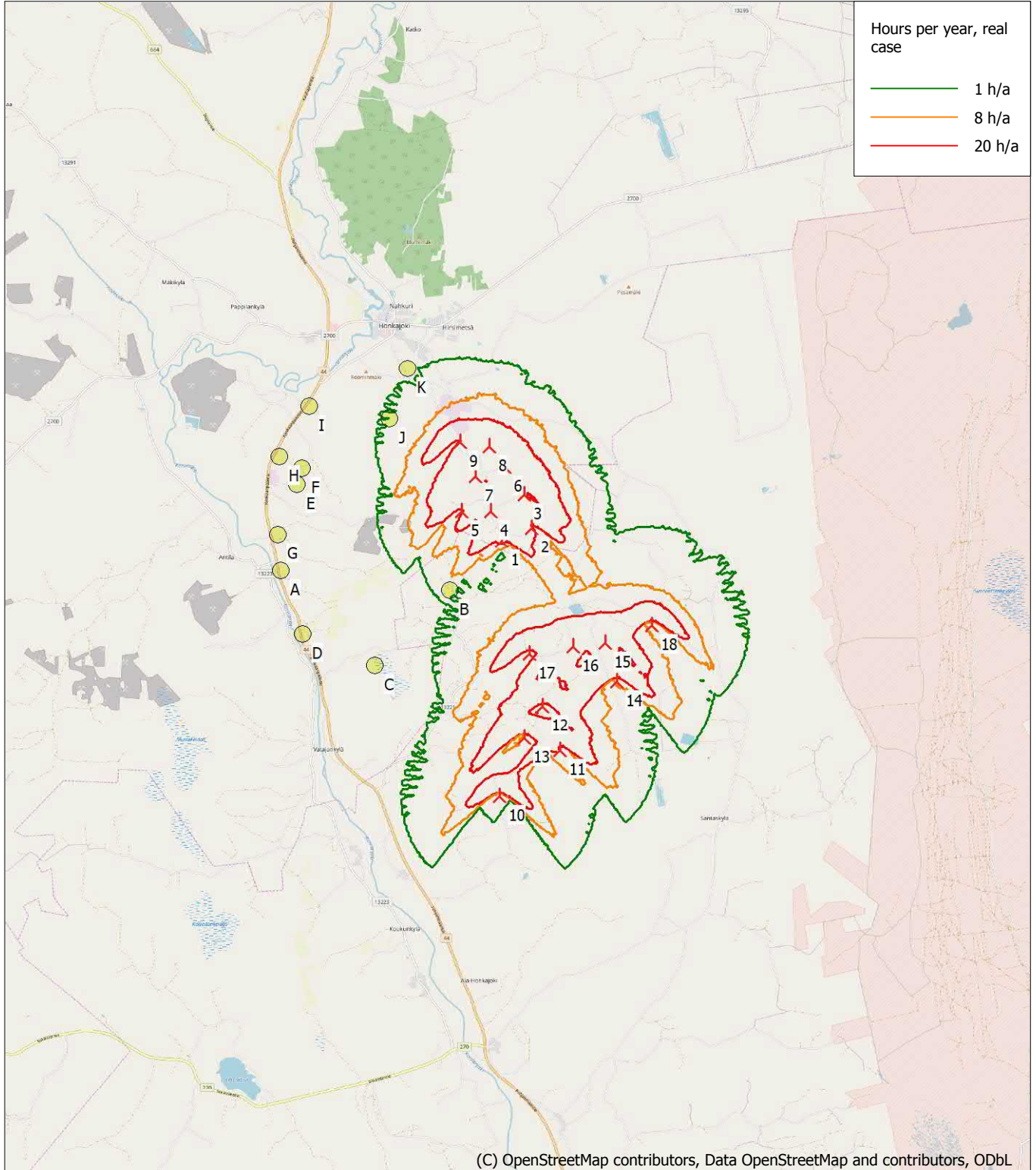
18: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (729



Shadow receptors

SHADOW - Map

Calculation: Nykytila_Shadow_No_Forest_20211214



0 1 2 3 4 km

Map: EMD OpenStreetMap , Print scale 1:100 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 620 North: 6 877 590
 New WTG Shadow receptor
 Flicker map level: Height Contours: CONTOURLINE_EP_Tuulivoimaselvitys_0.wpo (4)

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

29.11.2021 15.33/3.4.388

SHADOW - Main Result

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence

3 °

Day step for calculation

1 days

Time step for calculation

1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

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: CONTOURLINE_EP_Tuulivoimaselvitys

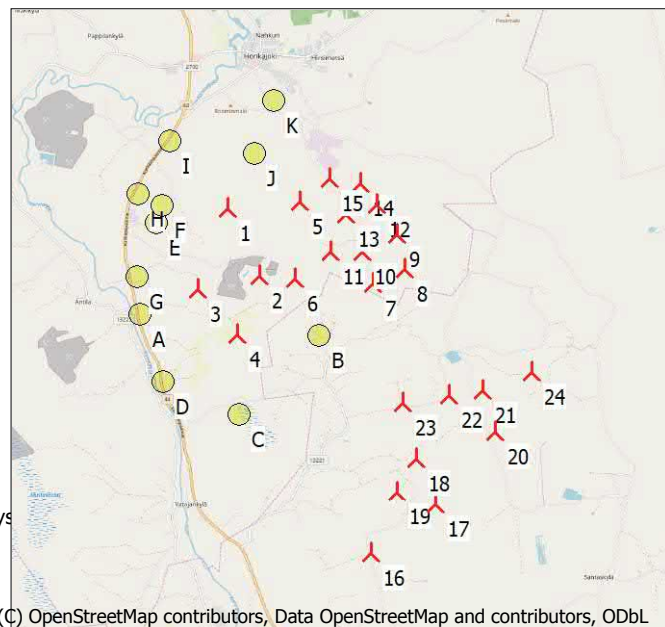
Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:125 000

🚩 New WTG

🟡 Shadow receptor

WTGs

	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	251 304	6 879 975	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
2	251 747	6 878 810	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
3	250 727	6 878 659	100,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
4	251 315	6 877 881	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
5	252 523	6 879 987	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
6	252 334	6 878 721	102,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
7	253 616	6 878 546	105,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
8	254 154	6 878 757	112,2	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
9	254 073	6 879 329	112,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
10	253 487	6 879 084	110,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
11	252 957	6 879 121	107,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
12	253 775	6 879 840	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
13	253 252	6 879 721	117,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
14	253 525	6 880 225	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
15	253 026	6 880 328	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
16	253 256	6 874 086	105,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
17	254 378	6 874 820	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
18	254 139	6 875 605	109,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
19	253 765	6 875 082	105,6	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
20	255 464	6 875 947	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
21	255 305	6 876 650	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
22	254 745	6 876 621	107,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
23	253 975	6 876 541	107,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
24	256 142	6 876 896	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
				[m]	[m]	[m]	a.g.l. [m]	window [°]		(ZVI) a.g.l. [m]
A	Asuinrakennus A, ~Kankaanpääntie 534	249 740	6 878 307	92,4	5,0	5,0	1,0	90,0	"Green house mode"	6,0
B	Asuinrakennus B, ~Ristiläntie 459	252 656	6 877 758	100,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
C	Lomarakennus C, ~Variksentie 93	251 251	6 876 536	93,2	5,0	5,0	1,0	90,0	"Green house mode"	6,0
D	Asuinrakennus D, ~Kankaanpääntie 646	250 034	6 877 181	87,7	5,0	5,0	1,0	90,0	"Green house mode"	6,0

To be continued on next page...

SHADOW - Main Result

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

...continued from previous page

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
E	Asuinrakennus E, ~Välisalontie 130	250 125	6 879 799	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
F	Asuinrakennus F, ~Välisalontie 101	250 226	6 880 083	97,6	5,0	5,0	1,0	90,0	"Green house mode"	6,0
G	Asuinrakennus G, ~Kankaanpääntie 468	249 740	6 878 942	94,8	5,0	5,0	1,0	90,0	"Green house mode"	6,0
H	Lomarakennus H, ~Kankaanpääntie 320	249 856	6 880 304	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
I	Asuinrakennus I, ~Kankaanpääntie 218	250 438	6 881 151	96,3	5,0	5,0	1,0	90,0	"Green house mode"	6,0
J	Asuinrakennus J, ~Penkkinevantie 85	251 819	6 880 838	102,5	5,0	5,0	1,0	90,0	"Green house mode"	6,0
K	Asuinrakennus K, ~Seppäkoskentie 36	252 204	6 881 690	105,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values	
		Shadow hours per year [h/year]	
A	Asuinrakennus A, ~Kankaanpääntie 534	14:49	
B	Asuinrakennus B, ~Ristiläntie 459	7:35	
C	Lomarakennus C, ~Variksentie 93	0:00	
D	Asuinrakennus D, ~Kankaanpääntie 646	7:22	
E	Asuinrakennus E, ~Välisalontie 130	9:33	
F	Asuinrakennus F, ~Välisalontie 101	8:10	
G	Asuinrakennus G, ~Kankaanpääntie 468	12:20	
H	Lomarakennus H, ~Kankaanpääntie 320	3:30	
I	Asuinrakennus I, ~Kankaanpääntie 218	2:04	
J	Asuinrakennus J, ~Penkkinevantie 85	10:37	
K	Asuinrakennus K, ~Seppäkoskentie 36	2:36	

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)	128:38	25:37
2	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690)	38:32	5:04
3	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691)	111:35	22:47
4	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692)	58:32	13:34
5	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (693)	37:10	4:50
6	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (694)	0:00	0:00
7	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712)	16:37	4:19
8	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)	0:00	0:00
9	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714)	0:00	0:00
10	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)	0:00	0:00
11	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716)	0:00	0:00
12	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717)	0:00	0:00
13	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)	0:00	0:00
14	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719)	0:00	0:00
15	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)	7:44	1:19
16	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)	0:00	0:00
17	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)	0:00	0:00
18	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)	0:00	0:00
19	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)	0:00	0:00
20	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)	0:00	0:00
21	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)	0:00	0:00
22	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)	0:00	0:00
23	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)	0:00	0:00
24	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)	0:00	0:00

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.

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	07.37	06.57	08.23 (4)	05.21
	15.15	16.32	17.52	20.16	11 08.34 (4)	21.38
2	09.54	08.57	07.34	06.54		05.18
	15.17	16.35	17.55	20.19		21.41
3	09.53	08.54	07.31	06.50		05.15
	15.19	16.38	17.58	20.22		21.44
4	09.52	08.51	07.28	06.47		05.12
	15.20	16.41	18.01	20.24		21.47
5	09.52	08.49	07.24	06.44		05.09
	15.22	16.44	18.04	20.27		21.49
6	09.50	08.46	07.21	06.41		05.07
	15.24	16.47	18.06	20.30		21.52
7	09.49	08.43	07.18	06.37		05.04
	15.26	16.49	18.09	20.32		21.55
8	09.48	08.40	07.15	06.34		05.01
	15.28	16.52	18.12	20.35		21.58
9	09.47	08.37	07.12	06.31		04.58
	15.31	16.55	18.15	20.38	9 06.20 (3)	03.48
10	09.46	08.35	07.08	06.28		04.55
	15.33	16.58	18.17	20.40	16 06.32 (3)	03.47
11	09.44	08.32	07.05	06.24		04.52
	15.35	17.01	18.20	20.43	19 06.34 (3)	03.46
12	09.43	08.29	07.02	06.21		04.49
	15.37	17.04	18.23	20.46	23 06.35 (3)	03.45
13	09.41	08.26	06.59	06.18		04.46
	15.40	17.07	18.25	20.49	26 06.37 (3)	03.44
14	09.39	08.23	06.56	06.15		04.44
	15.42	17.10	18.28	20.51	28 06.38 (3)	03.44
15	09.38	08.20	06.52	06.12		04.41
	15.45	17.13	18.31	20.54	29 06.38 (3)	03.43
16	09.36	08.17	06.49	06.08		04.38
	15.47	17.16	18.33	20.57	31 06.39 (3)	03.42
17	09.34	08.14	06.46	06.05		04.36
	15.50	17.19	18.36	20.59	32 06.40 (3)	03.42
18	09.32	08.11	06.43	06.02		04.33
	15.53	17.21	18.39	21.02	34 06.07 (3)	03.42
19	09.30	08.08	06.39	05.59		04.30
	15.55	17.24	18.42	21.05	35 06.41 (3)	03.41
20	09.28	08.05	06.36	05.56		04.28
	15.58	17.27	18.44	21.08	36 06.42 (3)	03.41
21	09.26	08.02	06.33	05.52		04.25
	16.01	17.30	18.47	21.10	35 06.42 (3)	03.41
22	09.24	07.59	06.30	05.49		04.23
	16.03	17.33	18.50	21.13	37 06.06 (3)	03.41
23	09.21	07.56	06.26	05.46		04.20
	16.06	17.36	18.52	21.16	37 06.43 (3)	03.42
24	09.19	07.53	06.23	05.43		04.18
	16.09	17.38	18.55	21.19	37 06.06 (3)	03.42
25	09.17	07.50	06.20	05.40		04.16
	16.12	17.41	18.58	21.21	37 06.43 (3)	03.43
26	09.14	07.47	06.17	05.37		04.13
	16.15	17.44	19.00	21.24	39 06.05 (3)	03.43
27	09.12	07.43	06.13	05.34		04.11
	16.17	17.47	19.03	21.27	39 06.44 (3)	03.44
28	09.09	07.40	06.10	05.31		04.09
	16.20	17.50	19.06	21.30	38 06.06 (3)	03.45
29	09.07		07.07	05.28		04.07
	16.23		20.08	21.33	38 06.44 (3)	03.46
30	09.04		07.03	05.25		04.05
	16.26		20.11	21.35	39 06.06 (3)	03.47
31	09.02		07.00	05.21		04.03
	16.29		20.14	08.36 (4)	38 06.44 (3)	03.47
Potential sun hours	194	247	364	443	547	586
Total, worst case			260	11	735	1095
Sun reduction			0,36	0,45	0,50	0,47
Oper. time red.			0,88	0,88	0,88	0,88
Wind dir. red.			0,60	0,60	0,62	0,62
Total reduction			0,19	0,24	0,27	0,26
Total, real			50	3	200	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)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December				
1	03.48	06.13 (3)	04.55	06.24 (3)	06.18	07.36	08.00	09.22		
	23.22	37 06.50 (3)	22.19	22 06.46 (3)	20.44	19.06	16.29	15.18		
2	03.49	06.13 (3)	04.58	06.26 (3)	06.21	07.39	08.03	09.25		
	23.21	37 06.50 (3)	22.16	18 06.44 (3)	20.40	19.02	16.26	15.16		
3	03.50	06.13 (3)	05.01	06.28 (3)	06.24	07.41	08.06	09.27		
	23.20	37 06.50 (3)	22.13	13 06.41 (3)	20.37	18.59	16.24	15.15		
4	03.52	06.13 (3)	05.03	06.33 (3)	06.26	07.44	08.09	09.29		
	23.19	38 06.51 (3)	22.10	4 06.37 (3)	20.34	18.56	16.21	15.13		
5	03.53	06.13 (3)	05.06		06.29	07.46	08.12	09.31		
	23.18	38 06.51 (3)	22.07		20.31	18.53	16.18	15.12		
6	03.55	06.13 (3)	05.09		06.31	07.49	08.14	09.33		
	23.16	38 06.51 (3)	22.04		20.27	18.50	16.15	15.11		
7	03.57	06.14 (3)	05.11		06.34	07.52	08.17	09.35		
	23.15	38 06.52 (3)	22.01		20.24	18.46	16.12	15.10		
8	03.58	06.13 (3)	05.14		06.37	07.54	08.20	09.37		
	23.13	38 06.51 (3)	21.59		20.21	18.43	16.10	15.09		
9	04.00	06.14 (3)	05.17		06.39	07.57	08.23	09.39		
	23.12	38 06.52 (3)	21.56		20.18	18.40	16.07	15.08		
10	04.02	06.13 (3)	05.20		06.42	08.00	08.26	09.41		
	23.10	39 06.52 (3)	21.53		20.14	18.37	16.04	15.07		
11	04.04	06.14 (3)	05.22		06.44	08.16 (4)	08.02	08.29	09.43	
	23.08	38 06.52 (3)	21.50		20.11	10 08.26 (4)	18.34	16.02	15.06	
12	04.06	06.14 (3)	05.25		06.47	08.13 (4)	08.05	08.32	09.44	
	23.07	39 06.53 (3)	21.47		20.08	15 08.28 (4)	18.30	15.59	15.05	
13	04.08	06.14 (3)	05.28		06.50	08.11 (4)	08.08	08.34	09.46	
	23.05	38 06.52 (3)	21.44		20.04	18 08.29 (4)	18.27	15.56	15.05	
14	04.10	06.14 (3)	05.30		06.52	08.10 (4)	08.10	08.37	09.47	
	23.03	39 06.53 (3)	21.40		20.01	20 08.30 (4)	18.24	15.54	15.04	
15	04.13	06.14 (3)	05.33		06.55	08.09 (4)	08.13	08.40	09.48	
	23.01	39 06.53 (3)	21.37		19.58	22 08.31 (4)	18.21	15.51	15.04	
16	04.15	06.15 (3)	05.36		06.57	08.07 (4)	08.16	08.43	09.50	
	22.59	38 06.53 (3)	21.34		19.55	23 08.30 (4)	18.18	15.49	15.04	
17	04.17	06.15 (3)	05.39		07.00	08.07 (4)	08.19	08.46	09.51	
	22.56	39 06.54 (3)	21.31		19.51	24 08.31 (4)	18.15	15.46	15.04	
18	04.19	06.14 (3)	05.41		07.02	08.06 (4)	08.21	08.48	09.52	
	22.54	39 06.53 (3)	21.28		19.48	24 08.30 (4)	18.11	15.44	15.04	
19	04.22	06.15 (3)	05.44		07.05	08.07 (4)	08.24	08.51	09.53	
	22.52	38 06.53 (3)	21.25		19.45	23 08.30 (4)	18.08	15.42	15.04	
20	04.24	06.15 (3)	05.47		07.08	08.06 (4)	08.27	08.54	09.54	
	22.50	37 06.52 (3)	21.22		19.42	22 08.28 (4)	18.05	15.39	15.04	
21	04.27	06.15 (3)	05.49		07.10	08.07 (4)	08.29	08.57	09.54	
	22.47	37 06.52 (3)	21.19		19.38	21 08.28 (4)	18.02	15.37	15.04	
22	04.29	06.16 (3)	05.52		07.13	08.07 (4)	08.32	08.59	09.55	
	22.45	37 06.53 (3)	21.16		19.35	19 08.26 (4)	17.59	15.35	15.05	
23	04.32	06.17 (3)	05.55		07.15	08.08 (4)	08.35	09.02	09.55	
	22.42	36 06.53 (3)	21.12		19.32	17 08.25 (4)	17.56	15.33	15.05	
24	04.34	06.17 (3)	05.57		07.18	08.10 (4)	08.38	09.05	09.56	
	22.40	35 06.52 (3)	21.09		19.29	13 08.23 (4)	17.53	15.31	15.06	
25	04.37	06.17 (3)	06.00		07.20	08.12 (4)	07.41	09.07	09.56	
	22.37	34 06.51 (3)	21.06		19.25	7 08.19 (4)	16.50	15.29	15.07	
26	04.39	06.18 (3)	06.03		07.23		07.43	09.10	09.56	
	22.35	33 06.51 (3)	21.03		19.22		16.47	15.27	15.08	
27	04.42	06.18 (3)	06.05		07.26		07.46	09.13	09.56	
	22.32	32 06.50 (3)	21.00		19.19		16.44	15.25	15.09	
28	04.45	06.20 (3)	06.08		07.28		07.49	09.15	09.56	
	22.30	30 06.50 (3)	20.56		19.15		16.41	15.23	15.10	
29	04.47	06.20 (3)	06.11		07.31		07.52	09.18	09.56	
	22.27	29 06.49 (3)	20.53		19.12		16.38	15.21	15.11	
30	04.50	06.21 (3)	06.13		07.33		07.55	09.20	09.56	
	22.24	27 06.48 (3)	20.50		19.09		16.35	15.20	15.12	
31	04.53	06.22 (3)	06.16				07.57		09.55	
	22.21	24 06.46 (3)	20.47				16.32		15.13	
Potential sun hours	578		495		390		311		215	167
Total, worst case	1116		57		278					
Sun reduction	0,48		0,43		0,36					
Oper. time red.	0,88		0,88		0,88					
Wind dir. red.	0,62		0,62		0,60					
Total reduction	0,26		0,23		0,19					
Total, real	291		13		53					

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** B - Asuinrakennus B, ~Ristoläntie 459
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	January	February	March	April	May	June	
1	09.54	08.59	07.37	06.57	05.21	04.01	04.49 (7)
	15.15	16.32	17.52	20.16	21.38	22.59	16 05.05 (7)
2	09.54	08.56	07.34	06.53	05.18	03.59	04.47 (7)
	15.17	16.35	17.55	20.19	21.41	23.01	19 05.06 (7)
3	09.53	08.54	07.31	06.50	19.17 (4) 05.15	03.57	04.47 (7)
	15.19	16.38	17.58	20.21	7 19.24 (4) 21.43	23.03	19 05.06 (7)
4	09.52	08.51	07.27	06.47	19.13 (4) 05.12	03.56	04.47 (7)
	15.20	16.40	18.01	20.24	14 19.27 (4) 21.46	23.05	20 05.07 (7)
5	09.51	08.48	07.24	06.44	19.10 (4) 05.09	03.54	04.47 (7)
	15.22	16.43	18.03	20.27	19 19.29 (4) 21.49	23.07	21 05.08 (7)
6	09.50	08.46	07.21	06.40	19.08 (4) 05.06	03.52	04.47 (7)
	15.24	16.46	18.06	20.29	22 19.30 (4) 21.52	23.09	21 05.08 (7)
7	09.49	08.43	07.18	06.37	19.07 (4) 05.03	03.51	04.47 (7)
	15.26	16.49	18.09	20.32	24 19.31 (4) 21.55	23.10	22 05.09 (7)
8	09.48	08.40	07.15	06.34	19.06 (4) 05.00	03.50	04.47 (7)
	15.28	16.52	18.12	20.35	26 19.32 (4) 21.57	23.12	22 05.09 (7)
9	09.47	08.37	07.11	06.31	19.05 (4) 04.58	03.48	04.47 (7)
	15.30	16.55	18.14	20.38	27 19.32 (4) 22.00	23.14	22 05.09 (7)
10	09.45	08.34	07.08	06.27	19.05 (4) 04.55	03.47	04.47 (7)
	15.33	16.58	18.17	20.40	27 19.32 (4) 22.03	23.15	22 05.09 (7)
11	09.44	08.32	07.05	06.24	19.04 (4) 04.52	03.46	04.46 (7)
	15.35	17.01	18.20	20.43	29 19.33 (4) 22.06	23.17	23 05.09 (7)
12	09.42	08.29	07.02	06.21	19.03 (4) 04.49	03.45	04.47 (7)
	15.37	17.04	18.22	20.46	28 19.31 (4) 22.08	23.18	23 05.10 (7)
13	09.41	08.26	06.59	06.18	19.03 (4) 04.46	03.44	04.47 (7)
	15.40	17.07	18.25	20.48	28 19.31 (4) 22.11	23.19	23 05.10 (7)
14	09.39	08.23	06.55	06.15	19.03 (4) 04.44	03.43	04.47 (7)
	15.42	17.10	18.28	20.51	28 19.31 (4) 22.14	23.20	24 05.11 (7)
15	09.37	08.20	06.52	06.11	19.03 (4) 04.41	03.43	04.48 (7)
	15.45	17.13	18.31	20.54	27 19.30 (4) 22.17	23.21	23 05.11 (7)
16	09.35	08.17	06.49	06.08	19.03 (4) 04.38	03.42	04.47 (7)
	15.47	17.15	18.33	20.57	26 19.29 (4) 22.19	23.22	24 05.11 (7)
17	09.34	08.14	06.46	06.05	19.04 (4) 04.35	03.42	04.47 (7)
	15.50	17.18	18.36	20.59	24 19.28 (4) 22.22	23.23	24 05.11 (7)
18	09.32	08.11	06.42	06.02	19.05 (4) 04.33	03.41	04.48 (7)
	15.52	17.21	18.39	21.02	22 19.27 (4) 22.25	23.24	24 05.12 (7)
19	09.30	08.08	06.39	05.59	19.06 (4) 04.30	03.41	04.48 (7)
	15.55	17.24	18.41	21.05	20 19.26 (4) 22.27	23.24	24 05.12 (7)
20	09.28	08.05	06.36	05.55	19.07 (4) 04.28	03.41	04.48 (7)
	15.58	17.27	18.44	21.07	17 19.24 (4) 22.30	23.24	24 05.12 (7)
21	09.25	08.02	06.33	05.52	19.10 (4) 04.25	03.41	04.48 (7)
	16.00	17.30	18.47	21.10	12 19.22 (4) 22.33	23.25	24 05.12 (7)
22	09.23	07.59	06.29	05.49	19.15 (4) 04.23	03.41	04.49 (7)
	16.03	17.33	18.49	21.13	1 19.16 (4) 22.35	23.25	24 05.13 (7)
23	09.21	07.56	06.26	05.46	04.20	03.42	04.49 (7)
	16.06	17.35	18.52	21.16	22.38	23.25	24 05.13 (7)
24	09.19	07.53	06.23	05.43	04.18	03.42	04.49 (7)
	16.09	17.38	18.55	21.18	22.40	23.25	24 05.13 (7)
25	09.16	07.49	06.20	05.40	04.16	03.42	04.49 (7)
	16.12	17.41	18.57	21.21	22.43	23.25	24 05.13 (7)
26	09.14	07.46	06.16	05.37	04.13	03.43	04.49 (7)
	16.14	17.44	19.00	21.24	22.45	23.25	24 05.13 (7)
27	09.12	07.43	06.13	05.34	04.11	04.56 (7) 03.44	04.50 (7)
	16.17	17.47	19.03	21.27	22.48	1 04.57 (7) 23.24	23 05.13 (7)
28	09.09	07.40	06.10	05.30	04.09	04.55 (7) 03.45	04.50 (7)
	16.20	17.49	19.05	21.30	22.50	6 05.01 (7) 23.24	24 05.14 (7)
29	09.07	07.37	06.07	05.27	04.07	04.53 (7) 03.45	04.51 (7)
	16.23	07.44	19.08	21.32	22.52	9 05.02 (7) 23.23	23 05.14 (7)
30	09.04	07.33	06.03	05.24	04.05	04.51 (7) 03.47	04.50 (7)
	16.26	07.41	19.11	21.35	22.55	12 05.03 (7) 23.22	23 05.13 (7)
31	09.02	07.30	06.00	05.21	04.03	04.50 (7) 03.47	04.50 (7)
	16.29	07.38	19.14	21.38	22.57	14 05.04 (7) 23.21	23 05.13 (7)
Potential sun hours	194	247	364	443	547	586	
Total, worst case				428		42	677
Sun reduction				0,45		0,50	0,47
Oper. time red.				0,88		0,88	0,88
Wind dir. red.				0,61		0,62	0,62
Total reduction				0,24		0,27	0,26
Total, real				103		12	174

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** B - Asuinrakennus B, ~Ristiläntie 459
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December		
1	03.48	04.51 (7)	04.55	06.18	19.03 (4)	07.36	08.00	09.22
	23.22	23 05.14 (7)	22.18	20.43	28 19.31 (4)	19.05	16.29	15.18
2	03.49	04.51 (7)	04.58	06.21	19.03 (4)	07.38	08.03	09.24
	23.21	23 05.14 (7)	22.16	20.40	27 19.30 (4)	19.02	16.26	15.16
3	03.50	04.52 (7)	05.00	06.23	19.03 (4)	07.41	08.06	09.27
	23.20	23 05.15 (7)	22.13	20.37	27 19.30 (4)	18.59	16.23	15.15
4	03.52	04.52 (7)	05.03	06.26	19.03 (4)	07.44	08.09	09.29
	23.19	22 05.14 (7)	22.10	20.34	26 19.29 (4)	18.56	16.20	15.13
5	03.53	04.52 (7)	05.06	06.29	19.04 (4)	07.46	08.11	09.31
	23.17	22 05.14 (7)	22.07	20.30	24 19.28 (4)	18.53	16.18	15.12
6	03.55	04.53 (7)	05.09	06.31	19.04 (4)	07.49	08.14	09.33
	23.16	21 05.14 (7)	22.04	20.27	22 19.26 (4)	18.49	16.15	15.11
7	03.56	04.54 (7)	05.11	06.34	19.06 (4)	07.52	08.17	09.35
	23.15	20 05.14 (7)	22.01	20.24	19 19.25 (4)	18.46	16.12	15.10
8	03.58	04.54 (7)	05.14	06.36	19.07 (4)	07.54	08.20	09.37
	23.13	20 05.14 (7)	21.58	20.21	15 19.22 (4)	18.43	16.09	15.09
9	04.00	04.55 (7)	05.17	06.39	19.09 (4)	07.57	08.23	09.39
	23.12	19 05.14 (7)	21.55	20.17	9 19.18 (4)	18.40	16.07	15.08
10	04.02	04.55 (7)	05.19	06.42		07.59	08.26	09.41
	23.10	18 05.13 (7)	21.52	20.14		18.37	16.04	15.07
11	04.04	04.56 (7)	05.22	06.44		08.02	08.28	09.42
	23.08	17 05.13 (7)	21.49	20.11		18.33	16.01	15.06
12	04.06	04.57 (7)	05.25	06.47		08.05	08.31	09.44
	23.06	15 05.12 (7)	21.46	20.08		18.30	15.59	15.05
13	04.08	04.59 (7)	05.28	06.49		08.07	08.34	09.45
	23.04	13 05.12 (7)	21.43	20.04		18.27	15.56	15.05
14	04.10	05.01 (7)	05.30	06.52		08.10	08.37	09.47
	23.02	10 05.11 (7)	21.40	20.01		18.24	15.54	15.04
15	04.12	05.03 (7)	05.33	06.54		08.13	08.40	09.48
	23.00	8 05.11 (7)	21.37	19.58		18.21	15.51	15.04
16	04.15	05.04 (7)	05.36	06.57		08.16	08.43	09.49
	22.58	4 05.08 (7)	21.34	19.54		18.18	15.49	15.04
17	04.17		05.38	07.00		08.18	08.45	09.51
	22.56		21.31	19.51		18.14	15.46	15.04
18	04.19		05.41	07.02		08.21	08.48	09.52
	22.54		21.28	19.48		18.11	15.44	15.04
19	04.22		05.44	07.05		08.24	08.51	09.52
	22.52		21.25	19.45		18.08	15.42	15.04
20	04.24		05.46	07.07		08.26	08.54	09.53
	22.49		21.22	19.41		18.05	15.39	15.04
21	04.27		05.49	07.10		08.29	08.56	09.54
	22.47		21.18	6 19.24 (4)	19.38	18.02	15.37	15.04
22	04.29		05.52	19.14 (4)	07.12	08.32	08.59	09.55
	22.45		21.15	13 19.27 (4)	19.35	17.59	15.35	15.05
23	04.32		05.54	19.12 (4)	07.15	08.35	09.02	09.55
	22.42		21.12	17 19.29 (4)	19.32	17.56	15.33	15.05
24	04.34		05.57	19.09 (4)	07.18	08.38	09.05	09.55
	22.40		21.09	21 19.30 (4)	19.28	17.53	15.31	15.06
25	04.37		06.00	19.07 (4)	07.20	07.40	09.07	09.56
	22.37		21.06	23 19.30 (4)	19.25	16.50	15.29	15.07
26	04.39		06.02	19.07 (4)	07.23	07.43	09.10	09.56
	22.35		21.03	24 19.31 (4)	19.22	16.47	15.27	15.07
27	04.42		06.05	19.05 (4)	07.25	07.46	09.12	09.56
	22.32		20.59	26 19.31 (4)	19.18	16.44	15.25	15.08
28	04.44		06.08	19.05 (4)	07.28	07.49	09.15	09.56
	22.29		20.56	27 19.32 (4)	19.15	16.41	15.23	15.09
29	04.47		06.10	19.04 (4)	07.31	07.52	09.17	09.56
	22.27		20.53	28 19.32 (4)	19.12	16.38	15.21	15.11
30	04.50		06.13	19.04 (4)	07.33	07.54	09.20	09.55
	22.24		20.50	28 19.32 (4)	19.09	16.35	15.19	15.12
31	04.52		06.16	19.03 (4)		07.57		09.55
	22.21		20.47	28 19.31 (4)		16.32		15.13
Potential sun hours	578		495	390		311	215	167
Total, worst case	278		241	197				
Sun reduction	0,48		0,43	0,36				
Oper. time red.	0,88		0,88	0,88				
Wind dir. red.	0,62		0,61	0,61				
Total reduction	0,26		0,23	0,19				
Total, real	73		55	38				

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** C - Lomarakennus C, ~Variksentie 93
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.06	16.29	15.18
2	09.54	08.56	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.34	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.10	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.14	20.38	22.00	23.14	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.49
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.55
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** D - Asuinrakennus D, ~Kankaanpääntie 646
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December						
1	09.54	08.59	07.37	06.57	05.22	04.01	05.32 (4)	03.48	05.37 (4)	04.55	06.18	07.36	08.00	09.22				
	15.15	16.32	17.52	20.16	21.38	22.59	27	05.59 (4)	23.22	29	06.06 (4)	22.19	20.44	19.06	16.29	15.18		
2	09.54	08.57	07.34	06.54	05.18	03.59	05.31 (4)	03.49	05.38 (4)	04.58	06.21	07.39	08.03	09.25				
	15.17	16.35	17.55	20.19	21.41	23.01	28	05.59 (4)	23.21	28	06.06 (4)	22.16	20.40	19.02	16.26	15.16		
3	09.53	08.54	07.31	06.50	05.15	03.58	05.32 (4)	03.51	05.38 (4)	05.01	06.24	07.41	08.06	09.27				
	15.19	16.38	17.58	20.22	21.44	23.03	27	05.59 (4)	23.20	28	06.06 (4)	22.13	20.37	18.59	16.24	15.15		
4	09.52	08.51	07.28	06.47	05.12	03.56	05.32 (4)	03.52	05.38 (4)	05.03	06.26	07.44	08.09	09.29				
	15.21	16.41	18.01	20.24	21.46	23.05	28	06.00 (4)	23.19	28	06.06 (4)	22.10	20.34	18.56	16.21	15.14		
5	09.51	08.49	07.24	06.44	05.10	03.54	05.32 (4)	03.53	05.38 (4)	05.06	06.29	07.46	08.12	09.31				
	15.22	16.44	18.04	20.27	21.49	23.07	28	06.00 (4)	23.17	28	06.06 (4)	22.07	20.31	18.53	16.18	15.12		
6	09.50	08.46	07.21	06.41	05.07	03.53	05.32 (4)	03.55	05.39 (4)	05.09	06.31	07.49	08.14	09.33				
	15.24	16.47	18.06	20.30	21.52	23.09	28	06.00 (4)	23.16	28	06.07 (4)	22.04	20.27	18.50	16.15	15.11		
7	09.49	08.43	07.18	06.37	05.04	03.51	05.32 (4)	03.57	05.38 (4)	05.12	06.34	07.52	08.17	09.35				
	15.26	16.49	18.09	20.32	21.55	23.11	28	06.00 (4)	23.15	29	06.07 (4)	22.01	20.24	18.46	16.12	15.10		
8	09.48	08.40	07.15	06.34	05.01	03.50	05.32 (4)	03.58	05.38 (4)	05.14	06.37	07.54	08.20	09.37				
	15.28	16.52	18.12	20.35	21.58	23.12	29	06.01 (4)	23.13	28	06.06 (4)	21.58	20.21	18.43	16.10	15.09		
9	09.47	08.37	07.12	06.31	04.58	03.49	05.32 (4)	04.00	05.39 (4)	05.17	06.39	07.57	08.23	09.39				
	15.31	16.55	18.15	20.38	22.00	23.14	29	06.01 (4)	23.12	28	06.07 (4)	21.55	20.18	18.40	16.07	15.08		
10	09.45	08.35	07.08	06.28	04.55	03.47	05.32 (4)	04.02	05.39 (4)	05.20	06.42	08.00	08.26	09.41				
	15.33	16.58	18.17	20.40	22.03	23.15	29	06.01 (4)	23.10	27	06.06 (4)	21.53	20.14	18.37	16.04	15.07		
11	09.44	08.32	07.05	06.24	04.52	03.46	05.33 (4)	04.04	05.40 (4)	05.22	06.44	08.02	08.29	09.42				
	15.35	17.01	18.20	20.43	22.06	23.17	28	06.01 (4)	23.08	27	06.07 (4)	21.49	20.11	18.34	16.02	15.06		
12	09.42	08.29	07.02	06.21	04.49	03.45	05.33 (4)	04.06	05.40 (4)	05.25	06.47	08.05	08.31	09.44				
	15.37	17.04	18.23	20.46	22.09	23.18	28	06.01 (4)	23.06	27	06.07 (4)	21.46	20.08	18.30	15.59	15.06		
13	09.41	08.26	06.59	06.18	04.47	03.44	05.34 (4)	04.08	05.40 (4)	05.28	06.50	08.08	08.34	09.46				
	15.40	17.07	18.25	20.49	22.11	23.19	28	06.02 (4)	23.05	26	06.06 (4)	21.43	20.04	18.27	15.56	15.05		
14	09.39	08.23	06.56	06.15	04.44	03.44	05.33 (4)	04.10	05.41 (4)	05.30	06.52	08.10	08.37	09.47				
	15.42	17.10	18.28	20.51	22.14	23.20	29	06.02 (4)	23.03	25	06.06 (4)	21.40	20.01	18.24	15.54	15.05		
15	09.37	08.20	06.52	06.12	04.41	03.43	05.34 (4)	04.13	05.41 (4)	05.33	06.55	08.13	08.40	09.48				
	15.45	17.13	18.31	20.54	22.17	23.21	28	06.02 (4)	23.01	25	06.06 (4)	21.37	19.58	18.21	15.51	15.04		
16	09.36	08.17	06.49	06.08	04.38	03.43	05.34 (4)	04.15	05.42 (4)	05.36	06.57	08.16	08.43	09.50				
	15.47	17.16	18.33	20.57	22.19	23.22	29	06.03 (4)	22.58	24	06.06 (4)	21.34	19.55	18.18	15.49	15.04		
17	09.34	08.14	06.46	06.05	04.36	03.42	05.34 (4)	04.17	05.43 (4)	05.39	07.00	08.18	08.46	09.51				
	15.50	17.19	18.36	20.59	22.22	23.23	28	06.02 (4)	22.56	23	06.06 (4)	21.31	19.51	18.15	15.46	15.04		
18	09.32	08.11	06.43	06.02	04.33	03.42	05.34 (4)	04.20	05.43 (4)	05.41	07.02	08.21	08.48	09.52				
	15.53	17.21	18.39	21.02	22.25	23.24	28	06.02 (4)	22.54	23	06.06 (4)	21.28	19.48	18.11	15.44	15.04		
19	09.30	08.08	06.39	05.59	04.30	03.42	05.34 (4)	04.22	05.43 (4)	05.44	07.05	08.24	08.51	09.53				
	15.55	17.24	18.42	21.05	22.27	23.24	28	06.02 (4)	22.52	21	06.04 (4)	21.25	19.45	18.08	15.42	15.04		
20	09.28	08.05	06.36	05.56	04.28	03.41	05.34 (4)	04.24	05.44 (4)	05.47	07.08	08.27	08.54	09.53				
	15.58	17.27	18.44	21.08	22.30	10	05.50 (4)	23.25	29	06.03 (4)	21.22	19.42	18.05	15.39	15.04			
21	09.26	08.02	06.33	05.52	04.25	03.41	05.38 (4)	04.27	05.46 (4)	05.49	07.10	08.29	08.57	09.54				
	16.01	17.30	18.47	21.10	22.33	14	05.52 (4)	23.25	29	06.04 (4)	22.47	18	06.04 (4)	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.30	05.49	04.23	03.42	05.37 (4)	04.29	05.45 (4)	05.42	07.13	08.32	08.59	09.55				
	16.03	17.33	18.50	21.13	22.35	16	05.53 (4)	23.25	29	06.04 (4)	22.45	15	06.02 (4)	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.21	03.42	05.35 (4)	04.32	05.49 (4)	05.55	07.15	08.35	09.02	09.55				
	16.06	17.36	18.52	21.16	22.38	19	05.54 (4)	23.25	28	06.03 (4)	22.42	12	06.01 (4)	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	05.34 (4)	04.34	05.51 (4)	05.57	07.18	08.38	09.05	09.56				
	16.09	17.38	18.55	21.19	22.40	21	05.55 (4)	23.25	28	06.04 (4)	22.40	7	05.58 (4)	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	05.34 (4)	04.37	05.58 (4)	06.00	07.20	07.40	09.07	09.56				
	16.12	17.41	18.58	21.21	22.43	21	05.55 (4)	23.25	28	06.04 (4)	22.37	21.06	19.25	16.50	15.29	15.07		
26	09.14	07.46	06.16	05.37	04.14	03.43	05.33 (4)	04.39	06.03 (4)	06.03	07.23	07.43	09.10	09.56				
	16.15	17.44	19.00	21.24	22.45	23	05.56 (4)	23.25	29	06.05 (4)	22.35	21.03	19.22	16.47	15.27	15.08		
27	09.12	07.43	06.13	05.34	04.11	03.44	05.32 (4)	04.42	06.05 (4)	06.05	07.26	07.46	09.12	09.56				
	16.17	17.47	19.03	21.27	22.48	24	05.56 (4)	23.24	28	06.04 (4)	22.32	21.00	19.19	16.44	15.25	15.09		
28	09.09	07.40	06.10	05.31	04.09	03.45	05.33 (4)	04.45	06.08 (4)	06.08	07.28	07.49	09.15	09.56				
	16.20	17.50	19.06	21.30	22.50	24	05.57 (4)	23.24	29	06.05 (4)	22.30	20.56	19.15	16.41	15.23	15.10		
29	09.07	07.07	05.28	04.07	03.46	03.46	05.32 (4)	04.47	06.11 (4)	06.11	07.31	07.52	09.17	09.56				
	16.23	18.08	21.32	22.52	25	05.57 (4)	23.23	28	06.05 (4)	22.27	20.53	19.12	16.38	15.21	15.11			
30	09.04	07.03	05.25	04.05	03.47	03.47	05.32 (4)	04.50	06.13 (4)	06.13	07.33	07.55	09.20	09.55				
	16.26	18.11	21.35	22.55	26	05.58 (4)	23.23	29	06.06 (4)	22.24	20.50	19.09	16.35	15.20	15.12			
31	09.02	07.00	04.03	03.47	03.47	03.47	05.32 (4)	04.53	06.16 (4)	06.16	07.57	07.57	09.55					
	16.29	18.14	22.57	26	05.58 (4)	22.21	22.21	20.47	16.32	15.14								
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167						
Total, worst case					249	849	573											
Sun reduction					0,50	0,47	0,48											
Oper. time red.					0,88	0,88	0,88											
Wind dir. red.					0,63	0,63	0,63											
Total reduction					0,28	0,26	0,27											
Total, real					69	221	152											

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)

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	10.25 (3)	07.37	08.24 (2)	06.57
	15.15	16.32	17	10.42 (3)	17.52	18
2	09.54	08.57	10.23 (3)	07.34	08.23 (2)	06.54
	15.17	16.35	21	10.44 (3)	17.55	18
3	09.53	08.54	10.22 (3)	07.31	08.22 (2)	06.50
	15.19	16.38	23	10.45 (3)	17.58	20
4	09.53	08.51	10.21 (3)	07.28	08.22 (2)	06.47
	15.20	16.41	25	10.46 (3)	18.01	20
5	09.52	08.49	10.20 (3)	07.24	08.21 (2)	06.44
	15.22	16.44	27	10.47 (3)	18.04	21
6	09.51	08.46	10.20 (3)	07.21	08.22 (2)	06.41
	15.24	16.46	28	10.48 (3)	18.06	19
7	09.50	08.43	10.20 (3)	07.18	08.22 (2)	06.37
	15.26	16.49	29	10.49 (3)	18.09	19
8	09.48	08.40	10.19 (3)	07.15	08.22 (2)	06.34
	15.28	16.52	29	10.48 (3)	18.12	17
9	09.47	08.38	10.19 (3)	07.12	08.24 (2)	06.31
	15.30	16.55	30	10.49 (3)	18.15	14
10	09.46	08.35	10.19 (3)	07.08	08.26 (2)	06.28
	15.33	16.58	30	10.49 (3)	18.17	10
11	09.44	08.32	10.19 (3)	07.05	08.36 (2)	06.24
	15.35	17.01	31	10.50 (3)	18.20	
12	09.43	08.29	10.20 (3)	07.02	06.21	20.43
	15.37	17.04	30	10.50 (3)	18.23	20.46
13	09.41	08.26	10.19 (3)	06.59	06.18	20.46
	15.40	17.07	30	10.49 (3)	18.25	20.49
14	09.39	08.23	10.20 (3)	06.56	06.15	20.49
	15.42	17.10	29	10.49 (3)	18.28	06.15
15	09.38	08.20	10.21 (3)	06.52	06.12	20.51
	15.45	17.13	28	10.49 (3)	18.31	06.12
16	09.36	08.17	10.21 (3)	06.49	06.08	20.54
	15.47	17.16	26	10.47 (3)	18.33	20.54
17	09.34	08.14	10.22 (3)	06.46	06.05	20.57
	15.50	17.18	24	10.46 (3)	18.36	06.05
18	09.32	08.11	10.23 (3)	06.43	06.02	21.00
	15.52	17.21	22	10.45 (3)	18.39	06.02
19	09.30	08.08	10.25 (3)	06.39	05.59	21.02
	15.55	17.24	19	10.44 (3)	18.42	21.02
20	09.28	08.05	10.26 (3)	06.36	05.56	21.05
	15.58	17.27	15	10.41 (3)	18.44	21.05
21	09.26	08.02	10.31 (3)	06.33	05.52	21.08
	16.00	17.30	5	10.36 (3)	18.47	05.52
22	09.24	07.59		06.30	05.49	06.59 (1)
	16.03	17.33		18.50	21.13	06.56 (1)
23	09.21	07.56		06.26	05.46	07.13 (1)
	16.06	17.36		18.52	21.16	06.54 (1)
24	09.19	07.53		06.23	05.43	06.54 (1)
	16.09	17.38		18.55	21.19	07.15 (1)
25	09.17	07.50		06.20	05.40	06.52 (1)
	16.12	17.41		18.58	21.22	07.16 (1)
26	09.14	07.47	08.32 (2)	06.16	05.37	06.51 (1)
	16.14	17.44	4	08.36 (2)	19.00	06.50 (1)
27	09.12	07.43	08.27 (2)	06.13	05.34	07.18 (1)
	16.17	17.47	11	08.38 (2)	19.03	06.49 (1)
28	09.10	07.40	08.25 (2)	06.10	05.31	07.19 (1)
	16.20	17.50	15	08.40 (2)	19.06	06.48 (1)
29	09.07			07.07	05.27	04.09
	16.23			20.08	21.30	07.19 (1)
30	09.05	10.30 (3)		07.03	05.24	06.47 (1)
	16.26	7	10.37 (3)	20.11	21.35	07.19 (1)
31	09.02	10.26 (3)		07.00		04.05
	16.29	14	10.40 (3)	20.14		22.55
Potential sun hours	194	247	364	443	547	586
Total, worst case	21	548	176	254	443	
Sun reduction	0,16	0,32	0,36	0,45	0,50	
Oper. time red.	0,88	0,88	0,88	0,88	0,88	
Wind dir. red.	0,66	0,66	0,62	0,59	0,59	
Total reduction	0,09	0,19	0,20	0,24	0,26	
Total, real	2	103	35	60	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)
	Minutes with flicker		

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	07.00 (1)	06.18	07.36	08.00
	23.22	22.19	25 07.25 (1)	20.44	19.06	16.29
2	03.49	04.58	06.59 (1)	06.21	07.39	08.03
	23.21	22.16	27 07.26 (1)	20.40	19.02	16.26
3	03.50	05.01	06.58 (1)	06.24	07.41	08.06
	23.20	22.13	28 07.26 (1)	20.37	18.59	8 09.12 (2)
4	03.52	05.03	06.58 (1)	06.26	07.44	08.09
	23.19	22.10	30 07.28 (1)	20.34	18.56	13 09.15 (2)
5	03.53	05.06	06.57 (1)	06.29	07.46	08.12
	23.18	22.07	31 07.28 (1)	20.31	18.53	16 09.16 (2)
6	03.55	05.09	06.56 (1)	06.31	07.49	08.15
	23.16	22.04	32 07.28 (1)	20.27	18.50	18 09.16 (2)
7	03.56	05.11	06.56 (1)	06.34	07.52	08.17
	23.15	22.02	32 07.28 (1)	20.24	18.46	19 09.17 (2)
8	03.58	05.14	06.56 (1)	06.37	07.54	08.20
	23.14	21.59	32 07.28 (1)	20.21	18.43	20 09.17 (2)
9	04.00	05.17	06.56 (1)	06.39	07.57	08.23
	23.12	21.56	33 07.29 (1)	20.18	18.40	20 09.17 (2)
10	04.02	05.19	06.55 (1)	06.42	08.00	08.26
	23.10	21.53	33 07.28 (1)	20.14	18.37	20 09.17 (2)
11	04.04	05.22	06.55 (1)	06.44	08.02	08.29
	23.09	21.50	33 07.28 (1)	20.11	18.33	20 09.16 (2)
12	04.06	05.25	06.55 (1)	06.47	08.05	08.32
	23.07	21.47	33 07.28 (1)	20.08	18.30	18 09.15 (2)
13	04.08	05.28	06.55 (1)	06.50	08.08	08.34
	23.05	21.44	32 07.27 (1)	20.04	18.27	16 09.14 (2)
14	04.10	05.30	06.56 (1)	06.52	08.10	08.37
	23.03	21.41	31 07.27 (1)	20.01	18.24	13 09.12 (2)
15	04.12	05.33	06.56 (1)	06.55	08.13	08.40
	23.01	21.37	30 07.26 (1)	19.58	18.21	9 09.10 (2)
16	04.15	05.36	06.57 (1)	06.57	08.16	08.43
	22.59	21.34	29 07.26 (1)	19.55	18.18	15.49
17	04.17	05.38	06.57 (1)	07.00	08.19	08.46
	22.57	21.31	28 07.25 (1)	19.51	18.15	15.46
18	04.19	05.41	06.57 (1)	07.02	08.21	08.49
	22.54	21.28	26 07.23 (1)	19.48	18.11	15.44
19	04.22	05.44	06.59 (1)	07.05	08.24	08.51
	22.52	21.25	23 07.22 (1)	19.45	18.08	15.42
20	04.24	05.47	06.59 (1)	07.08	08.27	08.54
	22.50	21.22	21 07.20 (1)	19.42	18.05	15.39
21	04.27	05.49	07.02 (1)	07.10	08.29	08.57
	22.47	21.19	17 07.19 (1)	19.38	18.02	9 11.09 (3)
22	04.29	05.52	07.04 (1)	07.13	08.32	09.00
	22.45	21.16	11 07.15 (1)	19.35	17.59	15 11.12 (3)
23	04.32	05.55		07.15	08.35	09.02
	22.43	21.12		19.32	17.56	20 11.14 (3)
24	04.34	05.57		07.18	08.38	09.05
	22.40	21.09		19.28	17.53	23 11.16 (3)
25	04.37	06.00		07.20	07.41	09.07
	22.38	21.06		19.25	16.50	25 10.17 (3)
26	04.39	06.03		07.23	07.43	09.10
	22.35	21.03		19.22	16.47	26 10.17 (3)
27	04.42	07.07 (1)	06.05	07.26	07.46	09.13
	22.32	10 07.17 (1)	21.00	19.19	16.44	28 10.18 (3)
28	04.44	07.04 (1)	06.08	07.28	07.49	09.15
	22.30	15 07.19 (1)	20.56	19.15	16.41	29 10.18 (3)
29	04.47	07.04 (1)	06.10	07.31	07.52	09.18
	22.27	17 07.21 (1)	20.53	19.12	16.38	30 10.18 (3)
30	04.50	07.02 (1)	06.13	07.33	07.55	09.20
	22.24	21 07.23 (1)	20.50	19.09	16.35	30 10.19 (3)
31	04.52	07.01 (1)	06.16		07.57	09.49 (3)
	22.22	23 07.24 (1)	20.47		16.32	30 10.19 (3)
Potential sun hours	579	495	390	311	215	166
Total, worst case	86	617			475	278
Sun reduction	0,48	0,43			0,25	0,16
Oper. time red.	0,88	0,88			0,88	0,88
Wind dir. red.	0,59	0,59			0,64	0,66
Total reduction	0,25	0,23			0,14	0,10
Total, real	22	139			69	27

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** F - Asuinrakennus F, ~Välisalontie 101
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 16.32	26 11.19 (3)	07.37 17.52	06.57 20.16	05.21 21.38
2	09.54 15.17	08.57 16.35	26 11.19 (3)	07.34 17.55	06.54 20.19	05.18 21.41
3	09.53 15.18	08.54 16.38	25 11.18 (3)	07.31 17.58	06.50 20.22	05.15 21.44
4	09.53 15.20	08.51 16.41	24 11.18 (3)	07.28 18.01	06.47 20.24	05.12 21.44
5	09.52 15.22	08.49 16.43	23 11.18 (3)	07.24 18.04	06.44 20.27	05.09 21.49
6	09.51 15.24	08.46 16.46	21 11.17 (3)	07.21 18.06	06.41 20.30	05.06 21.52
7	09.50 15.26	08.43 16.49	19 11.16 (3)	07.18 18.09	06.37 20.32	05.03 21.55
8	09.48 15.28	08.40 16.52	16 11.14 (3)	07.15 18.12	06.34 20.35	05.01 21.58
9	09.47 15.30	08.38 16.55	12 11.12 (3)	07.12 18.14	06.31 20.38	04.58 22.01
10	09.46 15.33	08.35 16.58		07.08 18.17	06.28 20.40	04.55 22.03
11	09.44 15.35	08.32 17.01		07.05 18.20	06.24 20.43	04.52 22.06
12	09.43 15.37	08.29 17.04		07.02 18.23	06.21 20.46	04.49 22.09
13	09.41 15.40	08.26 17.07		06.59 18.25	06.18 20.49	04.46 22.12
14	09.39 15.42	08.23 17.10		06.56 18.28	06.15 20.51	04.44 22.14
15	09.38 15.45	08.20 17.13		06.52 18.31	06.12 20.54	04.41 22.17
16	09.36 15.47	08.17 17.16	5 09.07 (2)	06.49 18.33	06.08 20.57	04.38 22.20
17	09.34 15.50	08.14 17.18	11 09.10 (2)	06.46 18.36	06.05 21.00	04.35 22.22
18	09.32 15.52	11.00 (3) 17.21	15 09.12 (2)	06.43 18.39	06.02 21.02	04.33 22.25
19	09.30 15.55	10.57 (3) 17.24	16 09.13 (2)	06.39 18.42	05.59 21.05	04.30 22.28
20	09.28 15.58	11.08 (3) 17.27	18 09.15 (2)	06.36 18.44	05.56 21.08	04.28 22.30
21	09.26 16.00	10.54 (3) 17.30	19 09.14 (2)	06.33 18.47	05.52 21.10	04.25 22.33
22	09.24 16.03	11.11 (3) 17.33	19 09.14 (2)	06.30 18.50	05.49 21.13	04.23 22.36
23	09.21 16.06	10.53 (3) 17.36	20 09.14 (2)	06.26 18.52	05.46 21.16	04.20 22.38
24	09.19 16.09	11.14 (3) 17.38	20 09.14 (2)	06.23 18.55	05.43 21.19	04.18 22.41
25	09.17 16.12	10.52 (3) 17.41	18 09.13 (2)	06.20 18.58	05.40 21.22	04.16 22.43
26	09.14 16.14	11.15 (3) 17.44	17 09.13 (2)	06.16 19.00	05.37 21.24	04.13 22.46
27	09.12 16.17	10.52 (3) 17.47	15 09.11 (2)	06.13 19.03	05.34 21.27	04.11 22.48
28	09.10 16.20	11.17 (3) 17.50	11 09.09 (2)	06.10 19.06	05.31 21.30	04.09 22.50
29	09.07 16.23	10.52 (3) 17.53		07.07 20.08	05.27 21.33	04.07 22.53
30	09.05 16.26	11.18 (3) 17.56		07.03 20.11	05.24 21.35	04.05 22.55
31	09.02 16.29	10.52 (3) 17.59		07.00 20.14	05.21 21.38	04.03 22.57
Potential sun hours	194	247	364	443	547	586
Total, worst case	286	396			669	
Sun reduction	0,16	0,32			0,45	
Oper. time red.	0,88	0,88			0,88	
Wind dir. red.	0,66	0,65			0,61	
Total reduction	0,10	0,19			0,24	
Total, real	27	73			163	

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** F - Asuinrakennus F, ~Välisalontie 101
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.42 (1)	07.36	08.00
	23.22	22.19	20.44	33 08.15 (1)	19.06	16.29
2	03.49	04.58	06.21	07.42 (1)	07.39	08.03
	23.21	22.16	20.40	32 08.14 (1)	19.02	16.26
3	03.50	05.00	06.24	07.43 (1)	07.41	08.06
	23.20	22.13	20.37	30 08.13 (1)	18.59	16.23
4	03.52	05.03	06.26	07.43 (1)	07.44	08.09
	23.19	22.10	20.34	29 08.12 (1)	18.56	16.21
5	03.53	05.06	06.29	07.44 (1)	07.46	08.12
	23.18	22.07	20.31	27 08.11 (1)	18.53	16.18
6	03.55	05.09	06.31	07.45 (1)	07.49	08.15
	23.16	22.05	20.27	24 08.09 (1)	18.49	16.15
7	03.56	05.11	06.34	07.47 (1)	07.52	08.17
	23.15	22.02	20.24	20 08.07 (1)	18.46	16.12
8	03.58	05.14	06.37	07.49 (1)	07.54	08.20
	23.14	21.59	20.21	14 08.03 (1)	18.43	16.09
9	04.00	05.17	06.39	07.55 (1)	07.57	08.23
	23.12	21.56	20.18	3 07.58 (1)	18.40	16.07
10	04.02	05.19	06.42	08.00	08.26	10.23 (3)
	23.10	21.53	20.14	18.37	16.04	27 10.50 (3)
11	04.04	05.22	06.44	08.02	08.29	10.23 (3)
	23.09	21.50	20.11	18.33	16.01	27 10.50 (3)
12	04.06	05.25	06.47	08.05	08.32	10.24 (3)
	23.07	21.47	20.08	18.30	15.59	26 10.50 (3)
13	04.08	05.28	06.50	08.08	08.35	10.24 (3)
	23.05	21.44	20.04	18.27	6 09.33 (2)	15.56
14	04.10	05.30	06.52	08.10	08.37	10.25 (3)
	23.03	21.41	20.01	18.24	12 09.42 (2)	15.54
15	04.12	05.33	06.55	08.13	09.29 (2)	08.40
	23.01	21.37	19.58	18.21	15 09.44 (2)	15.51
16	04.15	05.36	07.58 (1)	06.57	08.16	09.28 (2)
	22.59	21.34	9 08.07 (1)	19.55	18.18	17 09.45 (2)
17	04.17	05.38	07.54 (1)	07.00	08.19	09.27 (2)
	22.57	21.31	16 08.10 (1)	19.51	18.15	18 09.45 (2)
18	04.19	05.41	07.51 (1)	07.02	08.21	09.26 (2)
	22.54	21.28	21 08.12 (1)	19.48	18.11	20 09.46 (2)
19	04.22	05.44	07.50 (1)	07.05	08.24	09.26 (2)
	22.52	21.25	24 08.14 (1)	19.45	18.08	20 09.46 (2)
20	04.24	05.46	07.48 (1)	07.08	08.27	09.26 (2)
	22.50	21.22	27 08.15 (1)	19.42	18.05	19 09.45 (2)
21	04.27	05.49	07.47 (1)	07.10	08.29	09.26 (2)
	22.47	21.19	29 08.16 (1)	19.38	18.02	19 09.45 (2)
22	04.29	05.52	07.46 (1)	07.13	08.32	09.26 (2)
	22.45	21.16	30 08.16 (1)	19.35	17.59	18 09.44 (2)
23	04.32	05.55	07.46 (1)	07.15	08.35	09.27 (2)
	22.43	21.12	31 08.17 (1)	19.32	17.56	16 09.43 (2)
24	04.34	05.57	07.44 (1)	07.18	08.38	09.28 (2)
	22.40	21.09	33 08.17 (1)	19.28	17.53	14 09.42 (2)
25	04.37	06.00	07.44 (1)	07.20	07.41	08.30 (2)
	22.38	21.06	34 08.18 (1)	19.25	16.50	10 08.40 (2)
26	04.39	06.03	07.43 (1)	07.23	07.43	08.34 (2)
	22.35	21.03	35 08.18 (1)	19.22	16.47	1 08.35 (2)
27	04.42	06.05	07.43 (1)	07.26	07.46	09.13
	22.32	21.00	35 08.18 (1)	19.19	16.44	15.25
28	04.44	06.08	07.42 (1)	07.28	07.49	09.15
	22.30	20.56	36 08.18 (1)	19.15	16.41	15.23
29	04.47	06.10	07.41 (1)	07.31	07.52	09.18
	22.27	20.53	36 08.17 (1)	19.12	16.38	15.21
30	04.50	06.13	07.42 (1)	07.33	07.55	09.20
	22.24	20.50	35 08.17 (1)	19.09	16.35	15.19
31	04.52	06.16	07.41 (1)	07.36	07.57	09.22
	22.22	20.47	35 08.16 (1)	19.06	16.32	15.13
Potential sun hours	579	495	390	311	215	166
Total, worst case		466	212	205	489	
Sun reduction		0,43	0,36	0,25	0,16	
Oper. time red.		0,88	0,88	0,88	0,88	
Wind dir. red.		0,61	0,61	0,63	0,66	
Total reduction		0,23	0,20	0,14	0,10	
Total, real		108	42	29	47	

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June				
1	09.55	08.59	07.37	08.32 (4)	06.57	07.38 (2)	05.21	04.01	05.13 (1)	
	15.15	16.32	17.52	21 08.53 (4)	20.16	53 08.58 (3)	21.38	22.59	20 05.33 (1)	
2	09.54	08.57	07.34	08.31 (4)	06.54	07.36 (2)	05.18	03.59	05.12 (1)	
	15.17	16.35	17.55	21 08.52 (4)	20.19	55 08.57 (3)	21.41	23.01	21 05.33 (1)	
3	09.53	08.54	07.31	08.32 (4)	06.50	07.35 (2)	05.15	03.57	05.12 (1)	
	15.19	16.38	17.58	20 08.52 (4)	20.22	56 08.57 (3)	21.44	23.03	21 05.33 (1)	
4	09.53	08.51	07.28	08.32 (4)	06.47	07.35 (2)	05.12	03.56	05.12 (1)	
	15.20	16.41	18.01	19 08.51 (4)	20.24	56 08.57 (3)	21.47	23.05	22 05.34 (1)	
5	09.52	08.49	07.24	08.32 (4)	06.44	07.35 (2)	05.09	03.54	05.13 (1)	
	15.22	16.44	18.04	18 08.50 (4)	20.27	55 08.56 (3)	21.49	23.07	21 05.34 (1)	
6	09.51	08.46	07.21	08.33 (4)	06.41	07.35 (2)	05.06	03.52	05.13 (1)	
	15.24	16.47	18.06	16 08.49 (4)	20.30	55 08.56 (3)	21.52	23.09	22 05.35 (1)	
7	09.49	08.43	07.18	08.35 (4)	06.37	07.35 (2)	05.04	03.51	05.13 (1)	
	15.26	16.49	18.09	12 08.47 (4)	20.32	51 08.54 (3)	21.55	23.11	22 05.35 (1)	
8	09.48	08.40	07.15	08.37 (4)	06.34	07.35 (2)	05.01	03.50	05.13 (1)	
	15.28	16.52	18.12	6 08.43 (4)	20.35	49 08.53 (3)	21.58	23.12	22 05.35 (1)	
9	09.47	08.37	07.12	06.31	06.31	07.36 (2)	04.58	03.48	05.13 (1)	
	15.30	16.55	18.15	20.38	45 08.52 (3)	22.00	23.14	22 05.35 (1)		
10	09.46	08.35	07.08	06.28	06.28	07.38 (2)	04.55	03.47	05.13 (1)	
	15.33	16.58	18.17	20.40	38 08.51 (3)	22.03	23.16	22 05.35 (1)		
11	09.44	08.32	07.05	06.24	06.24	08.22 (3)	04.52	03.46	05.14 (1)	
	15.35	17.01	18.20	20.43	27 08.49 (3)	22.06	23.17	22 05.36 (1)		
12	09.43	08.29	07.02	06.21	06.21	08.24 (3)	04.49	03.45	05.13 (1)	
	15.37	17.04	18.23	20.46	23 08.47 (3)	22.09	23.18	23 05.36 (1)		
13	09.41	08.26	06.59	06.18	06.18	08.25 (3)	04.46	03.44	05.14 (1)	
	15.40	17.07	18.25	20.49	20 08.45 (3)	22.12	23.19	22 05.36 (1)		
14	09.39	08.23	06.56	06.15	06.15	08.27 (3)	04.44	03.44	05.14 (1)	
	15.42	17.10	18.28	20.51	14 08.41 (3)	22.14	23.21	22 05.36 (1)		
15	09.38	08.20	06.52	06.12	06.12	04.41	03.43	05.14 (1)		
	15.45	17.13	18.31	20.54	22.17	23.22	23 05.37 (1)			
16	09.36	08.17	06.49	06.08	06.08	04.38	03.42	05.15 (1)		
	15.47	17.16	18.33	20.57	22.20	23.22	22 05.37 (1)			
17	09.34	08.14	06.46	06.05	06.05	04.36	03.42	05.14 (1)		
	15.50	17.19	18.36	21.00	22.22	23.23	22 05.36 (1)			
18	09.32	08.11	06.43	06.02	06.02	04.33	03.42	05.15 (1)		
	15.52	17.21	18.39	21.02	22.25	23.24	22 05.37 (1)			
19	09.30	08.08	06.39	05.59	05.59	04.30	03.41	05.15 (1)		
	15.55	17.24	18.42	21.05	22.28	23.24	22 05.37 (1)			
20	09.28	08.05	06.36	05.56	05.56	04.28	03.41	05.15 (1)		
	15.58	17.27	18.44	21.08	22.30	23.25	22 05.37 (1)			
21	09.26	08.02	06.33	05.52	05.52	04.25	03.41	05.16 (1)		
	16.01	17.30	18.47	21.10	22.33	23.25	22 05.38 (1)			
22	09.24	07.59	06.30	05.49	05.49	04.23	03.41	05.16 (1)		
	16.03	17.33	18.50	21.13	22.35	23.25	22 05.38 (1)			
23	09.21	07.56	08.42 (4)	06.26	07.36 (3)	05.46	04.20	05.20 (1)	03.42	05.16 (1)
	16.06	17.36	1 08.43 (4)	18.52	13 07.49 (3)	21.16	22.38	5 05.25 (1)	23.25	22 05.38 (1)
24	09.19	07.53	08.37 (4)	06.23	07.33 (3)	05.43	04.18	05.18 (1)	03.42	05.16 (1)
	16.09	17.38	11 08.48 (4)	18.55	19 07.52 (3)	21.19	22.41	9 05.27 (1)	23.25	22 05.38 (1)
25	09.17	07.50	08.36 (4)	06.20	07.29 (3)	05.40	04.16	05.16 (1)	03.43	05.16 (1)
	16.12	17.41	14 08.50 (4)	18.58	24 07.53 (3)	21.22	22.43	12 05.28 (1)	23.25	22 05.38 (1)
26	09.14	07.47	08.35 (4)	06.17	07.28 (3)	05.37	04.13	05.15 (1)	03.43	05.17 (1)
	16.15	17.44	16 08.51 (4)	19.00	27 07.55 (3)	21.24	22.45	14 05.29 (1)	23.25	22 05.39 (1)
27	09.12	07.43	08.33 (4)	06.13	07.26 (3)	05.34	04.11	05.14 (1)	03.44	05.17 (1)
	16.17	17.47	18 08.51 (4)	19.03	30 07.56 (3)	21.27	22.48	16 05.30 (1)	23.25	22 05.39 (1)
28	09.10	07.40	08.32 (4)	06.10	07.24 (3)	05.31	04.09	05.14 (1)	03.45	05.17 (1)
	16.20	17.50	20 08.52 (4)	19.06	32 07.56 (3)	21.30	22.50	17 05.31 (1)	23.24	22 05.39 (1)
29	09.07		07.07	08.23 (3)	05.28	04.07	05.13 (1)	03.46	05.17 (1)	
	16.23		20.08	34 08.57 (3)	21.33	22.53	18 05.31 (1)	23.24	23 05.40 (1)	
30	09.05		07.03	07.42 (2)	05.24	04.05	05.13 (1)	03.47	05.18 (1)	
	16.26		20.11	44 08.57 (3)	21.35	22.55	19 05.32 (1)	23.23	22 05.40 (1)	
31	09.02		07.00	07.39 (2)		04.03	05.12 (1)			
	16.29		20.14	50 08.58 (3)		22.57	20 05.32 (1)			
Potential sun hours	194	247	364	443	547	586				
Total, worst case			80	406	597	658				
Sun reduction			0,32	0,36	0,45	0,47				
Oper. time red.			0,88	0,88	0,88	0,88				
Wind dir. red.			0,63	0,61	0,60	0,63				
Total reduction			0,18	0,19	0,24	0,26				
Total, real			14	78	142	171				

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December			
1	03.48	05.18 (1)	04.55	06.18	08.21 (3)	07.36	08.00	09.22	
	23.22	22 05.40 (1)	22.19	20.44	27 08.48 (3)	19.06	16.29	15.18	
2	03.49	05.18 (1)	04.58	06.21	07.36 (2)	07.39	08.03	09.25	
	23.21	22 05.40 (1)	22.16	20.40	39 08.49 (3)	19.02	16.26	15.16	
3	03.50	05.18 (1)	05.01	06.24	07.34 (2)	07.41	08.06	09.27	
	23.20	22 05.40 (1)	22.13	20.37	45 08.50 (3)	18.59	16.23	15.15	
4	03.52	05.18 (1)	05.03	06.26	07.32 (2)	07.44	08.09	09.29	
	23.19	22 05.40 (1)	22.10	20.34	49 08.50 (3)	18.56	16.21	15.13	
5	03.53	05.18 (1)	05.06	06.29	07.32 (2)	07.46	08.12	09.31	
	23.18	22 05.40 (1)	22.07	20.31	51 08.51 (3)	18.53	16.18	15.12	
6	03.55	05.18 (1)	05.09	06.31	07.30 (2)	07.49	09.12 (4)	08.15	09.33
	23.16	22 05.40 (1)	22.04	20.27	55 08.51 (3)	18.50	9 09.21 (4)	16.15	15.11
7	03.57	05.19 (1)	05.11	06.34	07.30 (2)	07.52	09.10 (4)	08.17	09.35
	23.15	22 05.41 (1)	22.02	20.24	55 08.51 (3)	18.46	13 09.23 (4)	16.12	15.10
8	03.58	05.19 (1)	05.14	06.37	07.29 (2)	07.54	09.08 (4)	08.20	09.37
	23.13	22 05.41 (1)	21.59	20.21	56 08.51 (3)	18.43	17 09.25 (4)	16.10	15.09
9	04.00	05.20 (1)	05.17	06.39	07.30 (2)	07.57	09.07 (4)	08.23	09.39
	23.12	21 05.41 (1)	21.56	20.18	55 08.51 (3)	18.40	19 09.26 (4)	16.07	15.08
10	04.02	05.20 (1)	05.20	06.42	07.29 (2)	08.00	09.07 (4)	08.26	09.41
	23.10	20 05.40 (1)	21.53	20.14	55 08.50 (3)	18.37	19 09.26 (4)	16.04	15.07
11	04.04	05.20 (1)	05.22	06.44	07.30 (2)	08.02	09.05 (4)	08.29	09.43
	23.08	21 05.41 (1)	21.50	20.11	52 08.50 (3)	18.34	20 09.25 (4)	16.02	15.06
12	04.06	05.21 (1)	05.25	06.47	07.31 (2)	08.05	09.05 (4)	08.32	09.44
	23.07	20 05.41 (1)	21.47	20.08	49 08.49 (3)	18.30	20 09.25 (4)	15.59	15.05
13	04.08	05.21 (1)	05.28	06.50	07.33 (2)	08.08	09.05 (4)	08.34	09.46
	23.05	19 05.40 (1)	21.44	20.05	44 08.49 (3)	18.27	20 09.25 (4)	15.56	15.05
14	04.10	05.22 (1)	05.30	06.52	08.13 (3)	08.10	09.05 (4)	08.37	09.47
	23.03	18 05.40 (1)	21.41	20.01	34 08.47 (3)	18.24	20 09.25 (4)	15.54	15.04
15	04.13	05.22 (1)	05.33	06.55	08.14 (3)	08.13	09.06 (4)	08.40	09.49
	23.01	18 05.40 (1)	21.37	19.58	32 08.46 (3)	18.21	18 09.24 (4)	15.51	15.04
16	04.15	05.23 (1)	05.36	06.57	08.14 (3)	08.16	09.07 (4)	08.43	09.50
	22.59	17 05.40 (1)	21.34	19.55	31 08.45 (3)	18.18	16 09.23 (4)	15.49	15.04
17	04.17	05.24 (1)	05.39	07.00	08.16 (3)	08.19	09.08 (4)	08.46	09.51
	22.57	15 05.39 (1)	21.31	19.51	28 08.44 (3)	18.15	13 09.21 (4)	15.46	15.04
18	04.19	05.24 (1)	05.41	07.02	08.17 (3)	08.21	09.10 (4)	08.49	09.52
	22.54	14 05.38 (1)	21.28	19.48	24 08.41 (3)	18.11	9 09.19 (4)	15.44	15.04
19	04.22	05.26 (1)	05.44	07.05	08.19 (3)	08.24		08.51	09.53
	22.52	11 05.37 (1)	21.25	19.45	20 08.39 (3)	18.08		15.42	15.04
20	04.24	05.28 (1)	05.47	07.08	08.21 (3)	08.27		08.54	09.54
	22.50	7 05.35 (1)	21.22	19.42	15 08.36 (3)	18.05		15.39	15.04
21	04.27		05.49	07.10	08.26 (3)	08.29		08.57	09.54
	22.47		21.19	19.38	4 08.30 (3)	18.02		15.37	15.04
22	04.29		05.52	07.13		08.32		08.59	09.55
	22.45		21.16	19.35		17.59		15.35	15.05
23	04.32		05.55	07.15		08.35		09.02	09.55
	22.43		21.12	19.32		17.56		15.33	15.05
24	04.34		05.57	07.18		08.38		09.05	09.56
	22.40		21.09	19.29		17.53		15.31	15.06
25	04.37		06.00	07.20		07.41		09.07	09.56
	22.38		21.06	19.25		16.50		15.29	15.07
26	04.39		06.03	07.23		07.43		09.10	09.56
	22.35		21.03	19.22		16.47		15.27	15.07
27	04.42		06.05	07.26		07.46		09.13	09.56
	22.32		21.00	19.19		16.44		15.25	15.08
28	04.45		06.08	08.34 (3)	07.28	07.49		09.15	09.56
	22.30		20.56	3 08.37 (3)	19.15	16.41		15.23	15.10
29	04.47		06.11	08.29 (3)	07.31	07.52		09.18	09.56
	22.27		20.53	14 08.43 (3)	19.12	16.38		15.21	15.11
30	04.50		06.13	08.25 (3)	07.33	07.55		09.20	09.56
	22.24		20.50	20 08.45 (3)	19.09	16.35		15.20	15.12
31	04.53		06.16	08.23 (3)		07.57			09.55
	22.22		20.47	23 08.46 (3)		16.32			15.13
Potential sun hours	578		495	390		311		215	166
Total, worst case	377		60	820		213			
Sun reduction	0,48		0,43	0,36		0,25			
Oper. time red.	0,88		0,88	0,88		0,88			
Wind dir. red.	0,63		0,60	0,60		0,63			
Total reduction	0,27		0,22	0,19		0,14			
Total, real	100		13	156		30			

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	10.19 (3)	07.37	06.57	08.10 (1)
	15.15	16.32	22 10.41 (3)	17.52	20.16	25 08.35 (1)
2	09.54	08.57	10.20 (3)	07.34	06.54	08.09 (1)
	15.17	16.35	21 10.41 (3)	17.55	20.19	24 08.33 (1)
3	09.53	08.54	10.19 (3)	07.31	06.50	08.10 (1)
	15.19	16.38	21 10.40 (3)	17.58	20.22	22 08.32 (1)
4	09.53	08.51	10.20 (3)	07.28	06.47	08.11 (1)
	15.20	16.41	20 10.40 (3)	18.01	20.24	20 08.31 (1)
5	09.52	08.49	10.20 (3)	07.25	06.44	08.12 (1)
	15.22	16.43	20 10.40 (3)	18.04	20.27	17 08.29 (1)
6	09.51	08.46	10.21 (3)	07.21	06.41	08.13 (1)
	15.24	16.46	19 10.40 (3)	18.06	20.30	13 08.26 (1)
7	09.50	08.43	10.23 (3)	07.18	06.37	08.16 (1)
	15.26	16.49	16 10.39 (3)	18.09	20.32	6 08.22 (1)
8	09.48	08.40	10.23 (3)	07.15	06.34	05.01
	15.28	16.52	14 10.37 (3)	18.12	20.35	21.58
9	09.47	08.38	10.25 (3)	07.12	06.31	04.58
	15.30	16.55	10 10.35 (3)	18.15	20.38	22.01
10	09.46	08.35	07.08	06.28	04.55	03.47
	15.33	16.58	18.17	20.41	22.03	23.16
11	09.44	08.32	07.05	06.24	04.52	03.46
	15.35	17.01	18.20	20.43	22.06	23.17
12	09.43	08.29	07.02	06.21	04.49	03.45
	15.37	17.04	18.23	20.46	22.09	23.18
13	09.41	08.26	06.59	06.18	04.46	03.44
	15.40	17.07	18.25	20.49	22.12	23.20
14	09.39	08.23	06.56	06.15	04.44	03.43
	15.42	17.10	18.28	20.51	22.14	23.21
15	09.38	08.20	06.52	06.12	04.41	03.43
	15.45	17.13	18.31	20.54	22.17	23.22
16	09.36	08.17	06.49	06.08	04.38	03.42
	15.47	17.16	18.33	20.57	22.20	23.23
17	09.34	08.14	06.46	06.05	04.35	03.42
	15.50	17.18	18.36	21.00	22.22	23.23
18	09.32	08.11	06.43	06.02	04.33	03.41
	15.52	17.21	18.39	21.02	22.25	23.24
19	09.30	08.08	06.39	05.59	04.30	03.41
	15.55	17.24	18.42	21.05	22.28	23.25
20	09.28	08.05	06.36	05.56	04.28	03.41
	15.58	17.27	18.44	21.08	22.30	23.25
21	09.26	08.02	06.33	05.52	04.25	03.41
	16.00	17.30	18.47	21.11	22.33	23.25
22	09.24	07.59	06.30	05.49	04.23	03.41
	16.03	17.33	18.50	6 07.22 (1) 21.13	22.36	23.26
23	09.21	10.26 (3) 07.56	06.26	07.18 (1) 05.46	04.20	03.41
	16.06	4 10.30 (3) 17.36	18.52	14 07.32 (1) 21.16	22.38	23.26
24	09.19	10.23 (3) 07.53	06.23	07.16 (1) 05.43	04.18	03.42
	16.09	10 10.33 (3) 17.38	18.55	18 07.34 (1) 21.19	22.41	23.26
25	09.17	10.21 (3) 07.50	06.20	07.13 (1) 05.40	04.16	03.42
	16.12	14 10.35 (3) 17.41	18.58	21 07.34 (1) 21.22	22.43	23.25
26	09.14	10.20 (3) 07.47	06.16	07.12 (1) 05.37	04.13	03.43
	16.14	16 10.36 (3) 17.44	19.00	23 07.35 (1) 21.24	22.46	23.25
27	09.12	10.20 (3) 07.43	06.13	07.11 (1) 05.34	04.11	03.44
	16.17	17 10.37 (3) 17.47	19.03	24 07.35 (1) 21.27	22.48	23.25
28	09.10	10.19 (3) 07.40	06.10	07.10 (1) 05.31	04.09	03.44
	16.20	19 10.38 (3) 17.50	19.06	25 07.35 (1) 21.30	22.50	23.24
29	09.07	10.19 (3) 07.36	07.07	08.10 (1) 05.27	04.07	03.45
	16.23	20 10.39 (3) 17.43	19.09	25 08.35 (1) 21.33	22.53	23.24
30	09.05	10.19 (3) 07.33	07.03	08.09 (1) 05.24	04.05	03.46
	16.26	21 10.40 (3) 17.40	20.11	26 08.35 (1) 21.35	22.55	23.23
31	09.02	10.19 (3) 07.30	07.00	08.09 (1) 05.21	04.03	03.46
	16.29	21 10.40 (3) 17.37	20.14	26 08.35 (1) 21.32	22.57	23.23
Potential sun hours	194	247	364	443	547	586
Total, worst case	142	163	208	127		
Sun reduction	0,16	0,32	0,36	0,45		
Oper. time red.	0,88	0,88	0,88	0,88		
Wind dir. red.	0,66	0,66	0,60	0,60		
Total reduction	0,09	0,19	0,19	0,24		
Total, real	13	31	41	31		

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.58 (3) 09.22
	23.22	22.19	20.44	19.06	16.29	3 10.01 (3) 15.18
2	03.49	04.58	06.21	07.39	08.03	09.54 (3) 09.25
	23.21	22.16	20.40	19.02	16.26	11 10.05 (3) 15.16
3	03.50	05.01	06.24	07.41	08.06	09.53 (3) 09.27
	23.20	22.13	20.37	18.59	16.23	15 10.08 (3) 15.15
4	03.52	05.03	06.26	07.44	08.09	09.52 (3) 09.29
	23.19	22.10	20.34	18.56	16.21	17 10.09 (3) 15.13
5	03.53	05.06	06.29	08.14 (1) 07.47	08.12	09.51 (3) 09.31
	23.18	22.07	20.31	4 08.18 (1) 18.53	16.18	18 10.09 (3) 15.12
6	03.55	05.09	06.31	08.09 (1) 07.49	08.15	09.51 (3) 09.34
	23.17	22.05	20.27	13 08.22 (1) 18.50	16.15	20 10.11 (3) 15.11
7	03.56	05.11	06.34	08.07 (1) 07.52	08.17	09.50 (3) 09.36
	23.15	22.02	20.24	17 08.24 (1) 18.46	16.12	21 10.11 (3) 15.10
8	03.58	05.14	06.37	08.05 (1) 07.54	08.20	09.50 (3) 09.37
	23.14	21.59	20.21	20 08.25 (1) 18.43	16.09	21 10.11 (3) 15.09
9	04.00	05.17	06.39	08.04 (1) 07.57	08.23	09.50 (3) 09.39
	23.12	21.56	20.18	22 08.26 (1) 18.40	16.07	22 10.12 (3) 15.08
10	04.02	05.19	06.42	08.03 (1) 08.00	08.26	09.50 (3) 09.41
	23.10	21.53	20.14	23 08.26 (1) 18.37	16.04	21 10.11 (3) 15.07
11	04.04	05.22	06.44	08.02 (1) 08.02	08.29	09.50 (3) 09.43
	23.09	21.50	20.11	25 08.27 (1) 18.34	16.01	21 10.11 (3) 15.06
12	04.06	05.25	06.47	08.01 (1) 08.05	08.32	09.51 (3) 09.44
	23.07	21.47	20.08	25 08.26 (1) 18.30	15.59	20 10.11 (3) 15.05
13	04.08	05.28	06.50	08.01 (1) 08.08	08.35	09.51 (3) 09.46
	23.05	21.44	20.05	26 08.27 (1) 18.27	15.56	20 10.11 (3) 15.05
14	04.10	05.30	06.52	08.00 (1) 08.10	08.37	09.52 (3) 09.47
	23.03	21.41	20.01	26 08.26 (1) 18.24	15.54	19 10.11 (3) 15.04
15	04.12	05.33	06.55	08.00 (1) 08.13	08.40	09.53 (3) 09.49
	23.01	21.38	19.58	26 08.26 (1) 18.21	15.51	17 10.10 (3) 15.04
16	04.15	05.36	06.57	08.00 (1) 08.16	08.43	09.53 (3) 09.50
	22.59	21.34	19.55	24 08.24 (1) 18.18	15.49	16 10.09 (3) 15.04
17	04.17	05.38	07.00	08.01 (1) 08.19	08.46	09.55 (3) 09.51
	22.57	21.31	19.51	23 08.24 (1) 18.15	15.46	14 10.09 (3) 15.04
18	04.19	05.41	07.02	08.01 (1) 08.21	08.49	09.57 (3) 09.52
	22.54	21.28	19.48	21 08.22 (1) 18.11	15.44	10 10.07 (3) 15.04
19	04.22	05.44	07.05	08.02 (1) 08.24	08.51	10.01 (3) 09.53
	22.52	21.25	19.45	19 08.21 (1) 18.08	15.42	4 10.05 (3) 15.04
20	04.24	05.47	07.08	08.03 (1) 08.27	08.54	09.54
	22.50	21.22	19.42	15 08.18 (1) 18.05	15.39	15.04
21	04.27	05.49	07.10	08.06 (1) 08.30	08.57	09.54
	22.48	21.19	19.38	9 08.15 (1) 18.02	15.37	15.04
22	04.29	05.52	07.13	08.32	09.00	09.55
	22.45	21.16	19.35	17.59	15.35	15.05
23	04.32	05.55	07.15	08.35	09.02	09.56
	22.43	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57	07.18	08.38	09.05	09.56
	22.40	21.09	19.29	17.53	15.31	15.06
25	04.37	06.00	07.20	07.41	09.08	09.56
	22.38	21.06	19.25	16.50	15.29	15.06
26	04.39	06.03	07.23	07.43	09.10	09.56
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05	07.26	07.46	09.13	09.56
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.44	06.08	07.28	07.49	09.15	09.56
	22.30	20.57	19.15	16.41	15.23	15.09
29	04.47	06.10	07.31	07.52	09.18	09.56
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13	07.33	07.55	09.20	09.56
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16	07.37	07.57	09.23	09.55
	22.22	20.47	19.06	16.32	15.17	15.13
Potential sun hours	579	495	390	311	215	166
Total, worst case			338		310	
Sun reduction			0,36		0,16	
Oper. time red.			0,88		0,88	
Wind dir. red.			0,60		0,66	
Total reduction			0,19		0,10	
Total, real			66		30	

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** I - Asuinrakennus I, ~Kankaanpääntie 218
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December			
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.18 (1)	09.23		
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	22	09.40 (1)	15.18	
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.19 (1)	09.25		
	15.17	16.35	17.55	20.19	21.41	23.02	23.21	22.16	20.40	19.02	16.26	20	09.39 (1)	15.16	
3	09.54	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.21 (1)	09.27		
	15.18	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	17	09.38 (1)	15.15	
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.23 (1)	09.29		
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	13	09.36 (1)	15.13	
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.26 (1)	09.31		
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	7	09.33 (1)	15.12	
6	09.51	08.46	09.56 (1)	07.21	06.41	05.06	03.52	05.09	06.31	07.49	08.15		09.34		
	15.24	16.46	8	10.04 (1)	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.49	16.15	15.11	
7	09.50	08.43	09.53 (1)	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36		
	15.26	16.49	14	10.07 (1)	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09	
8	09.48	08.40	09.52 (1)	07.15	06.34	05.00	03.49	03.58	05.14	06.37	07.54	08.20	09.38		
	15.28	16.52	17	10.09 (1)	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08	
9	09.47	08.38	09.50 (1)	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39		
	15.30	16.55	20	10.10 (1)	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.07	
10	09.46	08.35	09.49 (1)	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41		
	15.32	16.58	22	10.11 (1)	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07	
11	09.44	08.32	09.48 (1)	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43		
	15.35	17.01	24	10.12 (1)	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06	
12	09.43	08.29	09.48 (1)	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44		
	15.37	17.04	25	10.13 (1)	18.23	20.46	22.09	23.19	23.07	21.47	20.08	18.30	15.59	15.05	
13	09.41	08.26	09.47 (1)	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.35	09.46		
	15.40	17.07	26	10.13 (1)	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05	
14	09.39	08.23	09.47 (1)	06.56	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47		
	15.42	17.10	26	10.13 (1)	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04	
15	09.38	08.20	09.47 (1)	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49		
	15.44	17.13	27	10.14 (1)	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04	
16	09.36	08.17	09.47 (1)	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50		
	15.47	17.16	27	10.14 (1)	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04	
17	09.34	08.14	09.47 (1)	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51		
	15.50	17.18	26	10.13 (1)	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03	
18	09.32	08.11	09.47 (1)	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	10.26 (1)	08.49	09.52	
	15.52	17.21	26	10.13 (1)	18.39	21.02	22.25	23.24	22.55	21.28	19.48	18.11	10	10.36 (1)	15.44
19	09.30	08.08	09.48 (1)	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	10.23 (1)	08.51	09.53	
	15.55	17.24	25	10.13 (1)	18.42	21.05	22.28	23.25	21.25	19.45	18.08	16	10.39 (1)	15.41	15.03
20	09.28	08.05	09.48 (1)	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	10.21 (1)	08.54	09.54	
	15.58	17.27	23	10.11 (1)	18.44	21.08	22.30	23.25	21.22	19.42	18.05	19	10.40 (1)	15.39	15.04
21	09.26	08.02	09.49 (1)	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	10.20 (1)	08.57	09.55	
	16.00	17.30	21	10.10 (1)	18.47	21.11	22.33	23.25	21.19	19.38	18.02	22	10.42 (1)	15.37	15.04
22	09.24	07.59	09.51 (1)	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	10.19 (1)	09.00	09.55	
	16.03	17.33	18	10.09 (1)	18.50	21.13	22.36	23.26	22.45	21.16	19.35	23	10.42 (1)	15.35	15.04
23	09.21	07.56	09.52 (1)	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	10.18 (1)	09.02	09.56	
	16.06	17.36	14	10.06 (1)	18.52	21.16	22.38	23.26	22.43	21.12	19.32	25	10.43 (1)	15.33	15.05
24	09.19	07.53	09.55 (1)	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	10.17 (1)	09.05	09.56	
	16.09	17.38	8	10.03 (1)	18.55	21.19	22.41	23.26	22.40	21.09	19.28	26	10.43 (1)	15.31	15.06
25	09.17	07.50		06.20	05.40	04.15	03.42	04.37	06.00	07.20	07.41	09.17 (1)	09.08	09.56	
	16.12	17.41		18.58	21.22	22.43	23.26	22.38	21.06	19.25	16.50	26	09.43 (1)	15.28	15.06
26	09.14	07.47		06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.16 (1)	09.10	09.56	
	16.14	17.44		19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	27	09.43 (1)	15.27	15.07
27	09.12	07.43		06.13	05.34	04.11	03.43	04.42	06.05	07.26	07.46	09.16 (1)	09.13	09.56	
	16.17	17.47		19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	27	09.43 (1)	15.25	15.08
28	09.10	07.40		06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.16 (1)	09.15	09.56	
	16.20	17.50		19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	26	09.42 (1)	15.23	15.09
29	09.07			07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.16 (1)	09.18	09.56	
	16.23			20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	26	09.42 (1)	15.21	15.10
30	09.05			07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.17 (1)	09.20	09.56	
	16.26			20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	25	09.42 (1)	15.19	15.12
31	09.02			07.00	04.03	03.47	03.47	04.52	06.16	07.37	07.57	09.18 (1)	09.20	09.56	
	16.29			20.14	22.57	23.28	23.22	22.22	20.47	16.32	23	09.41 (1)	15.13	15.13	
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	79	166		
Total, worst case		397								321		79			
Sun reduction		0,32								0,25		0,16			
Oper. time red.		0,88								0,88		0,88			
Wind dir. red.		0,64								0,64		0,64			
Total reduction		0,18								0,14		0,09			
Total, real		71								45		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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	January		February		March		April		May		June	
1	09.55	12.15 (2)	08.59	14.24 (1)	07.37	09.34 (5)	06.57	05.21	04.01			
	15.15	18	12.33 (2)	16.32	13	14.37 (1)	17.52	32	10.06 (5)	20.16	21.38	22.59
2	09.54	12.16 (2)	08.57	14.21 (1)	07.34	09.34 (5)	06.53	05.18	03.59			
	15.17	18	12.34 (2)	16.35	19	14.40 (1)	17.55	30	10.04 (5)	20.19	21.41	23.01
3	09.53	12.15 (2)	08.54	14.19 (1)	07.31	09.35 (5)	06.50	05.15	03.57			
	15.18	19	12.34 (2)	16.37	23	14.42 (1)	17.58	29	10.04 (5)	20.22	21.44	23.03
4	09.53	12.15 (2)	08.51	14.18 (1)	07.28	09.36 (5)	06.47	05.12	03.55			
	15.20	20	12.35 (2)	16.40	25	14.43 (1)	18.01	26	10.02 (5)	20.24	21.47	23.05
5	09.52	12.17 (2)	08.49	14.17 (1)	07.24	07.55 (15)	06.44	05.09	03.54			
	15.22	19	12.36 (2)	16.43	28	14.45 (1)	18.03	32	10.00 (5)	20.27	21.49	23.07
6	09.51	12.17 (2)	08.46	14.16 (1)	07.21	07.52 (15)	06.40	05.06	03.52			
	15.24	20	12.37 (2)	16.46	30	14.46 (1)	18.06	33	09.58 (5)	20.30	21.52	23.09
7	09.50	12.16 (2)	08.43	14.15 (1)	07.18	07.51 (15)	06.37	05.03	03.51			
	15.26	20	12.36 (2)	16.49	33	14.48 (1)	18.09	29	09.54 (5)	20.32	21.55	23.11
8	09.48	12.17 (2)	08.40	14.14 (1)	07.15	07.49 (15)	06.34	05.00	03.49			
	15.28	20	12.37 (2)	16.52	34	14.48 (1)	18.12	19	08.08 (15)	20.35	21.58	23.13
9	09.47	12.17 (2)	08.37	14.14 (1)	07.12	07.48 (15)	06.31	04.57	03.48			
	15.30	21	12.38 (2)	16.55	35	14.49 (1)	18.14	21	08.09 (15)	20.38	22.00	23.14
10	09.46	12.18 (2)	08.35	14.13 (1)	07.08	07.48 (15)	06.27	04.55	03.47			
	15.32	20	12.38 (2)	16.58	37	14.50 (1)	18.17	21	08.09 (15)	20.40	22.03	23.16
11	09.44	12.18 (2)	08.32	14.13 (1)	07.05	07.47 (15)	06.24	04.52	03.46			
	15.35	20	12.38 (2)	17.01	37	14.50 (1)	18.20	21	08.08 (15)	20.43	22.06	23.17
12	09.43	12.19 (2)	08.29	14.12 (1)	07.02	07.47 (15)	06.21	04.49	03.45			
	15.37	20	12.39 (2)	17.04	38	14.50 (1)	18.23	21	08.08 (15)	20.46	22.09	23.18
13	09.41	12.19 (2)	08.26	09.48 (5)	06.59	07.47 (15)	06.18	04.46	03.44			
	15.39	20	12.39 (2)	17.07	44	14.50 (1)	18.25	21	08.08 (15)	20.49	22.12	23.20
14	09.39	12.20 (2)	08.23	09.44 (5)	06.55	07.47 (15)	06.15	04.43	03.43			
	15.42	20	12.40 (2)	17.10	54	14.51 (1)	18.28	20	08.07 (15)	20.51	22.14	23.21
15	09.38	12.20 (2)	08.20	09.42 (5)	06.52	07.48 (15)	06.11	04.41	03.42			
	15.44	20	12.40 (2)	17.13	57	14.51 (1)	18.31	18	08.06 (15)	20.54	22.17	23.22
16	09.36	12.21 (2)	08.17	09.39 (5)	06.49	07.49 (15)	06.08	04.38	03.42			
	15.47	18	12.39 (2)	17.15	61	14.50 (1)	18.33	15	08.04 (15)	20.57	22.20	23.23
17	09.34	12.22 (2)	08.14	09.38 (5)	06.46	07.50 (15)	06.05	04.35	03.41			
	15.50	18	12.40 (2)	17.18	64	14.50 (1)	18.36	11	08.01 (15)	20.59	22.22	23.23
18	09.32	12.23 (2)	08.11	09.37 (5)	06.42		06.02	04.33	03.41			
	15.52	17	12.40 (2)	17.21	65	14.50 (1)	18.39		21.02	22.25	23.24	
19	09.30	12.24 (2)	08.08	09.36 (5)	06.39		05.59	04.30	03.41			
	15.55	15	12.39 (2)	17.24	66	14.50 (1)	18.41		21.05	22.28	23.25	
20	09.28	12.25 (2)	08.05	09.35 (5)	06.36		05.55	04.27	03.41			
	15.58	13	12.38 (2)	17.27	67	14.49 (1)	18.44		21.08	22.30	23.25	
21	09.26	12.26 (2)	08.02	09.34 (5)	06.33		05.52	04.25	03.41			
	16.00	11	12.37 (2)	17.30	67	14.48 (1)	18.47		21.10	22.33	23.25	
22	09.24	12.28 (2)	07.59	09.34 (5)	06.29		05.49	04.23	03.41			
	16.03	8	12.36 (2)	17.33	65	14.47 (1)	18.49		21.13	22.36	23.26	
23	09.21		07.56	09.33 (5)	06.26		05.46	04.20	03.41			
	16.06		17.35	14.45 (1)	18.52		21.16	22.38	23.26			
24	09.19		07.53	09.33 (5)	06.23		05.43	04.18	03.42			
	16.09		17.38	14.44 (1)	18.55		21.19	22.41	23.26			
25	09.17		07.50	09.33 (5)	06.20		05.40	04.15	03.42			
	16.11		17.41	14.43 (1)	18.57		21.21	22.43	23.25			
26	09.14		07.46	09.32 (5)	06.16		05.37	04.13	03.43			
	16.14		17.44	14.39 (1)	19.00		21.24	22.46	23.25			
27	09.12		07.43	09.33 (5)	06.13		05.33	04.11	03.43			
	16.17		17.47	14.35 (1)	19.03		21.27	22.48	23.25			
28	09.10		07.40	09.33 (5)	06.10		05.30	04.09	03.44			
	16.20		17.50	10.07 (5)	19.05		21.30	22.50	23.24			
29	09.07				07.07		05.27	04.07	03.45			
	16.23				20.08		21.33	22.53	23.24			
30	09.04				07.03		05.24	04.04	03.46			
	16.26				20.11		21.35	22.55	23.23			
31	09.02	14.28 (1)			07.00			04.03				
	16.29	3	14.31 (1)		20.13			22.57				
Potential sun hours	194		247		364		443	547	586			
Total, worst case	398		1272		399							
Sun reduction	0,16		0,32		0,36							
Oper. time red.	0,88		0,88		0,88							
Wind dir. red.	0,68		0,65		0,61							
Total reduction	0,10		0,19		0,20							
Total, real	38		235		78							

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.47	04.55	06.18	07.36	08.26 (15)	08.00
	23.22	22.19	20.44	19.06	22 08.48 (15)	16.29
2	03.49	04.58	06.21	07.38	08.26 (15)	08.03
	23.21	22.16	20.40	19.02	22 08.48 (15)	16.26
3	03.50	05.00	06.23	07.41	08.25 (15)	08.06
	23.20	22.13	20.37	18.59	22 08.47 (15)	16.23
4	03.51	05.03	06.26	07.44	08.25 (15)	08.09
	23.19	22.10	20.34	18.56	21 08.46 (15)	16.20
5	03.53	05.06	06.29	07.46	08.26 (15)	08.12
	23.18	22.07	20.31	18.53	20 08.46 (15)	16.18
6	03.54	05.08	06.31	07.49	08.26 (15)	08.14
	23.16	22.04	20.27	18.49	25 10.27 (5)	16.15
7	03.56	05.11	06.34	07.52	08.27 (15)	08.17
	23.15	22.02	20.24	18.46	32 10.32 (5)	16.12
8	03.58	05.14	06.36	07.54	08.29 (15)	08.20
	23.14	21.59	20.21	18.43	33 10.34 (5)	16.09
9	04.00	05.17	06.39	07.57	08.32 (15)	08.23
	23.12	21.56	20.17	18.40	29 10.36 (5)	16.07
10	04.02	05.19	06.42	08.00	10.09 (5)	08.26
	23.10	21.53	20.14	18.37	28 10.37 (5)	16.04
11	04.04	05.22	06.44	08.02	10.08 (5)	08.29
	23.09	21.50	20.11	18.33	30 10.38 (5)	16.01
12	04.06	05.25	06.47	08.05	10.07 (5)	08.32
	23.07	21.47	20.08	18.30	31 10.38 (5)	15.59
13	04.08	05.27	06.49	08.08	10.07 (5)	08.34
	23.05	21.44	20.04	18.27	32 10.39 (5)	15.56
14	04.10	05.30	06.52	08.10	10.06 (5)	08.37
	23.03	21.40	20.01	18.24	33 10.39 (5)	15.54
15	04.12	05.33	06.55	08.13	10.06 (5)	08.40
	23.01	21.37	19.58	18.21	46 15.10 (1)	15.51
16	04.14	05.36	06.57	08.16	10.05 (5)	08.43
	22.59	21.34	19.55	18.18	54 15.13 (1)	15.49
17	04.17	05.38	07.00	08.18	10.05 (5)	08.46
	22.57	21.31	19.51	18.14	59 15.15 (1)	15.46
18	04.19	05.41	07.02	08.21	10.05 (5)	08.49
	22.54	21.28	19.48	18.11	62 15.17 (1)	15.44
19	04.21	05.44	07.05	08.24	10.05 (5)	08.51
	22.52	21.25	19.45	18.08	64 15.18 (1)	15.41
20	04.24	05.46	07.07	08.27	10.05 (5)	08.54
	22.50	21.22	19.41	18.05	67 15.19 (1)	15.39
21	04.26	05.49	07.10	08.29	10.05 (5)	08.57
	22.47	21.19	19.38	18.02	67 15.19 (1)	15.37
22	04.29	05.52	07.13	08.32	10.06 (5)	08.59
	22.45	21.16	19.35	17.59	67 15.20 (1)	15.35
23	04.31	05.54	07.15	08.35	10.06 (5)	09.02
	22.43	21.12	19.32	17.56	66 15.20 (1)	15.33
24	04.34	05.57	07.18	08.38	10.07 (5)	09.05
	22.40	21.09	19.28	17.53	65 15.20 (1)	15.30
25	04.36	06.00	07.20	07.40	09.08 (5)	09.07
	22.38	21.06	19.25	16.50	64 14.20 (1)	15.28
26	04.39	06.02	07.23	08.34 (15)	07.43	09.10 (5)
	22.35	21.03	19.22	9 08.43 (15)	16.47	60 14.20 (1)
27	04.42	06.05	07.25	08.31 (15)	07.46	09.11 (5)
	22.32	21.00	19.19	14 08.45 (15)	16.44	57 14.20 (1)
28	04.44	06.08	07.28	08.29 (15)	07.49	09.14 (5)
	22.30	20.56	19.15	17 08.46 (15)	16.41	51 14.20 (1)
29	04.47	06.10	07.31	08.29 (15)	07.52	09.19 (5)
	22.27	20.53	19.12	18 08.47 (15)	16.38	41 14.20 (1)
30	04.50	06.13	07.33	08.27 (15)	07.55	13.43 (1)
	22.24	20.50	19.09	20 08.47 (15)	16.35	37 14.20 (1)
31	04.52	06.16		07.57	13.43 (1)	
	22.22	20.47		16.32	37 14.20 (1)	
Potential sun hours	579	495	390	311	215	166
Total, worst case			78	1344	456	536
Sun reduction			0,36	0,25	0,16	0,11
Oper. time red.			0,88	0,88	0,88	0,88
Wind dir. red.			0,60	0,64	0,67	0,68
Total reduction			0,19	0,14	0,10	0,07
Total, real			15	192	44	35

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: Paholammi_VE1_Shadow_No_Forest_20211129 **Shadow receptor:** K - Asuinrakennus K, ~Seppäkoskentie 36
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

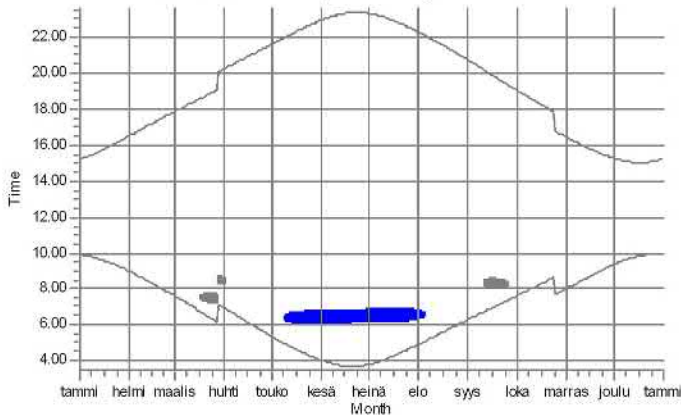
	January	February	March	April	May	June	July	August	September	October	November	December	
1 09.55	08.59	14.18 (1)	07.37	06.57	05.21	04.00	03.47	04.55	06.18	07.36	08.00	09.22	11.08 (5)
2 09.54	08.57	14.22 (1)	07.34	06.53	05.18	03.59	03.48	04.58	06.21	07.38	08.03	09.25	11.09 (5)
3 09.53	08.54	14.26 (1)	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27	11.11 (5)
4 09.53	08.51		07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29	11.12 (5)
5 09.52	11.32 (5)	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31	11.14 (5)
6 09.51	11.30 (5)	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.34	11.14 (5)
7 09.50	11.29 (5)	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36	11.18 (5)
8 09.48	11.27 (5)	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37	11.21 (5)
9 09.47	11.25 (5)	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39	11.25 (5)
10 09.46	11.23 (5)	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41	11.25 (5)
11 09.44	11.21 (5)	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43	11.25 (5)
12 09.43	11.19 (5)	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44	11.25 (5)
13 09.41	11.17 (5)	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.45	11.25 (5)
14 09.39	11.15 (5)	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46	11.25 (5)
15 09.38	11.13 (5)	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.47	11.25 (5)
16 09.36	11.11 (5)	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.48	11.25 (5)
17 09.34	11.09 (5)	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.49	11.25 (5)
18 09.32	11.07 (5)	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.50	11.25 (5)
19 09.30	11.05 (5)	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.51	11.25 (5)
20 09.28	11.03 (5)	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.52	11.25 (5)
21 09.26	11.01 (5)	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.53	11.25 (5)
22 09.24	10.59 (5)	07.99	06.29	05.49	04.22	03.41	04.29	05.52	07.13	08.32	09.00	09.54	11.25 (5)
23 09.21	10.57 (5)	07.96	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55	11.25 (5)
24 09.19	10.55 (5)	07.93	06.23	05.43	04.18	03.41	04.34	05.57	07.18	08.38	09.05	09.56	11.25 (5)
25 09.17	10.53 (5)	07.90	06.20	05.40	04.15	03.42	04.36	06.00	07.20	08.40	09.07	09.56	11.25 (5)
26 09.14	10.51 (5)	07.87	06.16	05.36	04.13	03.43	04.39	06.02	07.23	08.43	09.10	09.56	11.25 (5)
27 09.12	10.49 (5)	07.84	06.13	05.33	04.11	03.43	04.42	06.03	07.25	08.46	09.13	09.56	11.25 (5)
28 09.10	10.47 (5)	07.81	06.10	05.30	04.09	03.44	04.44	06.08	07.28	08.49	09.15	09.56	11.25 (5)
29 09.07	10.45 (5)	07.78	06.07	05.27	04.06	03.45	04.47	06.10	07.31	08.52	09.18	09.56	11.25 (5)
30 09.05	10.43 (5)	07.75	06.03	05.24	04.04	03.46	04.49	06.13	07.33	08.55	09.20	09.56	11.25 (5)
31 09.02	10.41 (5)	07.72	06.00	05.21	04.02	03.47	04.52	06.16	07.35	08.57	09.22	09.56	11.25 (5)
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166	82
Total, worst case	823	15									758		82
Sun reduction	0,16	0,32									0,16		0,11
Oper. time red.	0,88	0,88									0,88		0,88
Wind dir. red.	0,66	0,66									0,66		0,66
Total reduction	0,09	0,19									0,10		0,06
Total, real	77	3									72		5

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

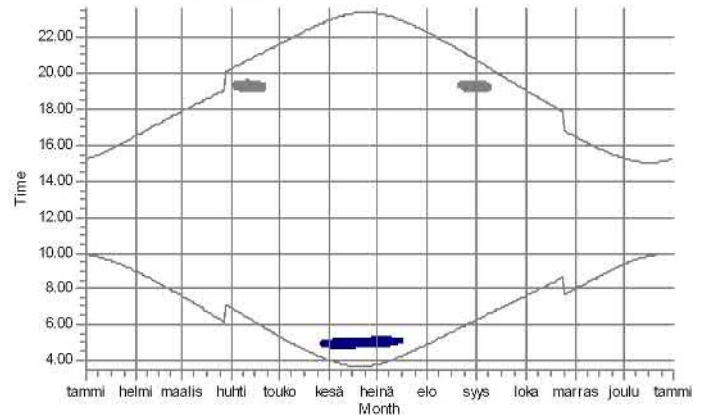
Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar, graphical**Calculation:** Paholammi_VE1_Shadow_No_Forest_20211129

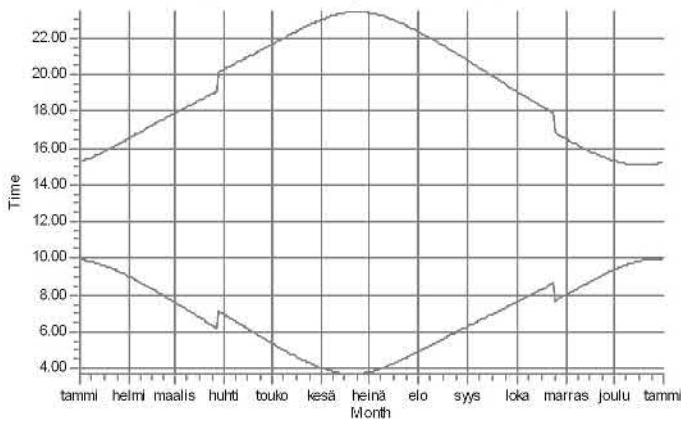
A: Asuinrakennus A, ~Kankaanpääntie 534



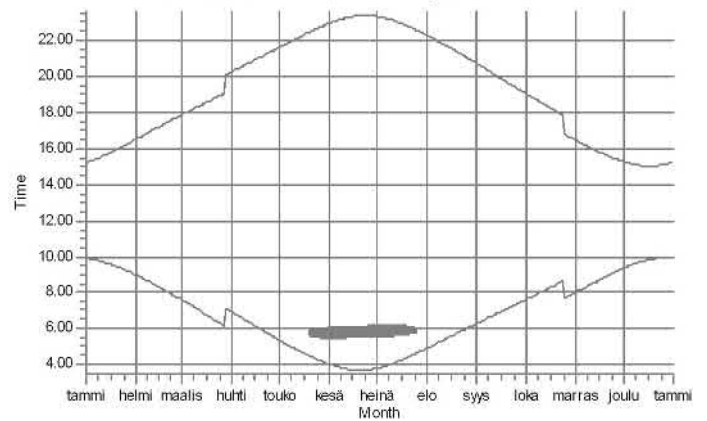
B: Asuinrakennus B, ~Ristiläntie 459



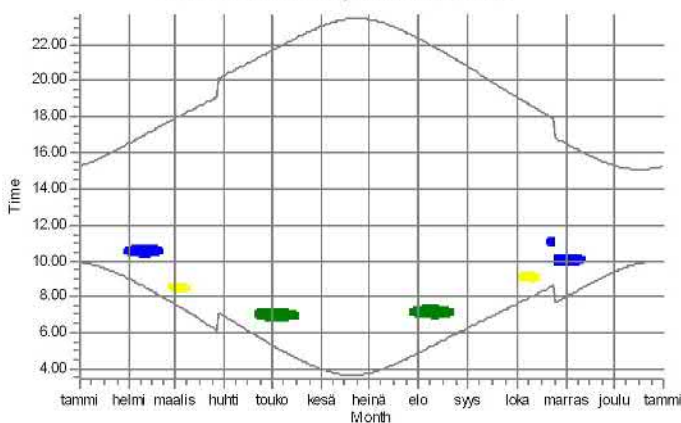
C: Lomarakennus C, ~Variksentie 93



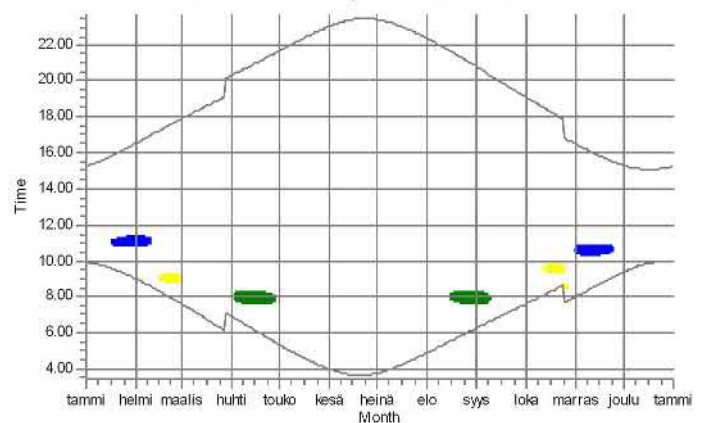
D: Asuinrakennus D, ~Kankaanpääntie 646



E: Asuinrakennus E, ~Välisalon tie 130



F: Asuinrakennus F, ~Välisalon tie 101



WTGs

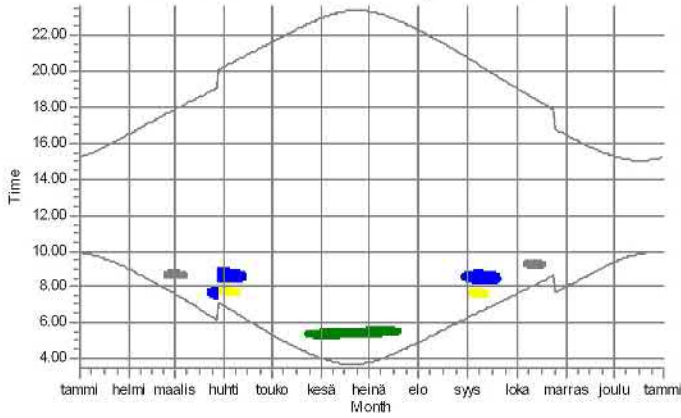
- 1: VESTAS V162-6.0 HH169 6000 162.0 10! hub: 219,0 m (TOT: 300,0 m) (689)
- 2: VESTAS V162-6.0 HH169 6000 162.0 10! hub: 219,0 m (TOT: 300,0 m) (690)
- 3: VESTAS V162-6.0 HH169 6000 162.0 10! hub: 219,0 m (TOT: 300,0 m) (691)

- 4: VESTAS V162-6.0 HH169 6000 162.0 10! hub: 219,0 m (TOT: 300,0 m) (692)
- 7: NORDEX N117/2400 2400 116.8 10! hub: 120,0 m (TOT: 178,4 m) (712)

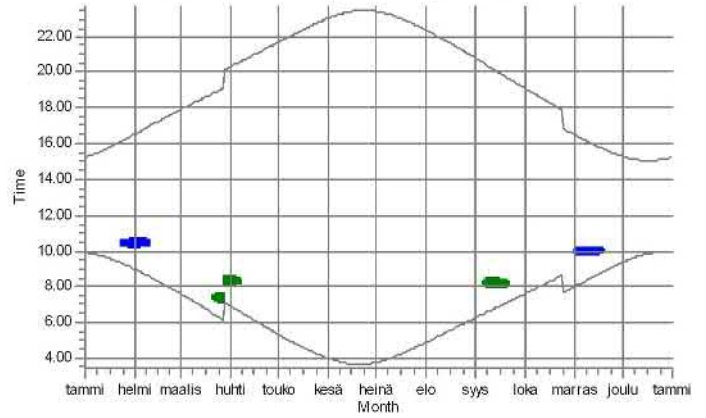
SHADOW - Calendar, graphical

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

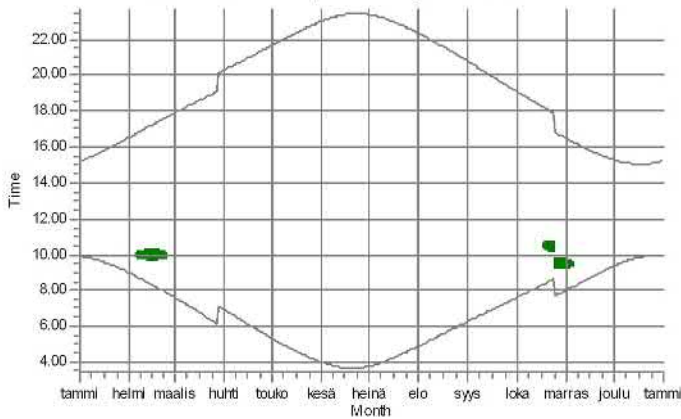
G: Asuinrakennus G, ~Kankaanpääntie 468



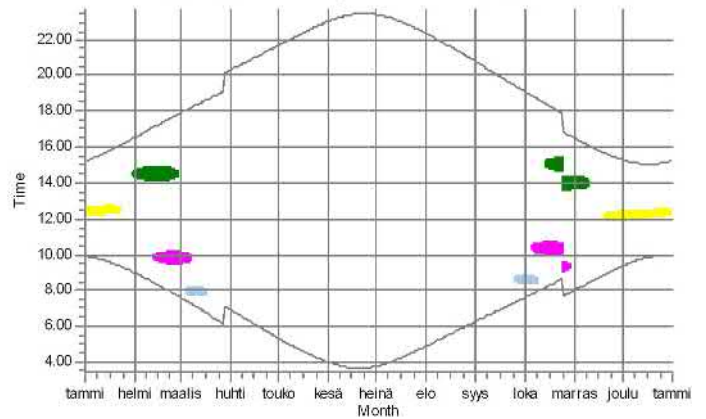
H: Lomarakennus H, ~Kankaanpääntie 320



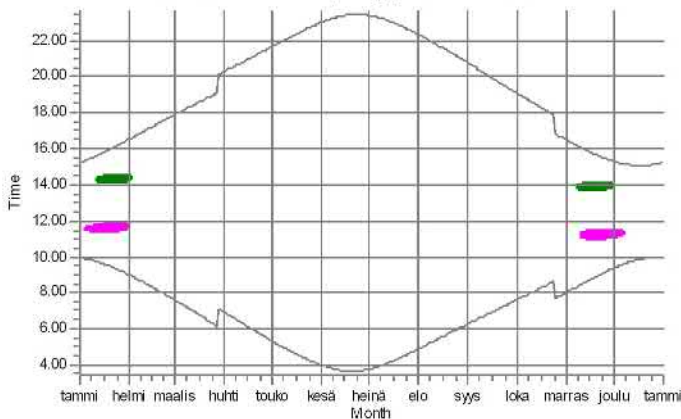
I: Asuinrakennus I, ~Kankaanpääntie 218



J: Asuinrakennus J, ~Penkkinevantie 85



K: Asuinrakennus K, ~Seppäkoskentie 36



WTGs

- 1: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (689)
- 2: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (690)
- 3: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (691)

- 4: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (692)
- 5: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (693)
- 15: NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (720)

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 1 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 14.18-14.37/19 16.32	07.37 17.52	06.57 08.10-08.35/25 20.16	05.21 06.47-07.20/33 21.38	04.01 05.13-05.33/20 22.59
2	09.54 15.17	08.57 14.21-14.40/19 16.35	07.34 17.55	06.54 08.09-08.33/24 20.19	05.18 06.47-07.20/33 21.41	03.59 05.12-05.33/21 23.01
3	09.53 15.18	08.54 14.19-14.42/23 16.38	07.31 17.58	06.50 08.10-08.32/22 20.22	05.15 06.46-07.19/33 21.44	03.57 05.12-05.33/21 23.03
4	09.53 15.20	08.51 14.18-14.43/25 16.40	07.28 18.01	06.47 08.11-08.31/20 20.24	05.12 06.47-07.20/33 21.47	03.55 05.12-05.34/22 23.05
5	09.52 15.22	08.49 14.17-14.45/28 16.43	07.24 18.03	06.44 07.52-08.29/37 20.27	05.09 06.47-07.19/32 21.49	03.54 05.13-05.34/21 23.07
6	09.51 15.24	08.46 14.16-14.46/30 16.46	07.21 18.06	06.41 08.13-08.26/13 20.30	05.06 06.46-07.18/32 21.52	03.52 05.13-05.35/22 23.09
7	09.49 15.26	08.43 14.15-14.48/33 16.49	07.18 18.09	06.37 08.16-08.22/6 20.32	05.03 06.47-07.18/31 21.55	03.51 05.13-05.35/22 23.11
8	09.48 15.28	08.40 14.14-14.48/34 16.52	07.15 18.12	06.34 07.46-08.15/29 20.35	05.00 06.47-07.17/30 21.58	03.49 05.13-05.35/22 23.13
9	09.47 15.30	08.37 14.14-14.49/35 16.55	07.12 18.14	06.31 07.45-08.15/30 20.38	04.58 06.48-07.17/29 22.00	03.48 05.13-05.35/22 23.14
10	09.46 15.32	08.35 14.13-14.50/37 16.58	07.08 18.17	06.28 07.44-08.16/32 20.40	04.55 06.48-07.16/28 22.03	03.47 05.13-05.35/22 23.16
11	09.44 15.35	08.32 14.13-14.50/37 17.01	07.05 18.20	06.24 07.43-08.17/34 20.43	04.52 06.49-07.15/26 22.06	03.46 05.14-05.36/22 23.17
12	09.43 14.15-14.19/4 15.37	08.29 14.12-14.50/38 17.04	07.02 18.23	06.21 07.42-08.17/35 20.46	04.49 06.50-07.14/24 22.09	03.45 05.13-05.36/23 23.18
13	09.41 14.13-14.21/8 15.40	08.26 14.12-14.50/38 17.07	06.59 18.25	06.18 07.42-08.17/35 20.49	04.46 06.51-07.13/22 22.11	03.44 05.14-05.36/22 23.20
14	09.39 14.13-14.24/11 15.42	08.23 14.12-14.51/39 17.10	06.55 18.28	06.15 07.41-08.16/35 20.51	04.43 06.52-07.12/20 22.14	03.43 05.14-05.36/22 23.21
15	09.38 14.11-14.25/14 15.44	08.20 14.13-14.51/38 17.13	06.52 18.31	06.11 07.40-08.16/36 20.54	04.41 06.53-07.10/17 22.17	03.43 05.14-05.37/23 23.22
16	09.36 14.11-14.26/15 15.47	08.17 14.12-14.50/38 17.15	06.49 18.33	06.08 07.40-08.15/35 20.57	04.38 06.55-07.08/13 22.20	03.42 05.15-05.37/22 23.22
17	09.34 14.11-14.28/17 15.50	08.14 14.12-14.50/38 17.18	06.46 18.36	06.05 07.40-08.15/35 20.59	04.35 06.58-07.05/7 22.22	03.42 05.14-05.36/22 23.23
18	09.32 14.11-14.28/17 15.52	08.11 14.13-14.50/37 17.21	06.42 18.39	06.02 07.40-08.14/34 21.02	04.33 22.25	03.41 05.15-05.37/22 23.24
19	09.30 14.10-14.29/19 15.55	08.08 14.14-14.50/36 17.24	06.39 18.41	05.59 07.41-08.14/33 21.05	04.30 22.28	03.41 05.15-05.37/22 23.24
20	09.28 14.10-14.30/20 15.58	08.05 14.13-14.49/36 17.27	06.36 18.44	05.55 07.41-08.13/32 21.08	04.28 22.30	03.41 05.15-05.37/22 23.25
21	09.26 14.10-14.30/20 16.00	08.02 14.14-14.48/34 17.30	06.33 18.47	05.52 07.42-08.12/30 21.10	04.25 22.33	03.41 05.16-05.38/22 23.25
22	09.24 14.10-14.31/21 16.03	07.59 14.16-14.47/31 17.33	06.29 07.22-07.28/6 18.49	05.49 07.42-08.10/28 21.13	04.23 22.35	03.41 05.16-05.38/22 23.25
23	09.21 14.10-14.31/21 16.06	07.56 14.16-14.45/29 17.35	06.26 07.18-07.32/14 18.52	05.46 07.43-08.09/26 21.16	04.20 05.20-05.25/5 22.38	03.41 05.16-05.38/22 23.26
24	09.19 14.10-14.31/21 16.09	07.53 14.18-14.44/26 17.38	06.23 07.16-07.34/18 18.55	05.43 07.44-08.07/23 21.19	04.18 05.18-05.27/9 22.41	03.42 05.16-05.38/22 23.25
25	09.17 14.11-14.31/20 16.12	07.50 14.20-14.43/23 17.41	06.20 07.13-07.34/21 18.57	05.40 07.46-08.06/20 21.21	04.15 05.16-05.28/12 22.43	03.42 05.16-05.38/22 23.25
26	09.14 14.11-14.32/21 16.14	07.46 14.22-14.39/17 17.44	06.16 07.12-07.35/23 19.00	05.37 07.48-08.03/15 21.24	04.13 05.15-05.29/14 22.45	03.43 05.17-05.39/22 23.25
27	09.12 14.12-14.32/20 16.17	07.43 14.27-14.35/8 17.47	06.13 07.11-07.35/24 19.03	05.34 07.51-07.59/8 21.27	04.11 05.14-05.30/16 22.48	03.44 05.17-05.39/22 23.25
28	09.09 14.12-14.31/19 16.20	07.40 17.50	06.10 07.10-07.35/25 19.05	05.30 06.48-07.19/31 21.30	04.09 05.14-05.31/17 22.50	03.44 05.17-05.39/22 23.24
29	09.07 14.13-14.31/18 16.23		07.07 08.10-08.35/25 20.08	05.27 06.47-07.19/32 21.33	04.07 05.13-05.31/18 22.53	03.45 05.17-05.40/23 23.24
30	09.04 14.14-14.31/17 16.26		07.03 08.09-08.35/26 20.11	05.24 06.47-07.19/32 21.35	04.05 05.13-05.32/19 22.55	03.46 05.18-05.40/22 23.23
31	09.02 14.16-14.31/15 16.29		07.00 08.09-08.35/26 20.14		04.03 05.12-05.32/20 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	338	1223	208	1050	573	658

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 1 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.47	05.18-05.40/22	04.55	07.00-07.25/25	06.18	07.42-08.15/33	07.36		08.00	13.43-14.19/36	09.22	
	23.22		22.19		20.44		19.06		16.29	09.18-09.40/22	15.18	
2	03.49	05.18-05.40/22	04.58	06.59-07.26/27	06.21	07.42-08.14/32	07.39		08.03	13.43-14.18/35	09.25	
	23.21		22.16		20.40		19.02		16.26	09.19-09.39/20	15.16	
3	03.50	05.18-05.40/22	05.00	06.58-07.26/28	06.23	07.43-08.13/30	07.41		08.06	13.44-14.18/34	09.27	
	23.20		22.13		20.37		18.59		16.23	09.21-09.38/17	15.15	
4	03.51	05.18-05.40/22	05.03	06.58-07.28/30	06.26	07.43-08.12/29	07.44		08.09	13.45-14.17/32	09.29	
	23.19		22.10		20.34		18.56		16.20	09.23-09.36/13	15.13	
5	03.53	05.18-05.40/22	05.06	06.57-07.28/31	06.29	08.14-08.18/4	07.46		08.12	13.46-14.16/30	09.31	
	23.18		22.07		20.31	07.44-08.11/27	18.53		16.18	09.26-09.33/7	15.12	
6	03.55	05.18-05.40/22	05.09	06.56-07.28/32	06.31	07.45-08.22/37	07.49		08.14	13.46-14.15/29	09.33	
	23.16		22.04		20.27		18.49		16.15		15.11	
7	03.56	05.19-05.41/22	05.11	06.56-07.28/32	06.34	07.47-08.24/37	07.52		08.17	13.48-14.14/26	09.35	
	23.15		22.01		20.24		18.46		16.12		15.10	
8	03.58	05.19-05.41/22	05.14	06.56-07.28/32	06.37	08.05-08.25/20	07.54		08.20	13.50-14.12/22	09.37	
	23.13		21.59		20.21	07.49-08.03/14	18.43		16.09		15.08	
9	04.00	05.20-05.41/21	05.17	06.56-07.29/33	06.39	08.04-08.26/22	07.57		08.23	13.51-14.10/19	09.39	
	23.12		21.56		20.17	07.55-07.58/3	18.40		16.07		15.07	
10	04.02	05.20-05.40/20	05.19	06.55-07.28/33	06.42	08.03-08.26/23	08.00		08.26	13.48-14.08/20	09.41	
	23.10		21.53		20.14		18.37		16.04		15.07	
11	04.04	05.20-05.41/21	05.22	06.55-07.28/33	06.44	08.02-08.27/25	08.02		08.29	13.47-14.01/14	09.43	
	23.08		21.50		20.11		18.33		16.01		15.06	
12	04.06	05.21-05.41/20	05.25	06.55-07.28/33	06.47	08.01-08.26/25	08.05		08.32	13.46-14.03/17	09.44	
	23.07		21.47		20.08		18.30		15.59		15.05	
13	04.08	05.21-05.40/19	05.28	06.55-07.27/32	06.49	08.01-08.27/26	08.08		08.34	13.45-14.03/18	09.46	
	23.05		21.44		20.04		18.27		15.56		15.05	
14	04.10	05.22-05.40/18	05.30	06.56-07.27/31	06.52	08.00-08.26/26	08.10		08.37	13.45-14.04/19	09.47	
	23.03		21.40		20.01		18.24		15.54		15.04	
15	04.12	05.22-05.40/18	05.33	06.56-07.26/30	06.55	08.00-08.26/26	08.13	14.58-15.10/12	08.40	13.45-14.04/19	09.49	
	23.01		21.37		19.58		18.21		15.51		15.04	
16	04.15	05.23-05.40/17	05.36	07.58-08.07/9	06.57	08.00-08.24/24	08.16	14.54-15.13/19	08.43	13.44-14.04/20	09.50	
	22.59		21.34	06.57-07.26/29	19.55		18.18		15.49		15.04	
17	04.17	05.24-05.39/15	05.38	07.54-08.10/16	07.00	08.01-08.24/23	08.18	14.51-15.15/24	08.46	13.45-14.05/20	09.51	
	22.57		21.31	06.57-07.25/28	19.51		18.14		15.46		15.03	
18	04.19	05.24-05.38/14	05.41	07.51-08.12/21	07.02	08.01-08.22/21	08.21	14.49-15.17/28	08.48	13.44-14.05/21	09.52	
	22.54		21.28	06.57-07.23/26	19.48		18.11	10.26-10.36/10	15.44		15.03	
19	04.22	05.26-05.37/11	05.44	07.50-08.14/24	07.05	08.02-08.21/19	08.24	14.48-15.18/30	08.51	13.45-14.06/21	09.53	
	22.52		21.25	06.59-07.22/23	19.45		18.08	10.23-10.39/16	15.41		15.04	
20	04.24	05.28-05.35/7	05.46	07.48-08.15/27	07.07	08.03-08.18/15	08.27	14.46-15.19/33	08.54	13.45-14.06/21	09.54	
	22.50		21.22	06.59-07.20/21	19.41		18.05	10.21-10.40/19	15.39		15.04	
21	04.26		05.49	07.47-08.16/29	07.10	08.06-08.15/9	08.29	14.45-15.19/34	08.57	13.46-14.06/20	09.54	
	22.47		21.19	07.02-07.19/17	19.38		18.02	10.20-10.42/22	15.37		15.04	
22	04.29		05.52	07.46-08.16/30	07.13		08.32	14.44-15.20/36	08.59	13.46-14.06/20	09.55	
	22.45		21.16	07.04-07.15/11	19.35		17.59	10.19-10.42/23	15.35		15.04	
23	04.31		05.54	07.46-08.17/31	07.15		08.35	14.44-15.20/36	09.02	13.47-14.06/19	09.55	
	22.43		21.12		19.32		17.56	10.18-10.43/25	15.33		15.05	
24	04.34		05.57	07.44-08.17/33	07.18		08.38	14.43-15.20/37	09.05	13.48-14.06/18	09.56	
	22.40		21.09		19.28		17.53	10.17-10.43/26	15.31		15.06	
25	04.37		06.00	07.44-08.18/34	07.20		07.40	13.42-14.20/38	09.07	13.48-14.05/17	09.56	
	22.37		21.06		19.25		16.50	09.17-09.43/26	15.29		15.06	
26	04.39		06.02	07.43-08.18/35	07.23		07.43	13.42-14.20/38	09.10	13.50-14.05/15	09.56	
	22.35		21.03		19.22		16.47	09.16-09.43/27	15.27		15.07	
27	04.42	07.07-07.17/10	06.05	07.43-08.18/35	07.26		07.46	13.42-14.20/38	09.13	13.51-14.04/13	09.56	
	22.32		21.00		19.19		16.44	09.16-09.43/27	15.25		15.08	
28	04.44	07.04-07.19/15	06.08	07.42-08.18/36	07.28		07.49	13.42-14.20/38	09.15	13.52-14.03/11	09.56	
	22.30		20.56		19.15		16.41	09.16-09.42/26	15.23		15.09	
29	04.47	07.04-07.21/17	06.10	07.41-08.17/36	07.31		07.52	13.42-14.20/38	09.18	13.54-14.03/9	09.56	
	22.27		20.53		19.12		16.38	09.16-09.42/26	15.21		15.11	
30	04.50	07.02-07.23/21	06.13	07.42-08.17/35	07.33		07.55	13.43-14.20/37	09.20	13.56-14.00/4	09.56	
	22.24		20.50		19.09		16.35	09.17-09.42/25	15.19		15.12	
31	04.52	07.01-07.24/23	06.16	07.41-08.16/35			07.57	13.43-14.20/37			09.55	
	22.21		20.47				16.32	09.18-09.41/23			15.13	
Potential sun hours	579		495		390		311		215		166	
Sum of minutes with flicker	463		1083		550		874		698		0	

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 2 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 12.15-12.33/18 15.15	08.59 16.32	07.37 08.24-08.42/18 17.52	06.57 07.38-07.54/16 20.16	05.21 21.38	04.01 22.59
2	09.54 12.16-12.34/18 15.17	08.57 16.35	07.34 08.23-08.41/18 17.55	06.54 07.36-07.54/18 20.19	05.18 21.41	03.59 23.01
3	09.53 12.15-12.34/19 15.18	08.54 16.38	07.31 08.22-08.42/20 17.58	06.50 07.35-07.54/19 20.21	05.15 21.44	03.57 23.03
4	09.52 12.15-12.35/20 15.20	08.51 16.40	07.28 08.22-08.42/20 18.01	06.47 07.35-07.54/19 20.24	05.12 21.46	03.55 23.05
5	09.51 12.17-12.36/19 15.22	08.48 16.43	07.24 08.21-08.42/21 18.03	06.44 07.35-07.54/19 20.27	05.09 21.49	03.54 23.07
6	09.50 12.17-12.37/20 15.24	08.46 16.46	07.21 08.22-08.41/19 18.06	06.40 07.35-07.54/19 20.30	05.06 21.52	03.52 23.09
7	09.49 12.16-12.36/20 15.26	08.43 16.49	07.18 08.22-08.41/19 18.09	06.37 07.35-07.52/17 20.32	05.03 21.55	03.51 23.11
8	09.48 12.17-12.37/20 15.28	08.40 16.52	07.15 08.22-08.39/17 18.12	06.34 07.35-07.51/16 20.35	05.00 21.58	03.50 23.12
9	09.47 12.17-12.38/21 15.30	08.37 16.55	07.12 08.24-08.38/14 18.14	06.31 07.36-07.50/14 20.38	04.58 22.00	03.48 23.14
10	09.45 12.18-12.38/20 15.33	08.34 16.58	07.08 08.26-08.36/10 18.17	06.28 07.38-07.47/9 20.40	04.55 22.03	03.47 23.15
11	09.44 12.18-12.38/20 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17
12	09.42 12.19-12.39/20 15.37	08.29 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 23.18
13	09.41 12.19-12.39/20 15.40	08.26 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19
14	09.39 12.20-12.40/20 15.42	08.23 17.10	06.55 18.28	06.15 20.51	04.44 22.14	03.43 23.20
15	09.37 12.20-12.40/20 15.45	08.20 17.13	06.52 18.31	06.11 20.54	04.41 22.17	03.43 23.21
16	09.36 12.21-12.39/18 15.47	08.17 09.02-09.07/5 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 23.22
17	09.34 12.22-12.40/18 15.50	08.14 08.59-09.10/11 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 23.23
18	09.32 12.23-12.40/17 15.52	08.11 08.57-09.12/15 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24
19	09.30 12.24-12.39/15 15.55	08.08 08.57-09.13/16 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 23.24
20	09.28 12.25-12.38/13 15.58	08.05 08.55-09.13/18 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 23.25
21	09.26 12.26-12.37/11 16.00	08.02 08.55-09.14/19 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 12.28-12.36/8 16.03	07.59 08.55-09.14/19 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 16.06	07.56 08.54-09.14/20 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.42 23.25
24	09.19 16.09	07.53 08.54-09.14/20 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 16.12	07.50 08.55-09.13/18 17.41	06.20 18.57	05.40 21.21	04.16 22.43	03.42 23.25
26	09.14 16.14	07.46 08.56-09.13/17 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 08.56-09.11/15 17.47	06.13 19.03	05.34 21.27	04.11 22.48	03.44 23.24
28	09.09 16.20	07.40 08.58-09.09/11 17.50	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24
29	09.07 16.23		07.07 20.08	05.27 21.32	04.07 22.52	03.45 23.23
30	09.04 16.26		07.03 07.42-07.51/9 20.11	05.24 21.35	04.05 22.55	03.46 23.23
31	09.02 16.29		07.00 07.39-07.53/14 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	395	234	199	166	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 2 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.22 12.00-12.20/20
	23.22	22.19	20.43	19.06	16.29	15.18
2	03.49	04.58	06.21 07.36-07.45/9	07.38	08.03	09.25 12.00-12.21/21
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.00	06.23 07.34-07.48/14	07.41 09.04-09.12/8	08.06	09.27 12.01-12.21/20
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.52	05.03	06.26 07.32-07.48/16	07.44 09.02-09.15/13	08.09	09.29 12.01-12.21/20
	23.19	22.10	20.34	18.56	16.21	15.13
5	03.53	05.06	06.29 07.32-07.49/17	07.46 09.00-09.16/16	08.12	09.31 12.02-12.21/19
	23.18	22.07	20.30	18.53	16.18	15.12
6	03.55	05.09	06.31 07.30-07.49/19	07.49 08.58-09.16/18	08.14	09.33 12.02-12.22/20
	23.16	22.04	20.27	18.49	16.15	15.11
7	03.56	05.11	06.34 07.30-07.49/19	07.52 08.58-09.17/19	08.17	09.35 12.03-12.22/19
	23.15	22.01	20.24	18.46	16.12	15.10
8	03.58	05.14	06.36 07.29-07.48/19	07.54 08.57-09.17/20	08.20	09.37 12.04-12.23/19
	23.13	21.58	20.21	18.43	16.09	15.09
9	04.00	05.17	06.39 07.30-07.48/18	07.57 08.57-09.17/20	08.23	09.39 12.05-12.23/18
	23.12	21.55	20.17	18.40	16.07	15.08
10	04.02	05.19	06.42 07.29-07.47/18	08.00 08.57-09.17/20	08.26	09.41 12.05-12.23/18
	23.10	21.52	20.14	18.37	16.04	15.07
11	04.04	05.22	06.44 07.30-07.46/16	08.02 08.56-09.16/20	08.29	09.43 12.05-12.23/18
	23.08	21.49	20.11	18.33	16.01	15.06
12	04.06	05.25	06.47 07.31-07.44/13	08.05 08.57-09.15/18	08.31	09.44 12.06-12.24/18
	23.06	21.46	20.08	18.30	15.59	15.05
13	04.08	05.28	06.49 07.33-07.42/9	08.08 09.33-09.39/6	08.34	09.46 12.07-12.24/17
	23.05	21.43	20.04	18.27 08.58-09.14/16	15.56	15.05
14	04.10	05.30	06.52	08.10 09.30-09.42/12	08.37	09.47 12.07-12.24/17
	23.03	21.40	20.01	18.24 08.59-09.12/13	15.54	15.04
15	04.12	05.33	06.55	08.13 09.29-09.44/15	08.40	09.48 12.08-12.25/17
	23.01	21.37	19.58	18.21 09.01-09.10/9	15.51	15.04
16	04.15	05.36	06.57	08.16 09.28-09.45/17	08.43	09.50 12.08-12.24/16
	22.59	21.34	19.55	18.18	15.49	15.04
17	04.17	05.38	07.00	08.18 09.27-09.45/18	08.46	09.51 12.09-12.25/16
	22.56	21.31	19.51	18.14	15.46	15.04
18	04.19	05.41	07.02	08.21 09.26-09.46/20	08.48	09.52 12.10-12.25/15
	22.54	21.28	19.48	18.11	15.44	15.03
19	04.22	05.44	07.05	08.24 09.26-09.46/20	08.51	09.53 12.10-12.26/16
	22.52	21.25	19.45	18.08	15.42	15.04
20	04.24	05.46	07.07	08.27 09.26-09.45/19	08.54 12.03-12.11/8	09.53 12.11-12.26/15
	22.50	21.22	19.41	18.05	15.39	15.04
21	04.27	05.49	07.10	08.29 09.26-09.45/19	08.57 12.02-12.13/11	09.54 12.11-12.27/16
	22.47	21.19	19.38	18.02	15.37	15.04
22	04.29	05.52	07.13	08.32 09.26-09.44/18	08.59 12.01-12.14/13	09.55 12.11-12.27/16
	22.45	21.15	19.35	17.59	15.35	15.05
23	04.32	05.54	07.15	08.35 09.27-09.43/16	09.02 12.01-12.16/15	09.55 12.13-12.28/15
	22.42	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57	07.18	08.38 09.28-09.42/14	09.05 12.00-12.17/17	09.56 12.13-12.28/15
	22.40	21.09	19.28	17.53	15.31	15.06
25	04.37	06.00	07.20	07.40 08.30-08.40/10	09.07 11.59-12.17/18	09.56 12.13-12.29/16
	22.37	21.06	19.25	16.50	15.29	15.06
26	04.39	06.02	07.23	07.43 08.34-08.35/1	09.10 12.00-12.18/18	09.56 12.13-12.29/16
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05	07.25	07.46	09.12 11.59-12.19/20	09.56 12.14-12.30/16
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.44	06.08	07.28	07.49	09.15 11.59-12.19/20	09.56 12.14-12.30/16
	22.30	20.56	19.15	16.41	15.23	15.09
29	04.47	06.10	07.31	07.52	09.17 12.00-12.20/20	09.56 12.14-12.31/17
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13	07.33	07.54	09.20 12.00-12.20/20	09.56 12.14-12.31/17
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16		07.57		09.55 12.15-12.32/17
	22.21	20.47		16.32		15.13
Potential sun hours	578	495	390	311	215	166
Sum of minutes with flicker	0	0	187	415	180	536

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-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 3 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 10.19-10.42/23 16.32 10.53-11.19/26	07.37 17.52	06.57 08.21-08.58/37 20.16	05.21 21.38	04.01 06.06-06.45/39 22.59
2	09.54 15.17	08.57 10.20-10.44/24 16.35 10.53-11.19/26	07.34 17.55	06.54 08.20-08.57/37 20.19	05.18 21.41	03.59 06.06-06.44/38 23.01
3	09.53 15.19	08.54 10.19-10.45/26 16.38 10.53-11.18/25	07.31 17.58	06.50 08.20-08.57/37 20.22	05.15 21.44	03.57 06.06-06.45/39 23.03
4	09.52 15.20	08.51 10.20-10.46/26 16.41 10.54-11.18/24	07.28 18.01	06.47 08.20-08.57/37 20.24	05.12 21.46	03.56 06.07-06.45/38 23.05
5	09.51 15.22	08.49 10.20-10.47/27 16.44 10.55-11.18/23	07.24 18.03	06.44 08.20-08.56/36 20.27	05.09 21.49	03.54 06.07-06.45/38 23.07
6	09.50 15.24	08.46 10.20-10.48/28 16.46 10.56-11.17/21	07.21 18.06	06.41 08.20-08.56/36 20.30	05.06 21.52	03.52 06.07-06.45/38 23.09
7	09.49 15.26	08.43 10.20-10.49/29 16.49 10.57-11.16/19	07.18 18.09	06.37 08.20-08.54/34 20.32	05.03 21.55	03.51 06.08-06.45/37 23.11
8	09.48 15.28	08.40 10.19-10.48/29 16.52 10.58-11.14/16	07.15 18.12	06.34 08.20-08.53/33 20.35	05.01 21.58	03.50 06.08-06.45/37 23.12
9	09.47 15.30	08.37 10.19-10.49/30 16.55 11.00-11.12/12	07.12 18.14	06.31 08.21-08.52/31 20.38	04.58 06.20-06.29/9 22.00	03.48 06.08-06.45/37 23.14
10	09.45 15.33	08.35 10.19-10.49/30 16.58 10.59-11.13/14	07.08 18.17	06.28 08.22-08.51/29 20.40	04.55 06.16-06.32/16 22.03	03.47 06.08-06.45/37 23.15
11	09.44 15.35	08.32 10.19-10.50/31 17.01 10.59-11.13/14	07.05 18.20	06.24 08.22-08.49/27 20.43	04.52 06.15-06.34/19 22.06	03.46 06.09-06.46/37 23.17
12	09.43 15.37	08.29 10.20-10.50/30 17.04 10.59-11.13/14	07.02 18.23	06.21 08.24-08.47/23 20.46	04.49 06.12-06.35/23 22.09	03.45 06.09-06.45/36 23.18
13	09.41 15.40	08.26 10.19-10.49/30 17.07 10.59-11.13/14	06.59 18.25	06.18 08.25-08.45/20 20.49	04.46 06.11-06.37/26 22.11	03.44 06.10-06.46/36 23.19
14	09.39 15.42	08.23 10.20-10.49/29 17.10 10.59-11.13/14	06.55 18.28	06.15 08.27-08.41/14 20.51	04.44 06.10-06.38/28 22.14	03.43 06.09-06.45/36 23.20
15	09.37 15.45	08.20 10.21-10.49/28 17.13 10.59-11.13/14	06.52 18.31	06.12 08.27-08.41/14 20.54	04.41 06.09-06.38/29 22.17	03.43 06.10-06.46/36 23.21
16	09.36 15.47	08.17 10.21-10.47/26 17.16 10.59-11.13/14	06.49 18.33	06.08 08.27-08.41/14 20.57	04.38 06.08-06.39/31 22.20	03.42 06.10-06.46/36 23.22
17	09.34 15.50	08.14 10.22-10.46/24 17.18 10.59-11.13/14	06.46 18.36	06.05 08.27-08.41/14 20.59	04.36 06.08-06.40/32 22.22	03.42 06.10-06.46/36 23.23
18	09.32 15.52	11.00-11.05/5 08.11 10.23-10.45/22	06.43 18.39	06.02 08.27-08.41/14 21.02	04.33 06.07-06.41/34 22.25	03.42 06.10-06.46/36 23.24
19	09.30 15.55	10.57-11.08/11 08.08 10.25-10.44/19	06.39 18.41	05.59 08.27-08.41/14 21.05	04.30 06.07-06.42/35 22.28	03.41 06.10-06.46/36 23.24
20	09.28 15.58	10.56-11.10/14 08.05 10.26-10.41/15	06.36 18.44	05.56 08.27-08.41/14 21.08	04.28 06.07-06.42/35 22.30	03.41 06.11-06.46/35 23.25
21	09.26 16.00	10.54-11.11/17 08.02 10.31-10.36/5	06.33 18.47	05.52 08.27-08.41/14 21.10	04.25 06.05-06.42/37 22.33	03.41 06.12-06.47/35 23.25
22	09.23 16.03	10.54-11.13/19 07.59 10.31-10.36/5	06.29 18.50	05.49 08.27-08.41/14 21.13	04.23 06.06-06.43/37 22.35	03.41 06.12-06.47/35 23.25
23	09.21 16.06	10.26-10.30/4 10.53-11.14/21	07.56 17.36	07.36-07.49/13 06.26 07.36-07.49/13	05.46 08.27-08.41/14 21.16	03.42 06.12-06.47/35 23.25
24	09.19 16.09	10.23-10.33/10 10.52-11.15/23	07.53 17.38	07.33-07.52/19 18.55	05.43 08.27-08.41/14 21.19	03.42 06.12-06.48/36 23.25
25	09.17 16.12	10.21-10.35/14 10.52-11.15/23	07.50 17.41	07.29-07.53/24 18.58	05.40 08.27-08.41/14 21.21	03.42 06.12-06.48/36 23.25
26	09.14 16.14	10.20-10.36/16 10.52-11.16/24	07.46 17.44	07.28-07.55/27 19.00	05.37 08.27-08.41/14 21.24	03.43 06.13-06.48/35 23.25
27	09.12 16.17	10.20-10.37/17 10.52-11.17/25	07.43 17.47	07.26-07.56/30 19.03	05.34 08.27-08.41/14 21.27	03.44 06.12-06.48/36 23.25
28	09.09 16.20	10.19-10.38/19 10.52-11.17/25	07.40 17.50	07.24-07.56/32 19.06	05.31 08.27-08.41/14 21.30	03.45 06.13-06.49/36 23.24
29	09.07 16.23	10.19-10.39/20 10.52-11.18/26	07.37 17.53	08.23-08.57/34 19.07	05.27 08.27-08.41/14 21.33	03.46 06.13-06.49/36 23.23
30	09.04 16.26	10.19-10.40/21 10.52-11.18/26	07.34 17.56	08.22-08.57/35 19.10	05.24 08.27-08.41/14 21.35	03.47 06.13-06.50/37 23.23
31	09.02 16.29	10.19-10.40/21 10.52-11.19/27	07.31 17.59	08.22-08.58/36 19.13	05.21 08.27-08.41/14 21.38	03.48 06.13-06.50/37 23.23
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	428	723	250	431	735	1095

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 3 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	July		August		September		October		November		December	
1	03.48	06.13-06.50/37	04.55	06.24-06.46/22	06.18	08.21-08.48/27	07.36	08.00	09.48-10.19/31	09.22		
	23.22		22.19		20.44		19.06	16.29	10.33-10.38/5	15.18		
2	03.49	06.13-06.50/37	04.58	06.26-06.44/18	06.21	08.19-08.49/30	07.39	08.03	09.48-10.18/30	09.25		
	23.21		22.16		20.40		19.02	16.26	10.29-10.42/13	15.16		
3	03.50	06.13-06.50/37	05.01	06.28-06.41/13	06.24	08.19-08.50/31	07.41	08.06	09.49-10.19/30	09.27		
	23.20		22.13		20.37		18.59	16.23	10.28-10.45/17	15.15		
4	03.52	06.13-06.51/38	05.03	06.33-06.37/4	06.26	08.17-08.50/33	07.44	08.09	09.49-10.18/29	09.29		
	23.19		22.10		20.34		18.56	16.21	10.26-10.46/20	15.13		
5	03.53	06.13-06.51/38	05.06		06.29	08.17-08.51/34	07.46	08.12	09.50-10.17/27	09.31		
	23.18		22.07		20.31		18.53	16.18	10.25-10.47/22	15.12		
6	03.55	06.13-06.51/38	05.09		06.31	08.15-08.51/36	07.49	08.14	09.50-10.16/26	09.33		
	23.16		22.04		20.27		18.49	16.15	10.24-10.47/23	15.11		
7	03.56	06.14-06.52/38	05.11		06.34	08.15-08.51/36	07.52	08.17	09.50-10.16/26	09.35		
	23.15		22.01		20.24		18.46	16.12	10.24-10.49/25	15.10		
8	03.58	06.13-06.51/38	05.14		06.37	08.14-08.51/37	07.54	08.20	09.50-10.15/25	09.37		
	23.13		21.59		20.21		18.43	16.09	10.24-10.49/25	15.09		
9	04.00	06.14-06.52/38	05.17		06.39	08.14-08.51/37	07.57	08.23	09.50-10.15/25	09.39		
	23.12		21.56		20.18		18.40	16.07	10.24-10.50/26	15.08		
10	04.02	06.13-06.52/39	05.20		06.42	08.13-08.50/37	08.00	08.26	09.50-10.13/23	09.41		
	23.10		21.53		20.14		18.37	16.04	10.23-10.50/27	15.07		
11	04.04	06.14-06.52/38	05.22		06.44	08.14-08.50/36	08.02	08.29	09.50-10.11/21	09.43		
	23.08		21.50		20.11		18.33	16.01	10.23-10.50/27	15.06		
12	04.06	06.14-06.53/39	05.25		06.47	08.13-08.49/36	08.05	08.32	09.51-10.11/20	09.44		
	23.07		21.47		20.08		18.30	15.59	10.24-10.50/26	15.05		
13	04.08	06.14-06.52/38	05.28		06.49	08.14-08.49/35	08.08	08.34	09.51-10.11/20	09.46		
	23.05		21.43		20.04		18.27	15.56	10.24-10.50/26	15.05		
14	04.10	06.14-06.53/39	05.30		06.52	08.13-08.47/34	08.10	08.37	09.52-10.11/19	09.47		
	23.03		21.40		20.01		18.24	15.54	10.25-10.50/25	15.04		
15	04.12	06.14-06.53/39	05.33		06.55	08.14-08.46/32	08.13	08.40	09.53-10.10/17	09.48		
	23.01		21.37		19.58		18.21	15.51	10.25-10.50/25	15.04		
16	04.15	06.15-06.53/38	05.36		06.57	08.14-08.45/31	08.16	08.43	09.53-10.09/16	09.50		
	22.59		21.34		19.55		18.18	15.49	10.25-10.49/24	15.04		
17	04.17	06.15-06.54/39	05.38		07.00	08.16-08.44/28	08.18	08.46	09.55-10.09/14	09.51		
	22.56		21.31		19.51		18.15	15.46	10.26-10.49/23	15.04		
18	04.19	06.14-06.53/39	05.41		07.02	08.17-08.41/24	08.21	08.48	09.57-10.07/10	09.52		
	22.54		21.28		19.48		18.11	15.44	10.26-10.49/23	15.04		
19	04.22	06.15-06.53/38	05.44		07.05	08.19-08.39/20	08.24	08.51	10.01-10.05/4	09.53		
	22.52		21.25		19.45		18.08	15.42	10.28-10.49/21	15.04		
20	04.24	06.15-06.52/37	05.47		07.07	08.21-08.36/15	08.27	08.54	10.29-10.48/19	09.54		
	22.50		21.22		19.42		18.05	15.39		15.04		
21	04.27	06.15-06.52/37	05.49		07.10	08.26-08.30/4	08.29	08.57	11.00-11.09/9	09.54		
	22.47		21.19		19.38		18.02	15.37	10.30-10.47/17	15.04		
22	04.29	06.16-06.53/37	05.52		07.13		08.32	08.59	10.32-10.46/14	09.55		
	22.45		21.16		19.35		17.59	15.35		15.05		
23	04.32	06.17-06.53/36	05.55		07.15		08.35	10.54-11.14/20	09.02	10.34-10.45/11	09.55	
	22.42		21.12		19.32		17.56	15.33		15.05		
24	04.34	06.17-06.52/35	05.57		07.18		08.38	10.53-11.16/23	09.05	10.37-10.42/5	09.56	
	22.40		21.09		19.28		17.53	15.31		15.06		
25	04.37	06.17-06.51/34	06.00		07.20		07.40	09.52-10.17/25	09.07		09.56	
	22.37		21.06		19.25		16.50	15.29		15.07		
26	04.39	06.18-06.51/33	06.03		07.23		07.43	09.51-10.17/26	09.10		09.56	
	22.35		21.03		19.22		16.47	15.27		15.07		
27	04.42	06.18-06.50/32	06.05		07.26		07.46	09.50-10.18/28	09.12		09.56	
	22.32		21.00		19.19		16.44	15.25		15.08		
28	04.45	06.20-06.50/30	06.08	08.34-08.37/3	07.28		07.49	09.49-10.18/29	09.15		09.56	
	22.30		20.56		19.15		16.41	15.23		15.10		
29	04.47	06.20-06.49/29	06.10	08.29-08.43/14	07.31		07.52	09.48-10.18/30	09.17		09.56	
	22.27		20.53		19.12		16.38	15.21		15.11		
30	04.50	06.21-06.48/27	06.13	08.25-08.45/20	07.33		07.55	09.49-10.19/30	09.20		09.56	
	22.24		20.50		19.09		16.35	15.19		15.12		
31	04.52	06.22-06.46/24	06.16	08.23-08.46/23			07.57	09.49-10.19/30			09.55	
	22.21		20.47				16.32			15.13		
Potential sun hours	578		495		390		311		215		167	
Sum of minutes with flicker	1116		117		633		265		902		0	

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 4 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June		
1	09.54 15.15	08.59 16.32	07.37 17.52	08.32-08.53/21	06.57 20.16	08.23-08.34/11	05.21 21.38	04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 17.55	08.31-08.52/21	06.54 20.19		05.18 21.41	03.59 23.01
3	09.53 15.19	08.54 16.38	07.31 17.58	08.32-08.52/20	06.50 20.22	19.17-19.24/7	05.15 21.44	03.57 23.03
4	09.52 15.20	08.51 16.41	07.28 18.01	08.32-08.51/19	06.47 20.24	19.13-19.27/14	05.12 21.46	03.56 23.05
5	09.51 15.22	08.48 16.43	07.24 18.03	08.32-08.50/18	06.44 20.27	19.10-19.29/19	05.09 21.49	03.54 23.07
6	09.50 15.24	08.46 16.46	07.21 18.06	08.33-08.49/16	06.41 20.30	19.08-19.30/22	05.06 21.52	03.52 23.09
7	09.49 15.26	08.43 16.49	07.18 18.09	08.35-08.47/12	06.37 20.32	19.07-19.31/24	05.03 21.55	03.51 23.11
8	09.48 15.28	08.40 16.52	07.15 18.12	08.37-08.43/6	06.34 20.35	19.06-19.32/26	05.01 21.58	03.50 23.12
9	09.47 15.30	08.37 16.55	07.12 18.14		06.31 20.38	19.05-19.32/27	04.58 22.00	03.48 23.14
10	09.45 15.33	08.34 16.58	07.08 18.17		06.28 20.40	19.05-19.32/27	04.55 22.03	03.47 23.15
11	09.44 15.35	08.32 17.01	07.05 18.20		06.24 20.43	19.04-19.33/29	04.52 22.06	03.46 23.17
12	09.42 15.37	08.29 17.04	07.02 18.23		06.21 20.46	19.03-19.31/28	04.49 22.09	03.45 23.18
13	09.41 15.40	08.26 17.07	06.59 18.25		06.18 20.48	19.03-19.31/28	04.46 22.11	03.44 23.19
14	09.39 15.42	08.23 17.10	06.55 18.28		06.15 20.51	19.03-19.31/28	04.44 22.14	03.44 23.20
15	09.37 15.45	08.20 17.13	06.52 18.31		06.11 20.54	19.03-19.30/27	04.41 22.17	03.43 23.21
16	09.36 15.47	08.17 17.16	06.49 18.33		06.08 20.57	19.03-19.29/26	04.38 22.19	03.42 23.22
17	09.34 15.50	08.14 17.18	06.46 18.36		06.05 20.59	19.04-19.28/24	04.36 22.22	03.42 23.23
18	09.32 15.52	08.11 17.21	06.42 18.39	07.32-07.34/2	06.02 21.02	19.05-19.27/22	04.33 22.25	03.42 23.24
19	09.30 15.55	08.08 17.24	06.39 18.41	07.27-07.39/12	05.59 21.05	19.06-19.26/20	04.30 22.27	03.41 23.24
20	09.28 15.58	08.05 17.27	06.36 18.44	07.25-07.41/16	05.56 21.08	19.07-19.24/17	04.28 22.30	03.41 23.25
21	09.26 16.00	08.02 17.30	06.33 18.47	07.22-07.41/19	05.52 21.10	19.10-19.22/12	04.25 22.33	03.41 23.25
22	09.23 16.03	07.59 17.33	06.29 18.49	07.21-07.42/21	05.49 21.13	19.15-19.16/1	04.23 22.35	03.41 23.25
23	09.21 16.06	07.56 17.36	06.26 18.52	07.20-07.43/23	05.46 21.16		04.20 22.38	03.42 23.25
24	09.19 16.09	07.53 17.38	06.23 18.55	08.37-08.48/11	05.43 21.19		04.18 22.40	03.42 23.25
25	09.17 16.12	07.50 17.41	06.20 18.57	08.36-08.50/14	05.40 21.21		04.16 22.43	03.43 23.25
26	09.14 16.14	07.46 17.44	06.16 19.00	08.35-08.51/16	05.37 21.24		04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 17.47	06.13 19.03	08.33-08.51/18	05.34 21.27		04.11 22.48	03.44 23.24
28	09.09 16.20	07.40 17.50	06.10 19.05	08.32-08.52/20	05.31 21.30		04.09 22.50	03.45 23.24
29	09.07 16.23		07.07 20.08	08.19-08.39/20	05.27 21.32		04.07 22.52	03.46 23.23
30	09.04 16.26		07.03 20.11	08.20-08.38/18	05.24 21.35		04.05 22.55	03.47 23.23
31	09.02 16.29		07.00 20.13	08.21-08.36/15			04.03 22.57	
Potential sun hours	194	247	364	443	547		586	849
Sum of minutes with flicker	0	80	393	439	249			

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 4 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692) Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.48	05.37-06.06/29	04.55		06.18	19.03-19.31/28	07.36		08.00	09.22		
	23.22		22.19		20.43		19.06		16.29	15.18		
2	03.49	05.38-06.06/28	04.58		06.21	19.03-19.30/27	07.38		08.03	09.24		
	23.21		22.16		20.40		19.02		16.26	15.16		
3	03.50	05.38-06.06/28	05.01		06.24	19.03-19.30/27	07.41		08.06	09.27		
	23.20		22.13		20.37		18.59		16.23	15.15		
4	03.52	05.38-06.06/28	05.03		06.26	19.03-19.29/26	07.44		08.09	09.29		
	23.19		22.10		20.34		18.56		16.21	15.13		
5	03.53	05.38-06.06/28	05.06		06.29	19.04-19.28/24	07.46		08.11	09.31		
	23.17		22.07		20.30		18.53		16.18	15.12		
6	03.55	05.39-06.07/28	05.09		06.31	19.04-19.26/22	07.49	09.12-09.21/9	08.14	09.33		
	23.16		22.04		20.27		18.49		16.15	15.11		
7	03.57	05.38-06.07/29	05.11		06.34	19.06-19.25/19	07.52	09.10-09.23/13	08.17	09.35		
	23.15		22.01		20.24		18.46		16.12	15.10		
8	03.58	05.38-06.06/28	05.14		06.37	19.07-19.22/15	07.54	09.08-09.25/17	08.20	09.37		
	23.13		21.58		20.21		18.43		16.09	15.09		
9	04.00	05.39-06.07/28	05.17		06.39	19.09-19.18/9	07.57	09.07-09.26/19	08.23	09.39		
	23.12		21.55		20.17		18.40		16.07	15.08		
10	04.02	05.39-06.06/27	05.20		06.42		08.00	09.07-09.26/19	08.26	09.41		
	23.10		21.52		20.14		18.37		16.04	15.07		
11	04.04	05.40-06.07/27	05.22		06.44	08.16-08.26/10	08.02	09.05-09.25/20	08.29	09.42		
	23.08		21.49		20.11		18.33		16.01	15.06		
12	04.06	05.40-06.07/27	05.25		06.47	08.13-08.28/15	08.05	09.05-09.25/20	08.31	09.44		
	23.06		21.46		20.08		18.30		15.59	15.05		
13	04.08	05.40-06.06/26	05.28		06.49	08.11-08.29/18	08.08	09.05-09.25/20	08.34	09.46		
	23.05		21.43		20.04		18.27		15.56	15.05		
14	04.10	05.41-06.06/25	05.30		06.52	08.10-08.30/20	08.10	09.05-09.25/20	08.37	09.47		
	23.03		21.40		20.01		18.24		15.54	15.04		
15	04.12	05.41-06.06/25	05.33		06.55	08.09-08.31/22	08.13	09.06-09.24/18	08.40	09.48		
	23.01		21.37		19.58		18.21		15.51	15.04		
16	04.15	05.42-06.06/24	05.36		06.57	08.07-08.30/23	08.16	09.07-09.23/16	08.43	09.50		
	22.58		21.34		19.55		18.18		15.49	15.04		
17	04.17	05.43-06.06/23	05.38		07.00	08.07-08.31/24	08.18	09.08-09.21/13	08.46	09.51		
	22.56		21.31		19.51		18.14		15.46	15.04		
18	04.19	05.43-06.06/23	05.41		07.02	08.06-08.30/24	08.21	09.10-09.19/9	08.48	09.52		
	22.54		21.28		19.48		18.11		15.44	15.04		
19	04.22	05.43-06.04/21	05.44		07.05	08.07-08.30/23	08.24		08.51	09.53		
	22.52		21.25		19.45		18.08		15.42	15.04		
20	04.24	05.44-06.03/19	05.46		07.07	08.06-08.28/22	08.27		08.54	09.53		
	22.50		21.22		19.41		18.05		15.39	15.04		
21	04.27	05.46-06.04/18	05.49	19.18-19.24/6	07.10	08.07-08.28/21	08.29		08.57	09.54		
	22.47		21.19		19.38		18.02		15.37	15.04		
22	04.29	05.47-06.02/15	05.52	19.14-19.27/13	07.13	08.07-08.26/19	08.32		08.59	09.55		
	22.45		21.15		19.35		17.59		15.35	15.05		
23	04.32	05.49-06.01/12	05.55	19.12-19.29/17	07.15	08.08-08.25/17	08.35		09.02	09.55		
	22.42		21.12		19.32		17.56		15.33	15.05		
24	04.34	05.51-05.58/7	05.57	19.09-19.30/21	07.18	08.10-08.23/13	08.38		09.05	09.56		
	22.40		21.09		19.28		17.53		15.31	15.06		
25	04.37		06.00	19.07-19.30/23	07.20	08.12-08.19/7	07.40		09.07	09.56		
	22.37		21.06		19.25		16.50		15.29	15.07		
26	04.39		06.02	19.07-19.31/24	07.23		07.43		09.10	09.56		
	22.35		21.03		19.22		16.47		15.27	15.07		
27	04.42		06.05	19.05-19.31/26	07.25		07.46		09.12	09.56		
	22.32		21.00		19.19		16.44		15.25	15.08		
28	04.45		06.08	19.05-19.32/27	07.28		07.49		09.15	09.56		
	22.29		20.56		19.15		16.41		15.23	15.10		
29	04.47		06.10	19.04-19.32/28	07.31		07.52		09.17	09.56		
	22.27		20.53		19.12		16.38		15.21	15.11		
30	04.50		06.13	19.04-19.32/28	07.33		07.54		09.20	09.55		
	22.24		20.50		19.09		16.35		15.19	15.12		
31	04.52		06.16	19.03-19.31/28			07.57			09.55		
	22.21		20.47				16.32			15.13		
Potential sun hours	578		495		390		311		215	0	167	0
Sum of minutes with flicker		573		241		475		213		0		0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 5 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (693)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 16.32	07.37 09.34-10.06/32 17.52	06.57 20.16	05.21 21.38	04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 09.34-10.04/30 17.55	06.53 20.19	05.18 21.41	03.59 23.01
3	09.53 15.18	08.54 16.37	07.31 09.35-10.04/29 17.58	06.50 20.21	05.15 21.44	03.57 23.03
4	09.52 15.20	11.32-11.35/3 08.51 16.40	07.27 09.36-10.02/26 18.01	06.47 20.24	05.12 21.46	03.55 23.05
5	09.52 15.22	11.30-11.37/7 08.49 16.43	07.24 09.37-10.00/23 18.03	06.44 20.27	05.09 21.49	03.54 23.07
6	09.50 15.24	11.29-11.39/10 08.46 16.46	07.21 09.39-09.58/19 18.06	06.40 20.30	05.06 21.52	03.52 23.09
7	09.49 15.26	11.27-11.41/14 08.43 16.49	07.18 09.42-09.54/12 18.09	06.37 20.32	05.03 21.55	03.51 23.11
8	09.48 15.28	11.27-11.40/13 08.40 16.52	07.15 18.12	06.34 20.35	05.00 21.58	03.49 23.12
9	09.47 15.30	11.27-11.41/14 08.37 16.55	07.12 18.14	06.31 20.38	04.57 22.00	03.48 23.14
10	09.46 15.32	11.27-11.43/16 08.35 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.16
11	09.44 15.35	11.26-11.43/17 08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17
12	09.43 15.37	11.26-11.45/19 08.29 17.04	07.02 18.22	06.21 20.46	04.49 22.09	03.45 23.18
13	09.41 15.39	11.26-11.45/19 08.26 09.48-09.54/6 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19
14	09.39 15.42	11.26-11.47/21 08.23 09.44-09.59/15 17.10	06.55 18.28	06.15 20.51	04.43 22.14	03.43 23.21
15	09.37 15.44	11.26-11.47/21 08.20 09.42-10.01/19 17.12	06.52 18.31	06.11 20.54	04.41 22.17	03.42 23.22
16	09.36 15.47	11.26-11.47/21 08.17 09.39-10.02/23 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 23.22
17	09.34 15.50	11.26-11.49/23 08.14 09.38-10.04/26 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 23.23
18	09.32 15.52	11.26-11.49/23 08.11 09.37-10.05/28 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24
19	09.30 15.55	11.26-11.49/23 08.08 09.36-10.06/30 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 23.24
20	09.28 15.58	11.26-11.50/24 08.05 09.35-10.06/31 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 23.25
21	09.26 16.00	11.27-11.50/23 08.02 09.34-10.07/33 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 16.03	11.27-11.50/23 07.59 09.34-10.08/34 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 16.06	11.27-11.50/23 07.56 09.33-10.07/34 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25
24	09.19 16.09	11.28-11.50/22 07.53 09.33-10.08/35 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 16.11	11.28-11.50/22 07.49 09.33-10.08/35 17.41	06.20 18.57	05.40 21.21	04.15 22.43	03.42 23.25
26	09.14 16.14	11.29-11.50/21 07.46 09.32-10.07/35 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 16.17	11.30-11.50/20 07.43 09.33-10.07/34 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.25
28	09.09 16.20	11.31-11.49/18 07.40 09.33-10.07/34 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24
29	09.07 16.23	11.32-11.49/17 	07.06 20.08	05.27 21.32	04.07 22.52	03.45 23.23
30	09.04 16.26	11.34-11.47/13 	07.03 20.11	05.24 21.35	04.05 22.55	03.46 23.23
31	09.02 16.29	11.36-11.46/10 	07.00 20.13	 	04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	486	452	171	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 5 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (693)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.47	04.55	06.18	07.36	08.00	09.22 11.08-11.25/17
	23.22	22.19	20.43	19.05	16.29	15.18
2	03.49	04.58	06.21	07.38	08.03	09.25 11.09-11.25/16
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.00	06.23	07.41	08.06	09.27 11.11-11.26/15
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.51	05.03	06.26	07.44	08.09	09.29 11.12-11.25/13
	23.19	22.10	20.34	18.56	16.20	15.13
5	03.53	05.06	06.29	07.46	08.12	09.31 11.14-11.24/10
	23.18	22.07	20.30	18.53	16.18	15.12
6	03.55	05.08	06.31	07.49	10.20-10.27/7	08.14
	23.16	22.04	20.27	18.49	16.15	15.11
7	03.56	05.11	06.34	07.52	10.16-10.32/16	08.17
	23.15	22.01	20.24	18.46	16.12	15.09
8	03.58	05.14	06.36	07.54	10.13-10.34/21	08.20
	23.13	21.58	20.21	18.43	16.09	15.08
9	04.00	05.17	06.39	07.57	10.12-10.36/24	08.23
	23.12	21.55	20.17	18.40	16.07	15.07
10	04.02	05.19	06.42	08.00	10.09-10.37/28	08.26
	23.10	21.53	20.14	18.36	16.04	15.07
11	04.04	05.22	06.44	08.02	10.08-10.38/30	08.29 11.07-11.17/10
	23.08	21.49	20.11	18.33	16.01	15.06
12	04.06	05.25	06.47	08.05	10.07-10.38/31	08.31 11.06-11.19/13
	23.07	21.46	20.08	18.30	15.59	15.05
13	04.08	05.27	06.49	08.08	10.07-10.39/32	08.34 11.04-11.20/16
	23.05	21.43	20.04	18.27	15.56	15.05
14	04.10	05.30	06.52	08.10	10.06-10.39/33	08.37 11.04-11.22/18
	23.03	21.40	20.01	18.24	15.54	15.04
15	04.12	05.33	06.54	08.13	10.06-10.40/34	08.40 11.03-11.23/20
	23.01	21.37	19.58	18.21	15.51	15.04
16	04.14	05.36	06.57	08.16	10.05-10.40/35	08.43 11.02-11.23/21
	22.59	21.34	19.54	18.17	15.49	15.03
17	04.17	05.38	07.00	08.18	10.05-10.40/35	08.46 11.02-11.24/22
	22.56	21.31	19.51	18.14	15.46	15.03
18	04.19	05.41	07.02	08.21	10.05-10.39/34	08.48 11.02-11.24/22
	22.54	21.28	19.48	18.11	15.44	15.03
19	04.21	05.44	07.05	08.24	10.05-10.39/34	08.51 11.02-11.25/23
	22.52	21.25	19.45	18.08	15.41	15.03
20	04.24	05.46	07.07	08.27	10.05-10.39/34	08.54 11.02-11.25/23
	22.50	21.22	19.41	18.05	15.39	15.04
21	04.26	05.49	07.10	08.29	10.05-10.38/33	08.57 11.03-11.26/23
	22.47	21.19	19.38	18.02	15.37	15.04
22	04.29	05.52	07.12	08.32	10.06-10.37/31	08.59 11.02-11.26/24
	22.45	21.15	19.35	17.59	15.35	15.04
23	04.31	05.54	07.15	08.35	10.06-10.36/30	09.02 11.03-11.27/24
	22.42	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57	07.18	08.38	10.07-10.35/28	09.05 11.03-11.26/23
	22.40	21.09	19.28	17.53	15.30	15.06
25	04.36	06.00	07.20	07.40	09.08-09.34/26	09.07 11.03-11.26/23
	22.37	21.06	19.25	16.50	15.28	15.06
26	04.39	06.02	07.23	07.43	09.10-09.32/22	09.10 11.05-11.27/22
	22.35	21.03	19.22	16.47	15.26	15.07
27	04.42	06.05	07.25	07.46	09.11-09.30/19	09.12 11.05-11.26/21
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.44	06.08	07.28	07.49	09.14-09.27/13	09.15 11.05-11.26/21
	22.30	20.56	19.15	16.41	15.23	15.09
29	04.47	06.10	07.31	07.52	09.19-09.22/3	09.17 11.07-11.26/19
	22.27	20.53	19.12	16.38	15.21	15.10
30	04.50	06.13	07.33	07.54	09.20	11.08-11.26/18
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16		07.57		09.55
	22.21	20.47		16.32		15.13
Potential sun hours	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	633	406	82

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 6 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (694)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.06	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.46
	15.40	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.04
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.49	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 7 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712)
 Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.54	08.59	07.37	06.57	05.21	04.01	04.49-05.05/16	03.47	04.51-05.14/23	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59		23.22		22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	04.47-05.06/19	03.49	04.51-05.14/23	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01		23.21		22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	04.47-05.06/19	03.50	04.52-05.15/23	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03		23.20		22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	04.47-05.07/20	03.51	04.52-05.14/22	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05		23.19		22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	04.47-05.08/21	03.53	04.52-05.14/22	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07		23.17		22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	04.47-05.08/21	03.55	04.53-05.14/21	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09		23.16		22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	04.47-05.09/22	03.56	04.54-05.14/20	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11		23.15		22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	04.47-05.09/22	03.58	04.54-05.14/20	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12		23.13		21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.47-05.09/22	04.00	04.55-05.14/19	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14		23.12		21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.47-05.09/22	04.02	04.55-05.13/18	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15		23.10		21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.46-05.09/23	04.04	04.56-05.13/17	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17		23.08		21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.47-05.10/23	04.06	04.57-05.12/15	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18		23.06		21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.47-05.10/23	04.08	04.59-05.12/13	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19		23.04		21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.47-05.11/24	04.10	05.01-05.11/10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20		23.02		21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.48-05.11/23	04.12	05.03-05.11/8	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21		23.00		21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.47-05.11/24	04.14	05.04-05.08/4	05.36	06.57	08.16	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22		22.58		21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.47-05.11/24	04.17		05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23		22.56		21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.48-05.12/24	04.19		05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24		22.54		21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.48-05.12/24	04.22		05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24		22.52		21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.48-05.12/24	04.24		05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25		22.49		21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.48-05.12/24	04.26		05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25		22.47		21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.49-05.13/24	04.29		05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25		22.45		21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.49-05.13/24	04.31		05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25		22.42		21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.49-05.13/24	04.34		05.57	07.18	08.37	09.05	09.55
	16.09	17.38	18.55	21.18	22.40	23.25		22.40		21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.49-05.13/24	04.36		06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25		22.37		21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.49-05.13/24	04.39		06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25		22.35		21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	04.56-04.57/1	03.44	04.50-05.13/23	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24		22.32		20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	04.55-05.01/6	03.44	04.50-05.14/24	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24		22.29		20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	04.53-05.02/9	03.45	04.51-05.14/23	04.47	06.10	07.31	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23		22.27		20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	04.51-05.03/12	03.46	04.50-05.13/23	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22		22.24		20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03	04.50-05.04/14		04.52		06.15		07.57		09.55
	16.29		20.13		22.57			22.21		20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586		578		495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	42	677		278		0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

29.11.2021 15.33/3.4.388

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 8 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (713)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 9 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (714

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 10 - NORDEX N117/2400 2400 116.8 !OI! hub: 120,0 m (TOT: 178,4 m) (715) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 11 - NORDEX N117/2400 2400 116.8 !OI hub: 120,0 m (TOT: 178,4 m) (716) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 12 - NORDEX N117/2400 2400 116.8 !OI! hub: 120,0 m (TOT: 178,4 m) (717

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55 15.15	08.59 16.32	07.37 17.52	06.57 20.16	05.21 21.38	04.01 22.59	03.47 23.22	04.55 22.19	06.18 20.43	07.36 19.05	08.00 16.29	09.22 15.17
2	09.54 15.17	08.56 16.34	07.34 17.55	06.53 20.19	05.18 21.41	03.59 23.01	03.49 23.21	04.58 22.16	06.21 20.40	07.38 19.02	08.03 16.26	09.25 15.16
3	09.53 15.18	08.54 16.37	07.31 17.58	06.50 20.21	05.15 21.44	03.57 23.03	03.50 23.20	05.00 22.13	06.23 20.37	07.41 18.59	08.06 16.23	09.27 15.14
4	09.52 15.20	08.51 16.40	07.27 18.00	06.47 20.24	05.12 21.46	03.55 23.05	03.51 23.19	05.03 22.10	06.26 20.34	07.44 18.56	08.09 16.20	09.29 15.13
5	09.51 15.22	08.48 16.43	07.24 18.03	06.44 20.27	05.09 21.49	03.54 23.07	03.53 23.18	05.06 22.07	06.29 20.30	07.46 18.52	08.11 16.17	09.31 15.12
6	09.50 15.24	08.46 16.46	07.21 18.06	06.40 20.29	05.06 21.52	03.52 23.09	03.54 23.16	05.08 22.04	06.31 20.27	07.49 18.49	08.14 16.15	09.33 15.10
7	09.49 15.26	08.43 16.49	07.18 18.09	06.37 20.32	05.03 21.55	03.51 23.11	03.56 23.15	05.11 22.01	06.34 20.24	07.51 18.46	08.17 16.12	09.35 15.09
8	09.48 15.28	08.40 16.52	07.15 18.11	06.34 20.35	05.00 21.57	03.49 23.12	03.58 23.13	05.14 21.58	06.36 20.21	07.54 18.43	08.20 16.09	09.37 15.08
9	09.47 15.30	08.37 16.55	07.11 18.14	06.31 20.38	04.57 22.00	03.48 23.14	04.00 23.12	05.16 21.55	06.39 20.17	07.57 18.40	08.23 16.06	09.39 15.07
10	09.45 15.32	08.34 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.15	04.02 23.10	05.19 21.52	06.41 20.14	07.59 18.36	08.26 16.04	09.41 15.06
11	09.44 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17	04.04 23.08	05.22 21.49	06.44 20.11	08.02 18.33	08.29 16.01	09.42 15.06
12	09.42 15.37	08.29 17.04	07.02 18.22	06.21 20.46	04.49 22.09	03.45 23.18	04.06 23.06	05.25 21.46	06.47 20.07	08.05 18.30	08.31 15.59	09.44 15.05
13	09.41 15.39	08.26 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19	04.08 23.05	05.27 21.43	06.49 20.04	08.07 18.27	08.34 15.56	09.46 15.04
14	09.39 15.42	08.23 17.09	06.55 18.28	06.14 20.51	04.43 22.14	03.43 23.20	04.10 23.03	05.30 21.40	06.52 20.01	08.10 18.24	08.37 15.53	09.47 15.04
15	09.37 15.44	08.20 17.12	06.52 18.30	06.11 20.54	04.41 22.17	03.42 23.21	04.12 23.01	05.33 21.37	06.54 19.58	08.13 18.21	08.40 15.51	09.48 15.04
16	09.36 15.47	08.17 17.15	06.49 18.33	06.08 20.57	04.38 22.19	03.42 23.22	04.14 22.59	05.35 21.34	06.57 19.54	08.16 18.17	08.43 15.48	09.50 15.03
17	09.34 15.49	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.41 23.23	04.17 22.56	05.38 21.31	07.00 19.51	08.18 18.14	08.46 15.46	09.51 15.03
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24	04.19 22.54	05.41 21.28	07.02 19.48	08.21 18.11	08.48 15.44	09.52 15.03
19	09.30 15.55	08.08 17.24	06.39 18.41	05.58 21.05	04.30 22.27	03.41 23.24	04.21 22.52	05.44 21.25	07.05 19.45	08.24 18.08	08.51 15.41	09.53 15.03
20	09.28 15.57	08.05 17.27	06.36 18.44	05.55 21.07	04.27 22.30	03.41 23.25	04.24 22.50	05.46 21.22	07.07 19.41	08.26 18.05	08.54 15.39	09.53 15.04
21	09.26 16.00	08.02 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25	04.26 22.47	05.49 21.18	07.10 19.38	08.29 18.02	08.57 15.37	09.54 15.04
22	09.23 16.03	07.59 17.32	06.29 18.49	05.49 21.13	04.22 22.35	03.41 23.25	04.29 22.45	05.52 21.15	07.12 19.35	08.32 17.59	08.59 15.35	09.55 15.04
23	09.21 16.06	07.56 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25	04.31 22.42	05.54 21.12	07.15 19.31	08.35 17.56	09.02 15.32	09.55 15.05
24	09.19 16.08	07.53 17.38	06.23 18.55	05.43 21.18	04.18 22.40	03.42 23.25	04.34 22.40	05.57 21.09	07.18 19.28	08.38 17.53	09.05 15.30	09.56 15.05
25	09.17 16.11	07.49 17.41	06.19 18.57	05.40 21.21	04.15 22.43	03.42 23.25	04.36 22.37	06.00 21.06	07.20 19.25	07.40 16.50	09.07 15.28	09.56 15.06
26	09.14 16.14	07.46 17.44	06.16 19.00	05.36 21.24	04.13 22.45	03.43 23.25	04.39 22.35	06.02 21.03	07.23 19.22	07.43 16.47	09.10 15.26	09.56 15.07
27	09.12 16.17	07.43 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.24	04.42 22.32	06.05 20.59	07.25 19.18	07.46 16.44	09.12 15.24	09.56 15.08
28	09.09 16.20	07.40 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24	04.44 22.29	06.08 20.56	07.28 19.15	07.49 16.41	09.15 15.23	09.56 15.09
29	09.07 16.23	07.37 17.52	06.06 19.08	05.27 21.32	04.06 22.52	03.45 23.23	04.47 22.27	06.10 20.53	07.31 19.12	07.52 16.38	09.17 15.21	09.56 15.10
30	09.04 16.26	07.34 17.55	06.03 19.11	05.24 21.35	04.04 22.55	03.46 23.23	04.49 22.24	06.13 20.50	07.33 19.09	07.54 16.35	09.20 15.19	09.56 15.12
31	09.02 16.29	07.31 17.58	06.00 19.14	05.21 21.38	04.01 22.59	03.47 23.22	04.55 22.19	06.18 20.43	07.36 19.05	08.00 16.29	09.22 15.17	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 13 - NORDEX N117/2400 2400 116.8 !OI hub: 120,0 m (TOT: 178,4 m) (718)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 14 - NORDEX N117/2400 2400 116.8 !OI! hub: 120,0 m (TOT: 178,4 m) (719) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 15 - NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720) Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.26-08.48/22	08.00	09.22	
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05		16.29	15.17	
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.26-08.48/22	08.03	09.25	
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02		16.26	15.16	
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.25-08.47/22	08.06	09.27	
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59		16.23	15.14	
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.25-08.46/21	08.09	09.29	
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56		16.20	15.13	
5	09.52	08.48	07.24	07.55-08.04/9	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.26-08.46/20	08.12	09.31
	15.22	16.43	18.03		20.27	21.49	23.07	23.18	22.07	20.30		16.18	15.12	
6	09.50	08.46	07.21	07.52-08.06/14	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.26-08.44/18	08.14	09.33
	15.24	16.46	18.06		20.29	21.52	23.09	23.16	22.04	20.27		16.15	15.10	
7	09.49	08.43	07.18	07.51-08.08/17	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.27-08.43/16	08.17	09.35
	15.26	16.49	18.09		20.32	21.55	23.11	23.15	22.01	20.24		16.12	15.09	
8	09.48	08.40	07.15	07.49-08.08/19	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.29-08.41/12	08.20	09.37
	15.28	16.52	18.12		20.35	21.58	23.12	23.13	21.58	20.21		16.09	15.08	
9	09.47	08.37	07.11	07.48-08.09/21	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.32-08.37/5	08.23	09.39
	15.30	16.55	18.14		20.38	22.00	23.14	23.12	21.55	20.17		16.07	15.07	
10	09.45	08.34	07.08	07.48-08.09/21	06.27	04.55	03.47	04.02	05.19	06.42	07.59		08.26	09.41
	15.32	16.58	18.17		20.40	22.03	23.16	23.10	21.52	20.14		16.04	15.06	
11	09.44	08.32	07.05	07.47-08.08/21	06.24	04.52	03.46	04.04	05.22	06.44	08.02		08.29	09.43
	15.35	17.01	18.20		20.43	22.06	23.17	23.08	21.49	20.11		16.01	15.06	
12	09.43	08.29	07.02	07.47-08.08/21	06.21	04.49	03.45	04.06	05.25	06.47	08.05		08.31	09.44
	15.37	17.04	18.22		20.46	22.09	23.18	23.07	21.46	20.08		15.59	15.05	
13	09.41	08.26	06.59	07.47-08.08/21	06.18	04.46	03.44	04.08	05.27	06.49	08.08		08.34	09.46
	15.39	17.07	18.25		20.48	22.11	23.19	23.05	21.43	20.04		15.56	15.04	
14	09.39	08.23	06.55	07.47-08.07/20	06.14	04.43	03.43	04.10	05.30	06.52	08.10		08.37	09.47
	15.42	17.10	18.28		20.51	22.14	23.21	23.03	21.40	20.01		15.53	15.04	
15	09.37	08.20	06.52	07.48-08.06/18	06.11	04.41	03.42	04.12	05.33	06.54	08.13		08.40	09.48
	15.44	17.12	18.31		20.54	22.17	23.22	23.01	21.37	19.58		15.51	15.04	
16	09.36	08.17	06.49	07.49-08.04/15	06.08	04.38	03.42	04.14	05.35	06.57	08.16		08.43	09.50
	15.47	17.15	18.33		20.57	22.20	23.22	22.59	21.34	19.54		15.48	15.03	
17	09.34	08.14	06.46	07.50-08.01/11	06.05	04.35	03.41	04.17	05.38	07.00	08.18		08.46	09.51
	15.49	17.18	18.36		20.59	22.22	23.23	22.56	21.31	19.51		15.46	15.03	
18	09.32	08.11	06.42		06.02	04.33	03.41	04.19	05.41	07.02	08.21		08.48	09.52
	15.52	17.21	18.39		21.02	22.25	23.24	22.54	21.28	19.48		15.44	15.03	
19	09.30	08.08	06.39		05.58	04.30	03.41	04.21	05.44	07.05	08.24		08.51	09.53
	15.55	17.24	18.41		21.05	22.28	23.24	22.52	21.25	19.45		15.41	15.03	
20	09.28	08.05	06.36		05.55	04.27	03.41	04.24	05.46	07.07	08.27		08.54	09.54
	15.57	17.27	18.44		21.08	22.30	23.25	22.50	21.22	19.41		15.39	15.04	
21	09.26	08.02	06.33		05.52	04.25	03.41	04.26	05.49	07.10	08.29		08.57	09.54
	16.00	17.30	18.47		21.10	22.33	23.25	22.47	21.19	19.38		15.37	15.04	
22	09.23	07.59	06.29		05.49	04.22	03.41	04.29	05.52	07.12	08.32		08.59	09.55
	16.03	17.33	18.49		21.13	22.35	23.25	22.45	21.15	19.35		15.35	15.04	
23	09.21	07.56	06.26		05.46	04.20	03.41	04.31	05.54	07.15	08.35		09.02	09.55
	16.06	17.35	18.52		21.16	22.38	23.25	22.42	21.12	19.32		15.32	15.05	
24	09.19	07.53	06.23		05.43	04.18	03.42	04.34	05.57	07.18	08.38		09.05	09.56
	16.09	17.38	18.55		21.19	22.40	23.25	22.40	21.09	19.28		15.30	15.05	
25	09.17	07.49	06.20		05.40	04.15	03.42	04.36	06.00	07.20	07.40		09.07	09.56
	16.11	17.41	18.57		21.21	22.43	23.25	22.37	21.06	19.25		15.28	15.06	
26	09.14	07.46	06.16		05.36	04.13	03.43	04.39	06.02	07.23	08.34-08.43/9		09.10	09.56
	16.14	17.44	19.00		21.24	22.45	23.25	22.35	21.03	19.22		15.26	15.07	
27	09.12	07.43	06.13		05.33	04.11	03.43	04.42	06.05	07.25	08.31-08.45/14		09.12	09.56
	16.17	17.47	19.03		21.27	22.48	23.25	22.32	20.59	19.18		15.24	15.08	
28	09.09	07.40	06.10		05.30	04.09	03.44	04.44	06.08	07.28	08.29-08.46/17		09.15	09.56
	16.20	17.49	19.05		21.30	22.50	23.24	22.30	20.56	19.15		15.23	15.09	
29	09.07		07.06		05.27	04.07	03.45	04.47	06.10	07.31	08.29-08.47/18		09.17	09.56
	16.23		20.08		21.32	22.53	23.23	22.27	20.53	19.12		15.21	15.10	
30	09.04		07.03		05.24	04.04	03.46	04.50	06.13	07.33	08.27-08.47/20		09.20	09.56
	16.26		20.11		21.35	22.55	23.23	22.24	20.50	19.09		15.19	15.12	
31	09.02		07.00			04.02		04.52	06.15				09.55	
	16.29		20.13			22.57		22.21	20.47				15.13	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166		
Sum of minutes with flicker	0	0	228	0	0	0	0	0	78	158	0	0		

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 16 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.16	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.58	03.51	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.28
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.54	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.59	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.10	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.38
	15.31	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.48	04.02	05.20	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.37	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.06
13	09.40	08.25	06.58	06.18	04.46	03.45	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.11	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.16	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.51
	15.53	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.56	04.28	03.42	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.42	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.21	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.15	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.50	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.31	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.14
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 17 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.39	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.01	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129**WTG:** 18 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 19 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.49	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 20 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.22	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.39	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 21 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129WTG: 22 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 23 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.26
	15.19	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129 **WTG:** 24 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.56	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.31	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.26	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.30	04.57	03.48	04.00	05.16	06.39	07.57	08.22	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.39	16.06	15.07
10	09.45	08.34	07.08	06.27	04.54	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.19	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.21	05.43	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.03
20	09.27	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.57	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.22	03.41	04.29	05.51	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.08	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.39	04.15	03.42	04.36	05.59	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.21	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.46	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.07	07.28	07.48	09.14	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.08	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

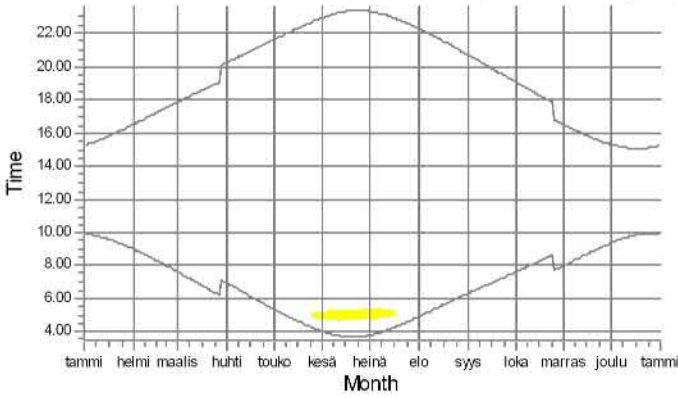
Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

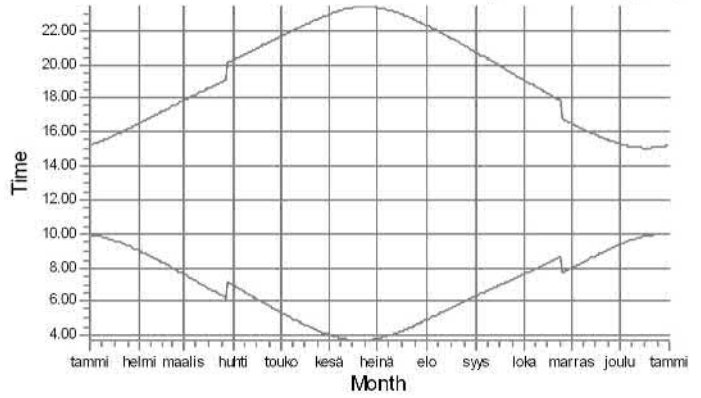
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

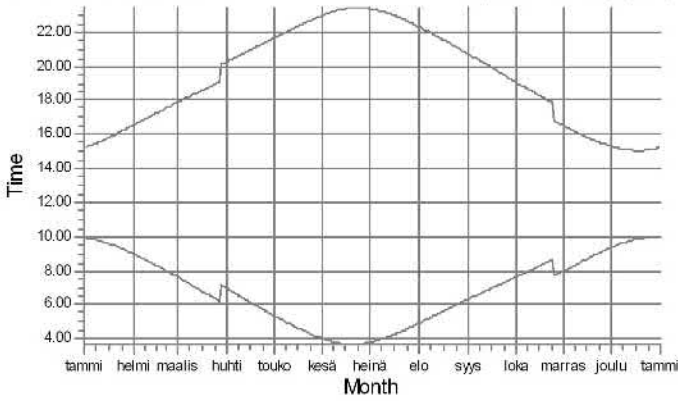
7: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (712)



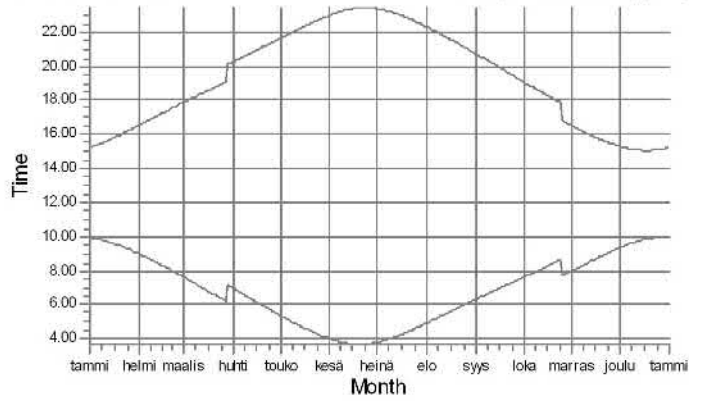
8: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (713)



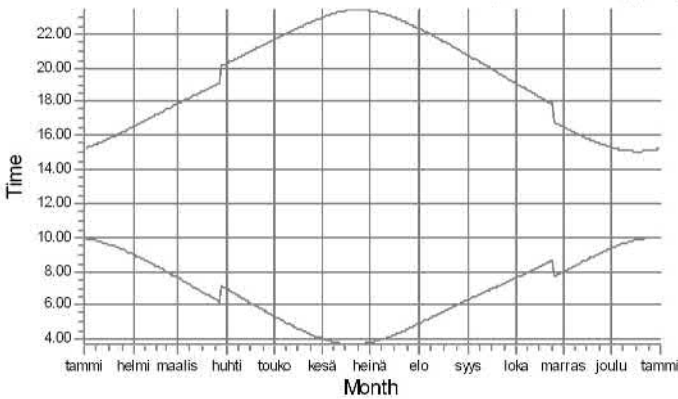
9: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (714)



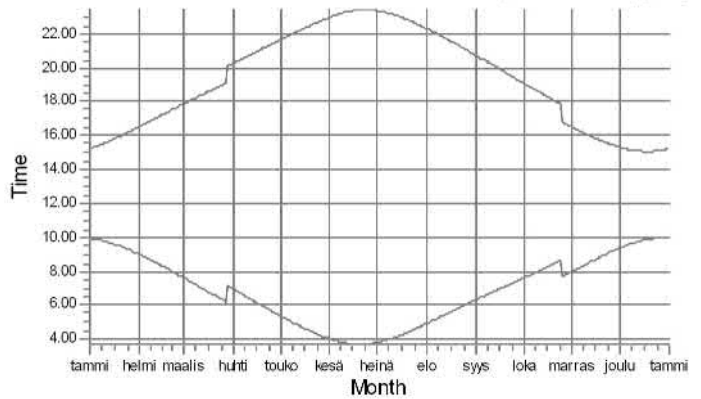
10: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (715)



11: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (716)



12: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (717)



Shadow receptors

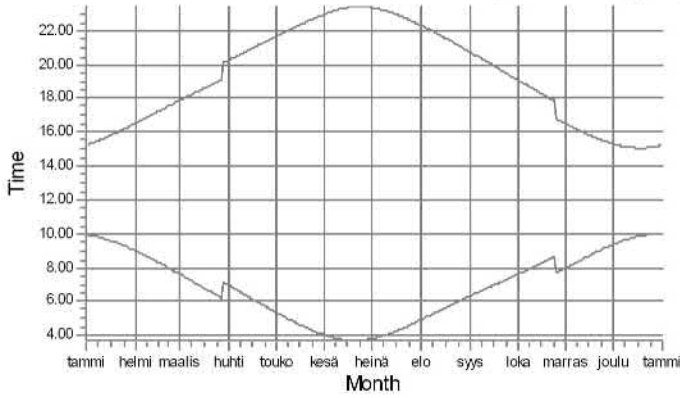


B: Asuinrakennus B, ~Ristoläntie 459

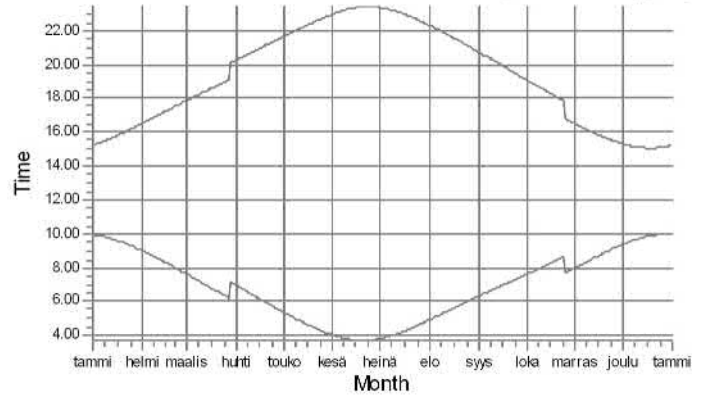
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

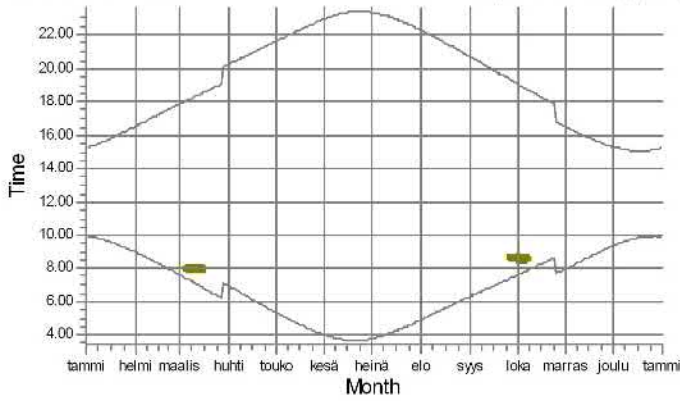
13: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (718



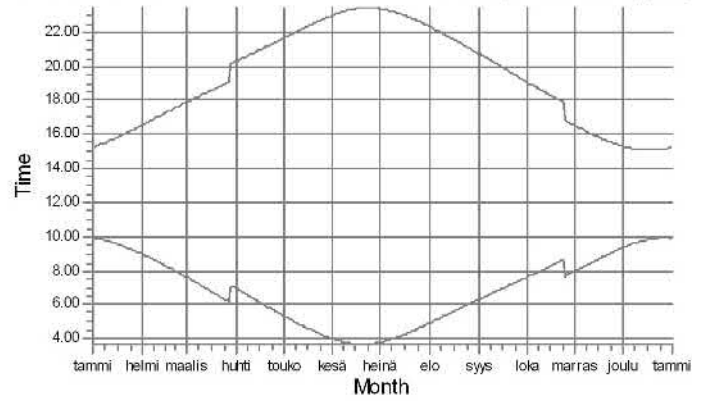
14: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (719



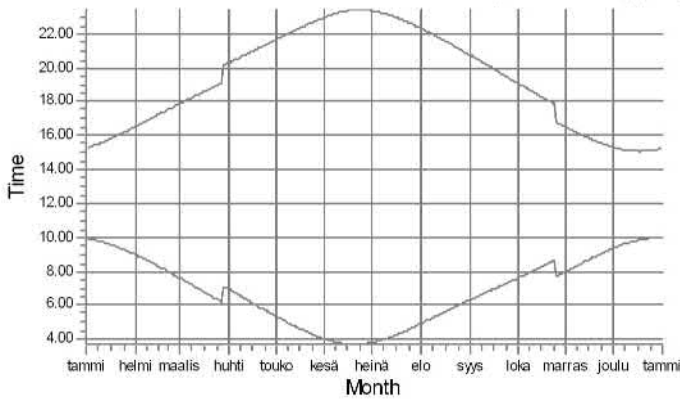
15: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (720



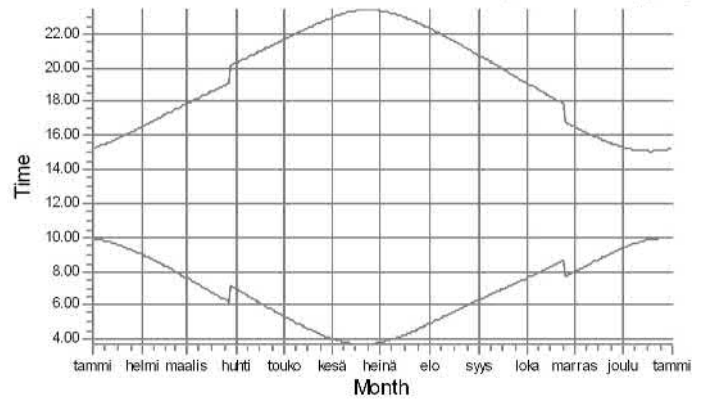
16: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (721



17: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (722



18: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (723



Shadow receptors

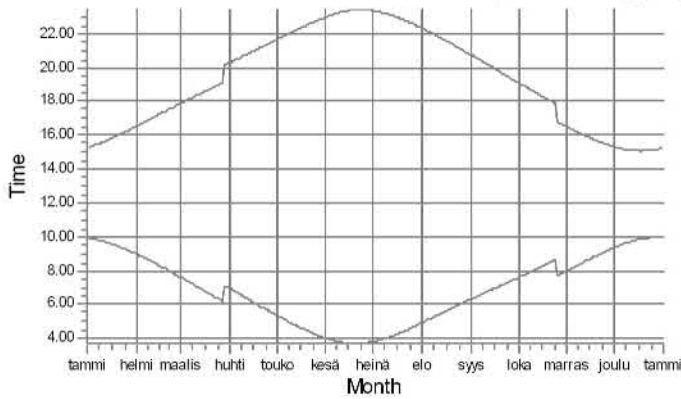


J: Asuinrakennus J, ~Penkkinevantie 85

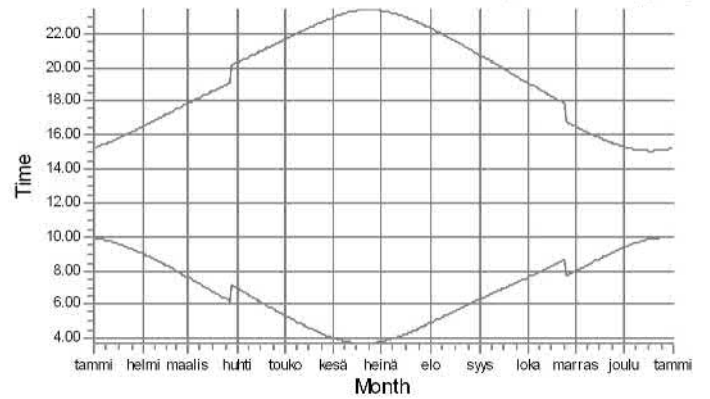
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129

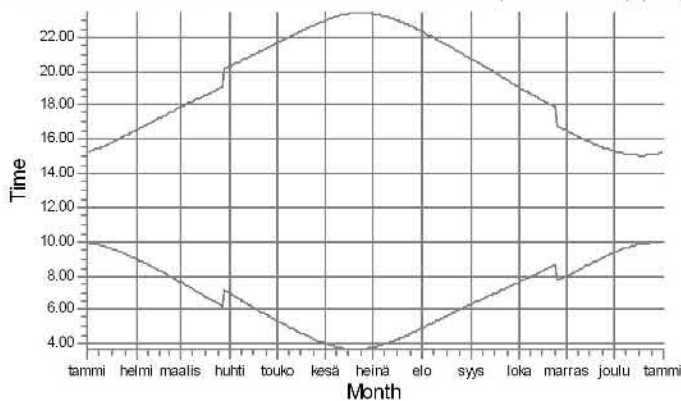
19: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (724



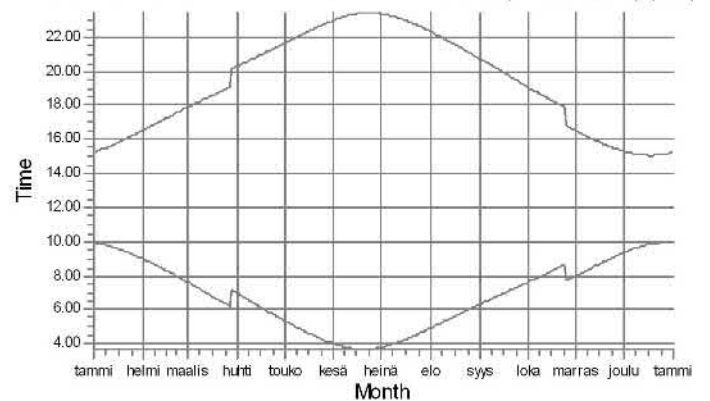
20: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (725



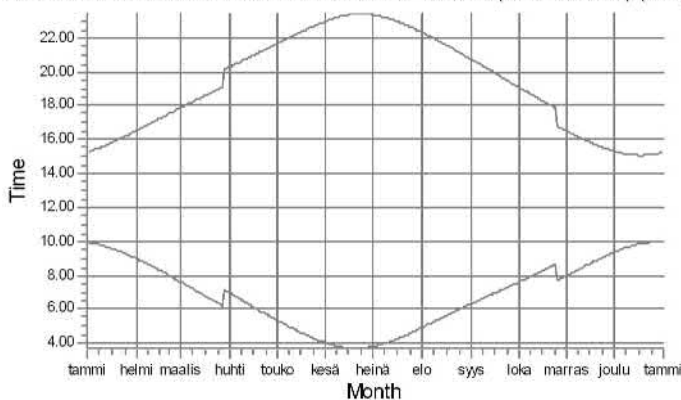
21: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (726



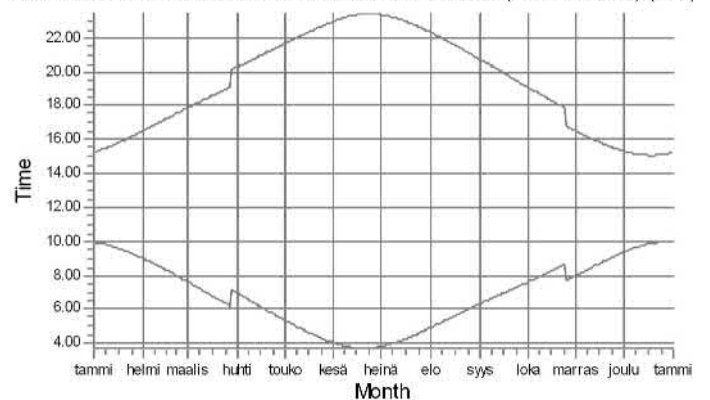
22: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (727



23: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (728



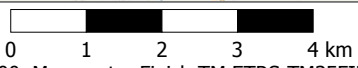
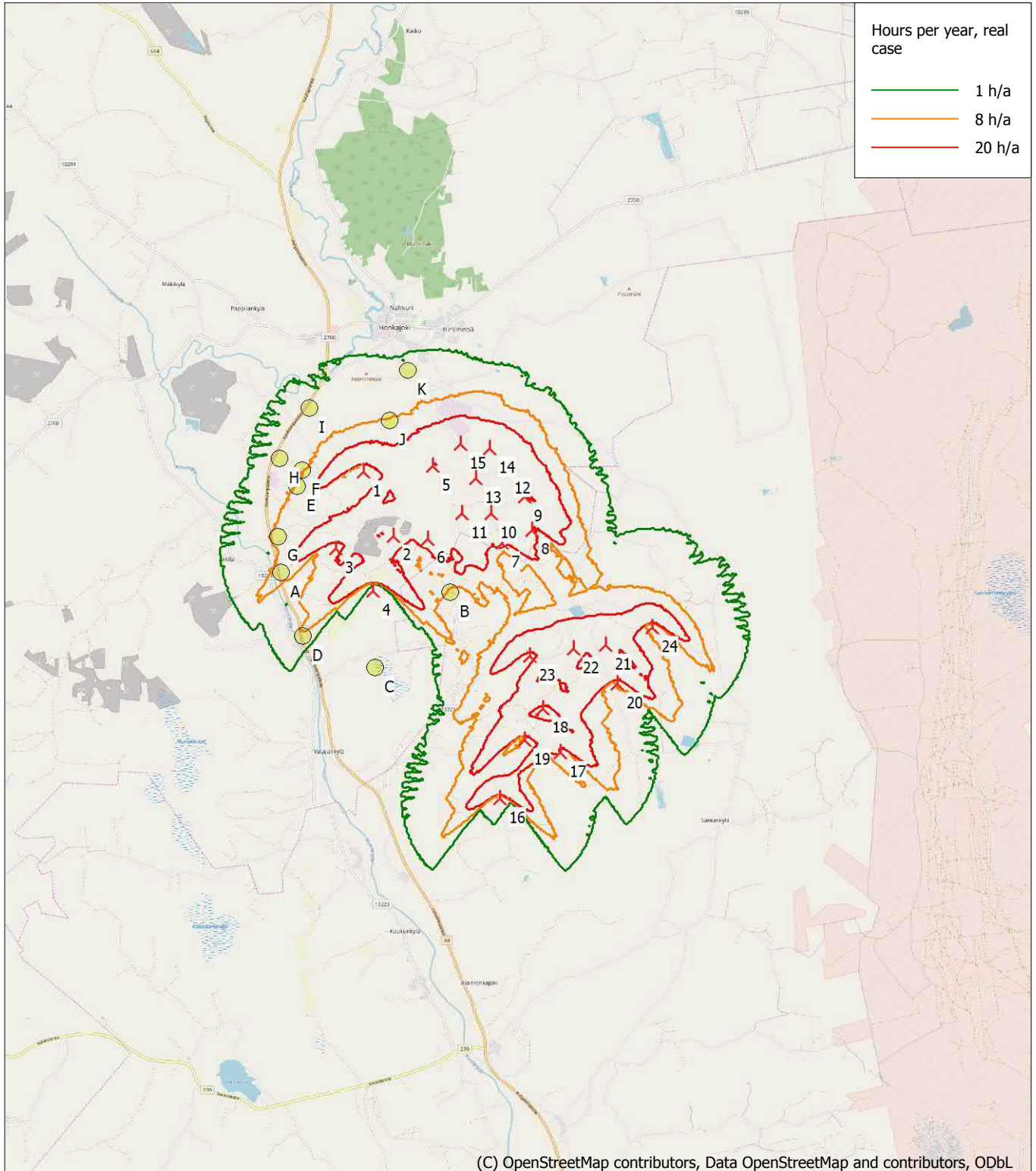
24: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (729



Shadow receptors

SHADOW - Map

Calculation: Paholammi_VE1_Shadow_No_Forest_20211129



Map: EMD OpenStreetMap , Print scale 1:100 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 620 North: 6 877 590
 New WTG Shadow receptor
 Flicker map level: Height Contours: CONTOURLINE_EP_Tuulivoimaselvitys_0.wpo (4)

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy
 Osmontie 34, PO Box 950
 FI-00601 Helsinki
 +358104095666
 Johanna Harju / johanna.harju@fcg.fi
 Calculated:
 29.11.2021 15.51/3.4.388

SHADOW - Main Result

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129

Assumptions for shadow calculations

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

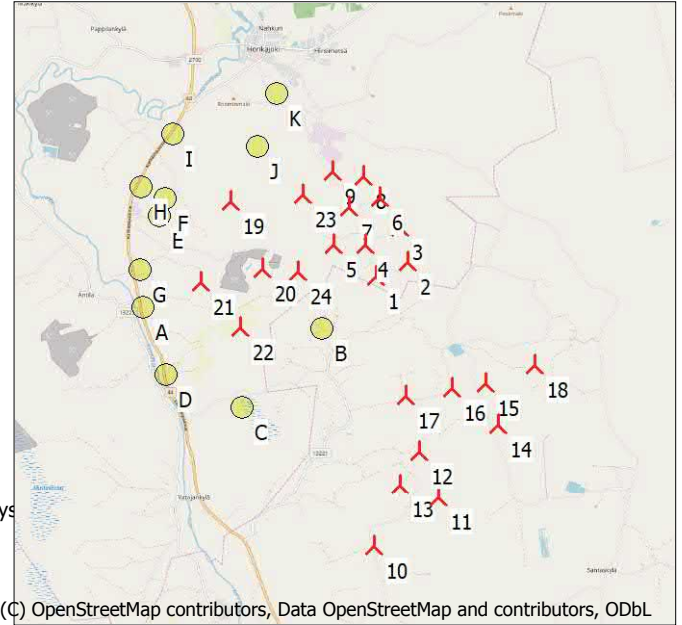
Minimum sun height over horizon for influence 3 °
 Day step for calculation 1 days
 Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) []
 Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time
 N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

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: CONTOURLINE_EP_Tuulivoimaselvitys
 Obstacles used in calculation
 Eye height for map: 1,5 m
 Grid resolution: 1,0 m

All coordinates are in
 Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:125 000
 New WTG Shadow receptor

WTGs

	East	North	Z	Row data/Description	WTG type			Shadow data				
					Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Calculation distance [m]	RPM [RPM]
1	253 616	6 878 546	105,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
2	254 154	6 878 757	112,2	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
3	254 073	6 879 329	112,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
4	253 487	6 879 084	110,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
5	252 957	6 879 121	107,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
6	253 775	6 879 840	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
7	253 252	6 879 721	117,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
8	253 525	6 880 225	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
9	253 026	6 880 328	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
10	253 256	6 874 086	105,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
11	254 378	6 874 820	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
12	254 139	6 875 605	109,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
13	253 765	6 875 082	105,6	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
14	255 464	6 875 947	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
15	255 305	6 876 650	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
16	254 745	6 876 621	107,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
17	253 975	6 876 541	107,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
18	256 142	6 876 896	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
19	251 304	6 879 975	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
20	251 747	6 878 810	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
21	250 727	6 878 659	100,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
22	251 315	6 877 881	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
23	252 523	6 879 987	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
24	252 334	6 878 721	102,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation	Slope of	Direction mode	Eye height
				[m]	[m]	[m]	a.g.l. [m]	window [°]		(ZVI) a.g.l. [m]
A	Asuinrakennus A, ~Kankaanpääntie 534	249 740	6 878 307	92,4	5,0	5,0	1,0	90,0	"Green house mode"	6,0
B	Asuinrakennus B, ~Ristiläntie 459	252 656	6 877 758	100,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
C	Lomarakennus C, ~Variksentie 93	251 251	6 876 536	93,2	5,0	5,0	1,0	90,0	"Green house mode"	6,0
D	Asuinrakennus D, ~Kankaanpääntie 646	250 034	6 877 181	87,7	5,0	5,0	1,0	90,0	"Green house mode"	6,0

To be continued on next page...

SHADOW - Main Result

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129

...continued from previous page

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
E	Asuinrakennus E, ~Välisalongtie 130	250 125	6 879 799	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
F	Asuinrakennus F, ~Välisalongtie 101	250 226	6 880 083	97,6	5,0	5,0	1,0	90,0	"Green house mode"	6,0
G	Asuinrakennus G, ~Kankaanpääntie 468	249 740	6 878 942	94,8	5,0	5,0	1,0	90,0	"Green house mode"	6,0
H	Lomarakennus H, ~Kankaanpääntie 320	249 856	6 880 304	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
I	Asuinrakennus I, ~Kankaanpääntie 218	250 438	6 881 151	96,3	5,0	5,0	1,0	90,0	"Green house mode"	6,0
J	Asuinrakennus J, ~Penkkinevantie 85	251 819	6 880 838	102,5	5,0	5,0	1,0	90,0	"Green house mode"	6,0
K	Asuinrakennus K, ~Seppäkoskentie 36	252 204	6 881 690	105,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values	
		Shadow hours per year [h/year]	
A	Asuinrakennus A, ~Kankaanpääntie 534	14:41	
B	Asuinrakennus B, ~Ristiläntie 459	9:45	
C	Lomarakennus C, ~Variksentie 93	0:00	
D	Asuinrakennus D, ~Kankaanpääntie 646	8:38	
E	Asuinrakennus E, ~Välisalongtie 130	8:53	
F	Asuinrakennus F, ~Välisalongtie 101	7:59	
G	Asuinrakennus G, ~Kankaanpääntie 468	12:49	
H	Lomarakennus H, ~Kankaanpääntie 320	3:21	
I	Asuinrakennus I, ~Kankaanpääntie 218	2:06	
J	Asuinrakennus J, ~Penkkinevantie 85	10:25	
K	Asuinrakennus K, ~Seppäkoskentie 36	3:07	

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712)	16:37	4:19
2	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)	0:00	0:00
3	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714)	0:00	0:00
4	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)	0:00	0:00
5	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716)	0:00	0:00
6	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717)	0:00	0:00
7	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)	0:00	0:00
8	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719)	0:00	0:00
9	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)	7:44	1:19
10	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)	0:00	0:00
11	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)	0:00	0:00
12	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)	0:00	0:00
13	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)	0:00	0:00
14	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)	0:00	0:00
15	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)	0:00	0:00
16	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)	0:00	0:00
17	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)	0:00	0:00
18	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)	0:00	0:00
19	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (730)	134:18	25:18
20	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731)	44:27	7:00
21	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)	116:05	22:19
22	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)	62:45	14:36
23	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (734)	46:22	5:23
24	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (735)	0:00	0:00

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.

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 16.32	07.37 17.52	06.57 20.16	05.21 21.38	06.14 (21) 04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 17.55	06.54 20.19	05.18 21.41	06.11 (21) 03.59 23.01
3	09.53 15.19	08.54 16.38	07.31 17.58	06.50 20.22	05.15 21.44	06.08 (21) 03.57 23.03
4	09.52 15.20	08.51 16.41	07.28 18.01	06.47 20.24	05.12 21.47	06.07 (21) 03.56 23.05
5	09.52 15.22	08.49 16.44	07.24 18.04	06.44 20.27	05.09 21.49	06.05 (21) 03.54 23.07
6	09.50 15.24	08.46 16.47	07.21 18.06	06.41 20.30	05.07 21.52	06.04 (21) 03.53 23.09
7	09.49 15.26	08.43 16.49	07.18 18.09	06.37 20.32	05.04 21.55	06.03 (21) 03.51 23.11
8	09.48 15.28	08.40 16.52	07.15 18.12	06.34 20.35	05.01 21.58	06.02 (21) 03.50 23.12
9	09.47 15.31	08.37 16.55	07.12 18.15	06.31 20.38	04.58 22.00	06.02 (21) 03.48 23.14
10	09.46 15.33	08.35 16.58	07.08 18.17	06.28 20.40	04.55 22.03	06.01 (21) 03.47 23.15
11	09.44 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	06.01 (21) 03.46 23.17
12	09.43 15.37	08.29 17.04	07.02 18.23	06.21 20.46	04.49 22.09	06.00 (21) 03.45 23.18
13	09.41 15.40	08.26 17.07	06.59 18.25	06.18 20.49	04.46 22.11	06.00 (21) 03.44 23.19
14	09.39 15.42	08.23 17.10	06.56 18.28	06.15 20.51	04.44 22.14	06.00 (21) 03.44 23.20
15	09.38 15.45	08.20 17.13	06.52 18.31	06.12 20.54	04.41 22.17	05.59 (21) 03.43 23.21
16	09.36 15.47	08.17 17.16	06.49 18.33	06.08 20.57	04.38 22.20	05.59 (21) 03.42 23.22
17	09.34 15.50	08.14 17.19	06.46 18.36	06.05 20.59	04.36 22.22	06.00 (21) 03.42 23.23
18	09.32 15.53	08.11 17.21	06.43 18.39	06.02 21.02	04.33 22.25	06.00 (21) 03.42 23.24
19	09.30 15.55	08.08 17.24	06.39 18.42	05.59 21.05	04.30 22.28	06.00 (21) 03.41 23.24
20	09.28 15.58	08.05 17.27	06.36 18.44	05.56 21.08	04.28 22.30	06.00 (21) 03.41 23.25
21	09.26 16.01	08.02 17.30	06.33 18.47	05.52 21.10	04.25 22.33	05.59 (21) 03.41 23.25
22	09.24 16.03	07.59 17.33	06.30 18.50	05.49 21.13	04.23 22.35	06.01 (21) 03.41 23.25
23	09.21 16.06	07.56 17.36	06.26 18.52	05.46 21.16	04.20 22.38	06.01 (21) 03.42 23.25
24	09.19 16.09	07.53 17.38	06.23 18.55	05.43 21.19	04.18 22.40	06.01 (21) 03.42 23.25
25	09.17 16.12	07.50 17.41	06.20 18.58	05.40 21.21	04.16 22.43	06.01 (21) 03.43 23.25
26	09.14 16.15	07.47 17.44	06.17 19.00	05.37 21.24	04.13 22.45	06.01 (21) 03.43 23.25
27	09.12 16.17	07.43 17.47	06.13 19.03	05.34 21.27	04.11 22.48	06.02 (21) 03.44 23.25
28	09.09 16.20	07.40 17.50	06.10 19.06	05.31 21.30	04.09 22.50	06.03 (21) 03.45 23.24
29	09.07 16.23		07.07 20.08	05.28 21.33	04.07 22.53	06.03 (21) 03.46 23.23
30	09.04 16.26		07.03 20.11	05.25 21.35	04.05 22.55	06.04 (21) 03.47 23.23
31	09.02 16.29		07.00 20.14		04.03 22.57	06.04 (21) 03.47 06.35 (21)
Potential sun hours	194	247	364	443	547	586
Total, worst case			269		1031	611
Sun reduction			0,36		0,50	0,47
Oper. time red.			0,88		0,88	0,88
Wind dir. red.			0,60		0,62	0,62
Total reduction			0,19		0,27	0,26
Total, real			51		281	156

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	06.15 (21) 04.55	06.11 (21) 06.18	07.36	08.00	09.22
	23.22	21 06.36 (21) 22.19	37 06.48 (21) 20.44	19.06	16.29	15.18
2	03.49	06.15 (21) 04.58	06.11 (21) 06.21	07.39	08.03	09.25
	23.21	22 06.37 (21) 22.16	36 06.47 (21) 20.40	19.02	16.26	15.16
3	03.50	06.15 (21) 05.01	06.11 (21) 06.24	07.41	08.06	09.27
	23.20	23 06.38 (21) 22.13	35 06.46 (21) 20.37	18.59	16.24	15.15
4	03.52	06.14 (21) 05.03	06.12 (21) 06.26	07.44	08.09	09.29
	23.19	24 06.38 (21) 22.10	34 06.46 (21) 20.34	18.56	16.21	15.13
5	03.53	06.14 (21) 05.06	06.13 (21) 06.29	07.46	08.12	09.31
	23.18	25 06.39 (21) 22.07	32 06.45 (21) 20.31	18.53	16.18	15.12
6	03.55	06.13 (21) 05.09	06.13 (21) 06.31	07.49	08.14	09.33
	23.16	26 06.39 (21) 22.04	31 06.44 (21) 20.27	18.50	16.15	15.11
7	03.57	06.14 (21) 05.11	06.14 (21) 06.34	07.52	08.17	09.35
	23.15	26 06.40 (21) 22.01	29 06.43 (21) 20.24	18.46	16.12	15.10
8	03.58	06.13 (21) 05.14	06.15 (21) 06.37	07.54	08.20	09.37
	23.13	28 06.41 (21) 21.59	27 06.42 (21) 20.21	18.43	16.10	15.09
9	04.00	06.13 (21) 05.17	06.17 (21) 06.39	07.57	08.23	09.39
	23.12	29 06.42 (21) 21.56	24 06.41 (21) 20.18	18.40	16.07	15.08
10	04.02	06.12 (21) 05.20	06.18 (21) 06.42	08.00	08.26	09.41
	23.10	30 06.42 (21) 21.53	21 06.39 (21) 20.14	18.37	16.04	15.07
11	04.04	06.13 (21) 05.22	06.20 (21) 06.44	08.02	08.29	09.43
	23.08	30 06.43 (21) 21.50	16 06.36 (21) 20.11	18.34	16.02	15.06
12	04.06	06.13 (21) 05.25	06.24 (21) 06.47	08.05	08.32	09.44
	23.07	31 06.44 (21) 21.47	9 06.33 (21) 20.08	18.30	15.59	15.05
13	04.08	06.12 (21) 05.28	06.50	08.08	08.34	09.46
	23.05	32 06.44 (21) 21.44	20.04	18.27	15.56	15.05
14	04.10	06.12 (21) 05.30	06.52	08.10	08.37	09.47
	23.03	33 06.45 (21) 21.40	20.01	18.24	15.54	15.04
15	04.13	06.12 (21) 05.33	06.55	08.11 (22) 08.13	08.40	09.48
	23.01	33 06.45 (21) 21.37	19.58	10 08.21 (22) 18.21	15.51	15.04
16	04.15	06.12 (21) 05.36	06.57	08.08 (22) 08.16	08.43	09.50
	22.59	34 06.46 (21) 21.34	19.55	15 08.23 (22) 18.18	15.49	15.04
17	04.17	06.12 (21) 05.39	07.00	08.07 (22) 08.19	08.46	09.51
	22.56	35 06.47 (21) 21.31	19.51	18 08.25 (22) 18.15	15.46	15.04
18	04.19	06.10 (21) 05.41	07.02	08.05 (22) 08.21	08.48	09.52
	22.54	36 06.46 (21) 21.28	19.48	20 08.25 (22) 18.11	15.44	15.04
19	04.22	06.10 (21) 05.44	07.05	08.04 (22) 08.24	08.51	09.53
	22.52	37 06.47 (21) 21.25	19.45	22 08.26 (22) 18.08	15.42	15.04
20	04.24	06.10 (21) 05.47	07.08	08.03 (22) 08.27	08.54	09.54
	22.50	37 06.47 (21) 21.22	19.42	22 08.25 (22) 18.05	15.39	15.04
21	04.27	06.10 (21) 05.49	07.10	08.02 (22) 08.29	08.57	09.54
	22.47	37 06.47 (21) 21.19	19.38	24 08.26 (22) 18.02	15.37	15.04
22	04.29	06.11 (21) 05.52	07.13	08.01 (22) 08.32	08.59	09.55
	22.45	37 06.48 (21) 21.16	19.35	24 08.25 (22) 17.59	15.35	15.05
23	04.32	06.10 (21) 05.55	07.15	08.02 (22) 08.35	09.02	09.55
	22.42	38 06.48 (21) 21.12	19.32	23 08.25 (22) 17.56	15.33	15.05
24	04.34	06.10 (21) 05.57	07.18	08.02 (22) 08.38	09.05	09.56
	22.40	39 06.49 (21) 21.09	19.29	22 08.24 (22) 17.53	15.31	15.06
25	04.37	06.10 (21) 06.00	07.20	08.02 (22) 07.41	09.07	09.56
	22.37	38 06.48 (21) 21.06	19.25	21 08.23 (22) 16.50	15.29	15.07
26	04.39	06.10 (21) 06.03	07.23	08.03 (22) 07.43	09.10	09.56
	22.35	38 06.48 (21) 21.03	19.22	19 08.22 (22) 16.47	15.27	15.08
27	04.42	06.10 (21) 06.05	07.26	08.03 (22) 07.46	09.13	09.56
	22.32	38 06.48 (21) 21.00	19.19	17 08.20 (22) 16.44	15.25	15.09
28	04.45	06.10 (21) 06.08	07.28	08.05 (22) 07.49	09.15	09.56
	22.30	39 06.49 (21) 20.56	19.15	13 08.18 (22) 16.41	15.23	15.10
29	04.47	06.10 (21) 06.11	07.31	08.08 (22) 07.52	09.18	09.56
	22.27	38 06.48 (21) 20.53	19.12	7 08.15 (22) 16.38	15.21	15.11
30	04.50	06.10 (21) 06.13	07.33	07.55	09.20	09.56
	22.24	38 06.48 (21) 20.50	19.09	16.35	15.20	15.12
31	04.53	06.10 (21) 06.16		07.57		09.55
	22.21	37 06.47 (21) 20.47		16.32		15.13
Potential sun hours	578	495	390	311	215	167
Total, worst case	1009		277			
Sun reduction	0,48		0,43			
Oper. time red.	0,88		0,88			
Wind dir. red.	0,62		0,62			
Total reduction	0,26		0,23			
Total, real	263		53			

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** B - Asuinrakennus B, ~Ristoläntie 459
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.54	08.59	07.37	06.57	19.14 (22)	04.01
	15.15	16.32	17.52	20.16	21	19.35 (22)
2	09.54	08.56	07.34	06.53	19.13 (22)	05.18
	15.17	16.35	17.55	20.19	23	19.36 (22)
3	09.53	08.54	07.31	06.50	19.12 (22)	05.15
	15.19	16.38	17.58	20.21	25	19.37 (22)
4	09.52	08.51	07.27	06.47	19.11 (22)	05.12
	15.20	16.40	18.01	20.24	27	19.38 (22)
5	09.51	08.48	07.24	06.44	19.09 (22)	05.09
	15.22	16.43	18.03	20.27	28	19.37 (22)
6	09.50	08.46	07.21	06.40	19.09 (22)	05.06
	15.24	16.46	18.06	20.29	28	19.37 (22)
7	09.49	08.43	07.18	06.37	19.09 (22)	05.03
	15.26	16.49	18.09	20.32	28	19.37 (22)
8	09.48	08.40	07.15	06.34	19.09 (22)	05.00
	15.28	16.52	18.12	20.35	28	19.37 (22)
9	09.47	08.37	07.11	06.31	19.09 (22)	04.58
	15.30	16.55	18.14	20.38	28	19.37 (22)
10	09.45	08.34	07.08	06.27	19.09 (22)	04.55
	15.33	16.58	18.17	20.40	27	19.36 (22)
11	09.44	08.32	07.05	06.24	19.09 (22)	04.52
	15.35	17.01	18.20	20.43	26	19.35 (22)
12	09.42	08.29	07.02	06.21	19.09 (22)	04.49
	15.37	17.04	18.22	20.46	24	19.33 (22)
13	09.41	08.26	06.59	06.18	19.10 (22)	04.46
	15.40	17.07	18.25	20.48	22	19.32 (22)
14	09.39	08.23	06.55	06.15	19.11 (22)	04.44
	15.42	17.10	18.28	20.51	20	19.31 (22)
15	09.37	08.20	06.52	06.11	19.13 (22)	04.41
	15.45	17.13	18.31	20.54	16	19.29 (22)
16	09.35	08.17	06.49	06.08	19.15 (22)	04.38
	15.47	17.15	18.33	20.57	11	19.26 (22)
17	09.34	08.14	06.46	06.05	04.35	04.35
	15.50	17.18	18.36	20.59	22.22	22.22
18	09.32	08.11	06.42	06.02	04.33	04.33
	15.52	17.21	18.39	21.02	22.25	22.25
19	09.30	08.08	06.39	05.59	04.30	04.30
	15.55	17.24	18.41	21.05	22.27	22.27
20	09.28	08.05	06.36	05.55	04.28	04.28
	15.58	17.27	18.44	21.07	22.30	22.30
21	09.25	08.02	06.33	05.52	04.25	04.25
	16.00	17.30	18.47	21.10	22.33	22.33
22	09.23	07.59	06.29	05.49	04.23	04.23
	16.03	17.33	18.49	21.13	22.35	22.35
23	09.21	07.56	06.26	05.46	04.20	04.20
	16.06	17.35	18.52	21.16	22.38	22.38
24	09.19	07.53	06.23	05.43	04.18	04.18
	16.09	17.38	18.55	21.18	22.40	22.40
25	09.16	07.49	06.20	05.40	04.16	04.16
	16.12	17.41	18.57	21.21	22.43	22.43
26	09.14	07.46	06.16	05.37	04.13	04.13
	16.14	17.44	19.00	21.24	22.45	22.45
27	09.12	07.43	06.13	05.34	04.11	04.11
	16.17	17.47	19.03	21.27	22.48	22.48
28	09.09	07.40	06.10	05.30	04.09	04.09
	16.20	17.49	19.05	21.30	22.50	22.50
29	09.07		07.07	19.23 (22)	05.27	04.07
	16.23		20.08	5 19.28 (22)	21.32	22.52
30	09.04		07.03	19.19 (22)	05.24	04.05
	16.26		20.11	13 19.32 (22)	21.35	22.55
31	09.02		07.00	19.17 (22)	04.03	04.03
	16.29		20.13	18 19.35 (22)	21.37	22.57
Potential sun hours	194	247	364	443	547	586
Total, worst case			36	382	42	1135
Sun reduction			0,36	0,45	0,50	0,47
Oper. time red.			0,88	0,88	0,88	0,88
Wind dir. red.			0,61	0,61	0,62	0,63
Total reduction			0,19	0,24	0,27	0,26
Total, real			7	92	12	293

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** B - Asuinrakennus B, ~Ristiläntie 459
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.48		04.51 (1)	04.55	06.18		19.08 (22)	07.36	08.00	09.22		
	23.22	41	22.17 (20)	22.18	20.43	26	19.34 (22)	19.05	16.29	15.18		
2	03.49		04.51 (1)	04.58	06.21		19.07 (22)	07.38	08.03	09.24		
	23.21	39	22.16 (20)	22.16	20.40	27	19.34 (22)	19.02	16.26	15.16		
3	03.50		04.52 (1)	05.00	06.23		19.07 (22)	07.41	08.06	09.27		
	23.20	38	22.17 (20)	22.13	20.37	28	19.35 (22)	18.59	16.23	15.15		
4	03.52		04.52 (1)	05.03	06.26		19.06 (22)	07.44	08.09	09.29		
	23.19	36	22.16 (20)	22.10	20.34	28	19.34 (22)	18.56	16.20	15.13		
5	03.53		04.52 (1)	05.06	06.29		19.06 (22)	07.46	08.11	09.31		
	23.17	34	22.15 (20)	22.07	20.30	28	19.34 (22)	18.53	16.18	15.12		
6	03.55		04.53 (1)	05.09	06.31		19.05 (22)	07.49	08.14	09.33		
	23.16	31	22.14 (20)	22.04	20.27	28	19.33 (22)	18.49	16.15	15.11		
7	03.56		04.54 (1)	05.11	06.34		19.05 (22)	07.52	08.17	09.35		
	23.15	27	22.13 (20)	22.01	20.24	28	19.33 (22)	18.46	16.12	15.10		
8	03.58		04.54 (1)	05.14	06.36		19.05 (22)	07.54	08.20	09.37		
	23.13	20	05.14 (1)	21.58	20.21	27	19.32 (22)	18.43	16.09	15.09		
9	04.00		04.55 (1)	05.17	06.39		19.05 (22)	07.57	08.23	09.39		
	23.12	19	05.14 (1)	21.55	20.17	26	19.31 (22)	18.40	16.07	15.08		
10	04.02		04.55 (1)	05.19	06.42		19.06 (22)	07.59	08.26	09.41		
	23.10	18	05.13 (1)	21.52	20.14	24	19.30 (22)	18.37	16.04	15.07		
11	04.04		04.56 (1)	05.22	06.44		19.06 (22)	08.02	08.28	09.42		
	23.08	17	05.13 (1)	21.49	20.11	22	19.28 (22)	18.33	16.01	15.06		
12	04.06		04.57 (1)	05.25	06.47		19.08 (22)	08.05	08.31	09.44		
	23.06	15	05.12 (1)	21.46	20.08	18	19.26 (22)	18.30	15.59	15.05		
13	04.08		04.59 (1)	05.28	06.49		19.09 (22)	08.07	08.34	09.45		
	23.04	13	05.12 (1)	21.43	20.04	14	19.23 (22)	18.27	15.56	15.05		
14	04.10		05.01 (1)	05.30	06.52		19.13 (22)	08.10	08.37	09.47		
	23.02	10	05.11 (1)	21.40	20.01	7	19.20 (22)	18.24	15.54	15.04		
15	04.12		05.03 (1)	05.33	06.54			08.13	08.40	09.48		
	23.00	8	05.11 (1)	21.37	19.58			18.21	15.51	15.04		
16	04.15		05.04 (1)	05.36	06.57			08.16	08.43	09.49		
	22.58	4	05.08 (1)	21.34	19.54			18.18	15.49	15.04		
17	04.17			05.38	07.00			08.18	08.45	09.51		
	22.56			21.31	19.51			18.14	15.46	15.04		
18	04.19			05.41	07.02			08.21	08.48	09.52		
	22.54			21.28	19.48			18.11	15.44	15.04		
19	04.22			05.44	07.05			08.24	08.51	09.52		
	22.52			21.25	19.45			18.08	15.42	15.04		
20	04.24			05.46	07.07			08.26	08.54	09.53		
	22.49			21.22	19.41			18.05	15.39	15.04		
21	04.27			05.49	07.10			08.29	08.56	09.54		
	22.47			21.18	19.38			18.02	15.37	15.04		
22	04.29			05.52	07.12			08.32	08.59	09.55		
	22.45			21.15	19.35			17.59	15.35	15.05		
23	04.32			05.54	07.15			08.35	09.02	09.55		
	22.42			21.12	19.32			17.56	15.33	15.05		
24	04.34			05.57	07.18			08.38	09.05	09.55		
	22.40			21.09	19.28			17.53	15.31	15.06		
25	04.37			06.00	07.20			09.07	09.07	09.56		
	22.37			21.06	19.25			16.50	15.29	15.07		
26	04.39			06.02	07.23			07.43	09.10	09.56		
	22.35			21.03	19.22			16.47	15.27	15.07		
27	04.42			06.05	19.17 (22)	07.25		07.46	09.12	09.56		
	22.32			20.59	11 19.28 (22)	19.18		16.44	15.25	15.08		
28	04.44			06.08	17 19.14 (22)	07.28		07.49	09.15	09.56		
	22.29			20.56	17 19.31 (22)	19.15		16.41	15.23	15.09		
29	04.47			06.10	19.12 (22)	07.31		07.52	09.17	09.56		
	22.27			20.53	20 19.32 (22)	19.12		16.38	15.21	15.11		
30	04.50			06.13	19.11 (22)	07.33		07.54	09.20	09.55		
	22.24			20.50	22 19.33 (22)	19.09		16.35	15.19	15.12		
31	04.52			06.16	19.09 (22)			07.57		09.55		
	22.21			20.47	24 19.33 (22)			16.32		15.13		
Potential sun hours	578			495		390		311	215	167		
Total, worst case		370			94		331					
Sun reduction		0,48			0,43		0,36					
Oper. time red.		0,88			0,88		0,88					
Wind dir. red.		0,63			0,61		0,61					
Total reduction		0,26			0,23		0,19					
Total, real		97			22		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)	Minutes with flicker	Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** C - Lomarakennus C, ~Variksentie 93
 Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.06	16.29	15.18
2	09.54	08.56	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.34	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.10	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.14	20.38	22.00	23.14	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.49
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.55
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** D - Asuinrakennus D, ~Kankaanpääntie 646
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09:54 15:15	08:59 16:32	07:37 17:52	06:57 20:16	05:22 21:38	04:01 22:59	03:48 23:22	04:55 22:19	05:50 (22) 20:44	06:18 19:06	07:36 16:29	08:00 15:18
2	09:54 15:17	08:57 16:35	07:34 17:55	06:54 20:19	05:18 21:41	03:59 23:01	03:49 23:21	04:58 22:16	05:53 (22) 20:40	06:21 19:02	07:39 16:26	08:03 15:16
3	09:53 15:19	08:54 16:38	07:31 17:58	06:50 20:22	05:15 21:44	03:58 23:03	03:51 23:20	05:01 22:13	05:36 (22) 20:37	06:24 18:59	07:41 16:24	08:06 15:15
4	09:52 15:21	08:51 16:41	07:28 18:01	06:47 20:24	05:12 21:46	03:56 23:05	03:52 23:19	05:03 22:10	05:36 (22) 20:34	06:26 18:56	07:44 16:21	08:09 15:14
5	09:51 15:22	08:49 16:44	07:24 18:04	06:44 20:27	05:10 21:49	03:54 23:07	03:53 23:17	05:06 22:07	05:36 (22) 20:31	06:29 18:53	07:46 16:18	08:12 15:12
6	09:50 15:24	08:46 16:47	07:21 18:06	06:41 20:30	05:07 21:52	03:53 23:09	03:55 23:16	05:09 22:04	05:37 (22) 20:27	06:31 18:50	07:49 16:15	08:14 15:11
7	09:49 15:26	08:43 16:49	07:18 18:09	06:37 20:32	05:04 21:55	03:51 23:11	03:57 23:15	05:12 22:01	05:36 (22) 20:24	06:34 18:46	07:52 16:12	08:17 15:10
8	09:48 15:28	08:40 16:52	07:15 18:12	06:34 20:35	05:01 21:58	03:50 23:12	03:58 23:13	05:14 21:58	05:36 (22) 20:21	06:37 18:43	07:54 16:10	08:20 15:09
9	09:47 15:31	08:37 16:55	07:12 18:15	06:31 20:38	04:58 22:00	03:49 23:14	04:00 23:12	05:17 21:55	05:36 (22) 20:18	07:57 18:40	08:23 16:07	09:39 15:08
10	09:45 15:33	08:35 16:58	07:08 18:17	06:28 20:40	04:55 22:03	03:47 23:15	04:02 23:10	05:20 21:53	05:36 (22) 20:14	08:00 18:37	08:26 16:04	09:41 15:07
11	09:44 15:35	08:32 17:01	07:05 18:20	06:24 20:43	04:52 22:06	03:46 23:17	04:04 23:08	05:22 21:49	05:36 (22) 20:11	08:02 18:34	08:29 16:02	09:42 15:06
12	09:42 15:37	08:29 17:04	07:02 18:23	06:21 20:46	04:49 22:09	03:45 23:18	04:06 23:06	05:25 21:46	05:36 (22) 20:08	08:05 18:30	08:31 15:59	09:44 15:06
13	09:41 15:40	08:26 17:07	06:59 18:25	06:18 20:49	04:47 22:11	03:44 23:19	04:08 23:05	05:28 21:43	05:36 (22) 20:04	08:08 18:27	08:34 15:56	09:46 15:05
14	09:39 15:42	08:23 17:10	06:56 18:28	06:15 20:51	04:44 22:14	03:44 23:20	04:10 23:03	05:30 21:40	05:36 (22) 20:01	08:10 18:24	08:37 15:54	09:47 15:05
15	09:37 15:45	08:20 17:13	06:52 18:31	06:12 20:54	04:41 22:17	03:43 23:21	04:13 23:01	05:33 21:37	05:36 (22) 19:58	08:13 18:21	08:40 15:51	09:48 15:04
16	09:36 15:47	08:17 17:16	06:49 18:33	06:08 20:57	04:38 22:19	03:43 23:22	04:15 22:58	05:36 21:34	05:36 (22) 19:55	08:16 18:18	08:43 15:49	09:50 15:04
17	09:34 15:50	08:14 17:19	06:46 18:36	06:05 20:59	04:36 22:22	03:42 23:23	04:17 22:56	05:39 21:31	05:36 (22) 19:51	08:18 18:15	08:46 15:46	09:51 15:04
18	09:32 15:53	08:11 17:21	06:43 18:39	06:02 21:02	04:33 22:25	03:42 23:24	04:20 22:54	05:41 21:28	05:36 (22) 19:48	08:21 18:11	08:48 15:44	09:52 15:04
19	09:30 15:55	08:08 17:24	06:39 18:42	05:59 21:05	04:30 22:27	03:42 23:24	04:22 22:52	05:44 21:25	05:36 (22) 19:45	08:24 18:08	08:51 15:42	09:53 15:04
20	09:28 15:58	08:05 17:27	06:36 18:44	05:56 21:08	04:28 22:30	03:41 23:25	04:24 22:50	05:47 21:22	05:36 (22) 19:42	08:27 18:05	08:54 15:39	09:53 15:04
21	09:26 16:01	08:02 17:30	06:33 18:47	05:52 21:10	04:25 22:33	03:41 23:25	04:27 22:47	05:49 21:19	05:36 (22) 19:38	08:29 18:02	08:57 15:37	09:54 15:04
22	09:23 16:03	07:59 17:33	06:30 18:50	05:49 21:13	04:23 22:35	03:42 23:25	04:29 22:45	05:52 21:15	05:36 (22) 19:35	08:32 17:59	08:59 15:35	09:55 15:05
23	09:21 16:06	07:56 17:36	06:26 18:52	05:46 21:16	04:21 22:38	03:42 23:25	04:32 22:42	05:55 21:12	05:36 (22) 19:32	08:35 17:56	09:02 15:33	09:55 15:05
24	09:19 16:09	07:53 17:38	06:23 18:55	05:43 21:19	04:18 22:40	03:42 23:25	04:34 22:40	05:57 21:09	05:36 (22) 19:28	08:38 17:53	09:05 15:31	09:56 15:06
25	09:17 16:12	07:50 17:41	06:20 18:58	05:40 21:21	04:16 22:43	03:43 23:25	04:37 22:37	06:00 21:06	05:36 (22) 19:25	08:40 17:40	09:07 15:29	09:56 15:07
26	09:14 16:15	07:46 17:44	06:16 19:00	05:37 21:24	04:14 22:45	03:43 23:25	04:39 22:35	06:03 21:03	05:36 (22) 19:23	08:43 17:43	09:10 15:27	09:56 15:08
27	09:12 16:17	07:43 17:47	06:13 19:03	05:34 21:27	04:11 22:48	03:44 23:24	04:42 22:32	06:05 21:00	05:36 (22) 19:22	08:46 17:46	09:12 15:25	09:56 15:09
28	09:09 16:20	07:40 17:50	06:10 19:06	05:31 21:30	04:09 22:50	03:45 23:24	04:45 22:30	06:08 20:56	05:36 (22) 19:21	08:49 16:41	09:15 15:23	09:56 15:10
29	09:07 16:23	07:07 20:08	05:28 21:32	04:07 22:52	03:46 23:23	03:46 23:23	04:47 22:27	06:11 20:53	05:42 (22) 19:31	08:52 16:38	09:17 15:21	09:56 15:11
30	09:04 16:26	07:03 20:11	05:25 21:35	04:05 22:55	03:47 23:23	03:47 23:23	04:50 22:24	06:13 20:50	05:43 (22) 19:33	08:55 16:35	09:20 15:20	09:55 15:12
31	09:02 16:29	07:00 20:14	05:00 21:44	04:03 22:57	03:47 23:27	03:47 23:27	04:53 22:21	06:16 20:47	05:45 (22) 19:09	08:57 16:32	09:15 15:14	09:55 15:14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case					477	693	770	3				
Sun reduction					0,50	0,47	0,48	0,43				
Oper. time red.					0,88	0,88	0,88	0,88				
Wind dir. red.					0,63	0,63	0,63	0,63				
Total reduction					0,28	0,26	0,27	0,24				
Total, real					132	181	205	1				

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 16.32	10.16 (21) 10.46 (21)	07.37 17.52	08.20 (20) 08.41 (20)	06.57 20.16
2	09.54 15.17	08.57 16.35	10.16 (21) 10.47 (21)	07.34 17.55	08.20 (20) 08.40 (20)	06.54 20.19
3	09.53 15.19	08.54 16.38	10.15 (21) 10.46 (21)	07.31 17.58	08.20 (20) 08.39 (20)	06.50 20.22
4	09.53 15.20	08.51 16.41	10.16 (21) 10.47 (21)	07.28 18.01	08.21 (20) 08.39 (20)	06.47 20.24
5	09.52 15.22	08.49 16.44	10.16 (21) 10.47 (21)	07.24 18.04	08.21 (20) 08.37 (20)	06.44 20.27
6	09.51 15.24	08.46 16.46	10.17 (21) 10.47 (21)	07.21 18.06	08.22 (20) 08.36 (20)	06.41 20.30
7	09.50 15.26	08.43 16.49	10.17 (21) 10.47 (21)	07.18 18.09	08.25 (20) 08.33 (20)	06.37 20.32
8	09.48 15.28	08.40 16.52	10.17 (21) 10.46 (21)	07.15 18.12	06.34 20.35	20.35
9	09.47 15.30	08.38 16.55	10.18 (21) 10.46 (21)	07.12 18.15	06.31 20.38	20.38
10	09.46 15.33	08.35 16.58	10.19 (21) 10.45 (21)	07.08 18.17	06.28 20.40	20.40
11	09.44 15.35	08.32 17.01	10.20 (21) 10.45 (21)	07.05 18.20	06.24 20.43	20.43
12	09.43 15.37	08.29 17.04	10.21 (21) 10.44 (21)	07.02 18.23	06.21 20.46	20.46
13	09.41 15.40	08.26 17.07	10.22 (21) 10.41 (21)	06.59 18.25	06.18 20.49	20.49
14	09.39 15.42	08.23 17.10	10.24 (21) 10.39 (21)	06.56 18.28	06.15 20.51	20.51
15	09.38 15.45	08.20 17.13	10.28 (21) 10.36 (21)	06.52 18.31	06.12 20.54	20.54
16	09.36 15.47	08.17 17.16	06.49 18.33	06.49 18.33	12 07.08 (19) 06.08 (19)	22.17 04.38
17	09.34 15.50	08.14 17.18	06.46 18.36	06.46 18.36	17 07.10 (19) 06.05 (19)	22.20 04.35
18	09.32 15.52	08.11 17.21	06.43 18.39	06.43 18.39	22 07.12 (19) 06.02 (19)	22.22 04.33
19	09.30 15.55	08.08 17.24	06.39 18.42	06.39 18.42	24 07.13 (19) 06.02 (19)	22.25 04.33
20	09.28 15.58	08.05 17.27	06.36 18.44	06.36 18.44	27 07.14 (19) 06.02 (19)	22.28 04.28
21	09.26 16.00	08.02 17.30	06.33 18.47	06.33 18.47	29 07.15 (19) 06.02 (19)	22.30 04.28
22	09.24 16.03	10.23 (21) 07.59 17.33	06.30 18.50	06.30 18.50	30 07.15 (19) 06.02 (19)	22.33 04.23
23	09.21 16.06	10.21 (21) 07.56 17.36	08.28 (20) 06.26 18.52	06.26 18.52	31 07.15 (19) 06.02 (19)	22.36 04.20
24	09.19 16.09	10.20 (21) 07.53 17.38	7 08.35 (20) 06.23 18.55	06.23 18.55	32 07.16 (19) 06.02 (19)	22.38 04.18
25	09.17 16.12	10.19 (21) 07.50 17.41	13 08.38 (20) 06.20 18.58	06.20 18.58	33 07.16 (19) 06.02 (19)	22.41 04.16
26	09.14 16.14	10.18 (21) 07.47 17.44	16 08.39 (20) 06.16 19.00	06.16 19.00	34 07.16 (19) 06.02 (19)	22.43 04.13
27	09.12 16.17	10.17 (21) 07.43 17.47	18 08.40 (20) 06.13 19.03	06.13 19.03	35 07.16 (19) 06.02 (19)	22.46 04.11
28	09.10 16.20	10.17 (21) 07.40 17.50	20 08.40 (20) 06.10 19.06	06.10 19.06	36 07.16 (19) 06.02 (19)	22.48 04.09
29	09.07 16.23	10.16 (21) 07.37 17.53	20 08.40 (20) 06.07 19.09	06.07 19.09	37 07.15 (19) 06.02 (19)	22.50 04.07
30	09.05 16.26	10.16 (21) 07.34 17.56	20 08.40 (20) 06.04 19.12	06.04 19.12	38 07.15 (19) 06.02 (19)	22.53 04.05
31	09.02 16.29	10.15 (21) 07.31 17.59	20 08.40 (20) 06.01 19.15	06.01 19.15	39 07.14 (19) 06.02 (19)	22.55 04.03
Potential sun hours	194	247	364	443	547	586
Total, worst case	225	481	116	450	192	
Sun reduction	0,16	0,32	0,36	0,45	0,50	
Oper. time red.	0,88	0,88	0,88	0,88	0,88	
Wind dir. red.	0,66	0,65	0,62	0,59	0,59	
Total reduction	0,09	0,19	0,20	0,24	0,26	
Total, real	21	90	23	107	51	

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.48 (21) 09.22
	23.22	22.19	20.44	19.06	16.29	27 10.15 (21) 15.18
2	03.49	04.58	06.21	07.39	08.03	09.47 (21) 09.25
	23.21	22.16	20.40	19.02	16.26	28 10.15 (21) 15.16
3	03.50	05.01	06.24	07.41	08.06	09.47 (21) 09.27
	23.20	22.13	20.37	18.59	16.23	29 10.16 (21) 15.15
4	03.52	05.03	07.03 (19) 06.26	07.44	08.09	09.47 (21) 09.29
	23.19	22.10	9 07.12 (19) 20.34	18.56	16.21	30 10.17 (21) 15.13
5	03.53	05.06	07.00 (19) 06.29	07.46	08.12	09.46 (21) 09.31
	23.18	22.07	15 07.15 (19) 20.31	18.53	16.18	31 10.17 (21) 15.12
6	03.55	05.09	06.58 (19) 06.31	07.49	2 09.03 (20) 08.15	09.46 (21) 09.33
	23.16	22.04	18 07.16 (19) 20.27	18.50	30 09.05 (20) 16.15	10.16 (21) 15.11
7	03.56	05.11	06.57 (19) 06.34	07.52	08.59 (20) 08.17	09.46 (21) 09.35
	23.15	22.02	21 07.18 (19) 20.24	18.46	11 09.10 (20) 16.12	31 10.17 (21) 15.10
8	03.58	05.14	06.55 (19) 06.37	07.54	08.57 (20) 08.20	09.46 (21) 09.37
	23.14	21.59	24 07.19 (19) 20.21	18.43	15 09.12 (20) 16.09	31 10.17 (21) 15.09
9	04.00	05.17	06.55 (19) 06.39	07.57	08.56 (20) 08.23	09.47 (21) 09.39
	23.12	21.56	26 07.21 (19) 20.18	18.40	17 09.13 (20) 16.07	30 10.17 (21) 15.08
10	04.02	05.19	06.53 (19) 06.42	08.00	08.55 (20) 08.26	09.47 (21) 09.41
	23.10	21.53	28 07.21 (19) 20.14	18.37	19 09.14 (20) 16.04	30 10.17 (21) 15.07
11	04.04	05.22	06.52 (19) 06.44	08.02	08.53 (20) 08.29	09.47 (21) 09.43
	23.09	21.50	29 07.21 (19) 20.11	18.33	20 09.13 (20) 16.01	29 10.16 (21) 15.06
12	04.06	05.25	06.52 (19) 06.47	08.05	08.53 (20) 08.32	09.48 (21) 09.44
	23.07	21.47	30 07.22 (19) 20.08	18.30	20 09.13 (20) 15.59	29 10.17 (21) 15.05
13	04.08	05.28	06.51 (19) 06.50	08.08	08.53 (20) 08.34	09.48 (21) 09.46
	23.05	21.44	31 07.22 (19) 20.04	18.27	20 09.13 (20) 15.56	28 10.16 (21) 15.05
14	04.10	05.30	06.51 (19) 06.52	08.10	08.53 (20) 08.37	09.50 (21) 09.47
	23.03	21.41	32 07.23 (19) 20.01	18.24	20 09.13 (20) 15.54	26 10.16 (21) 15.04
15	04.12	05.33	06.50 (19) 06.55	08.13	08.53 (20) 08.40	09.50 (21) 09.49
	23.01	21.37	33 07.23 (19) 19.58	18.21	19 09.12 (20) 15.51	25 10.15 (21) 15.04
16	04.15	05.36	06.50 (19) 06.57	08.16	08.54 (20) 08.43	09.51 (21) 09.50
	22.59	21.34	33 07.23 (19) 19.55	18.18	18 09.12 (20) 15.49	23 10.14 (21) 15.04
17	04.17	05.38	06.50 (19) 07.00	08.19	08.55 (20) 08.46	09.53 (21) 09.51
	22.57	21.31	33 07.23 (19) 19.51	18.15	15 09.10 (20) 15.46	20 10.13 (21) 15.04
18	04.19	05.41	06.49 (19) 07.02	08.21	08.58 (20) 08.49	09.54 (21) 09.52
	22.54	21.28	33 07.22 (19) 19.48	18.11	11 09.09 (20) 15.44	18 10.12 (21) 15.04
19	04.22	05.44	06.50 (19) 07.05	08.24	09.01 (20) 08.51	09.56 (21) 09.53
	22.52	21.25	32 07.22 (19) 19.45	18.08	5 09.06 (20) 15.42	15 10.11 (21) 15.04
20	04.24	05.47	06.49 (19) 07.08	08.27	08.54 (20) 08.54	09.58 (21) 09.54
	22.50	21.22	32 07.21 (19) 19.42	18.05	11 15.39	10.09 (21) 15.04
21	04.27	05.49	06.50 (19) 07.10	08.29	08.57 (20) 08.57	09.54 (21) 09.54
	22.47	21.19	31 07.21 (19) 19.38	18.02	1 15.37	10.05 (21) 15.04
22	04.29	05.52	06.50 (19) 07.13	08.32	09.00 (20) 09.00	09.55 (21) 09.55
	22.45	21.16	30 07.20 (19) 19.35	17.59	15.35	15.05
23	04.32	05.55	06.51 (19) 07.15	08.35	09.02 (20) 09.02	09.55 (21) 09.55
	22.43	21.12	28 07.19 (19) 19.32	17.56	15.33	15.05
24	04.34	05.57	06.51 (19) 07.18	08.38	09.05 (20) 09.05	09.56 (21) 09.56
	22.40	21.09	27 07.18 (19) 19.28	17.53	15.31	15.06
25	04.37	06.00	06.52 (19) 07.20	07.41	09.07 (20) 09.07	09.56 (21) 09.56
	22.38	21.06	25 07.17 (19) 19.25	16.50	15.29	15.07
26	04.39	06.03	06.53 (19) 07.23	07.43	09.10 (20) 09.10	09.56 (21) 09.56
	22.35	21.03	22 07.15 (19) 19.22	16.47	15.27	15.07
27	04.42	06.05	06.56 (19) 07.26	07.46	09.56 (21) 09.13	09.56 (21) 09.56
	22.32	21.00	17 07.13 (19) 19.19	16.44	10 10.06 (21) 15.25	15.08
28	04.44	06.08	06.58 (19) 07.28	07.49	09.53 (21) 09.15	09.56 (21) 09.56
	22.30	20.56	11 07.09 (19) 19.15	16.41	16 10.09 (21) 15.23	15.09
29	04.47	06.10	07.31 (19) 07.52	07.52	09.51 (21) 09.18	09.56 (21) 09.56
	22.27	20.53	19.12	16.38	20 10.11 (21) 15.21	15.11
30	04.50	06.13	07.33 (19) 07.55	07.55	09.50 (21) 09.20	09.56 (21) 09.56
	22.24	20.50	19.09	16.35	23 10.13 (21) 15.19	15.12
31	04.52	06.16	07.57 (19) 07.57	07.57	09.49 (21) 09.49	09.55 (21) 09.55
	22.22	20.47	16.32	16.32	25 10.14 (21) 15.14	15.13
Potential sun hours	579	495	390	311	215	166
Total, worst case		650		306		522
Sun reduction		0,43		0,25		0,16
Oper. time red.		0,88		0,88		0,88
Wind dir. red.		0,59		0,63		0,66
Total reduction		0,23		0,14		0,10
Total, real		147		44		50

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** F - Asuinrakennus F, ~Välisalontie 101
 Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	10.55 (21)	07.37	06.57	07.44 (19)
	15.15	16.32	11.14 (21)	17.52	20.16	27 08.11 (19)
2	09.54	08.57	10.56 (21)	07.34	06.54	07.43 (19)
	15.17	16.35	11.13 (21)	17.55	20.19	29 08.12 (19)
3	09.53	08.54	10.57 (21)	07.31	06.50	07.41 (19)
	15.18	16.38	11.10 (21)	17.58	20.22	31 08.12 (19)
4	09.53	08.51	11.01 (21)	07.28	06.47	07.41 (19)
	15.20	16.41	11.07 (21)	18.01	20.24	32 08.13 (19)
5	09.52	08.49		07.24	06.44	07.40 (19)
	15.22	16.43		18.04	20.27	34 08.14 (19)
6	09.51	08.46		07.21	06.41	07.38 (19)
	15.24	16.46		18.06	20.30	35 08.13 (19)
7	09.50	10.53 (21)	08.43	07.18	06.37	07.38 (19)
	15.26	10.59 (21)	16.49	18.09	20.32	35 08.13 (19)
8	09.48	10.52 (21)	08.40	07.15	06.34	07.38 (19)
	15.28	11.02 (21)	16.52	18.12	20.35	35 08.13 (19)
9	09.47	10.51 (21)	08.38	07.12	06.31	07.37 (19)
	15.30	11.04 (21)	16.55	18.14	20.38	36 08.13 (19)
10	09.46	10.51 (21)	08.35	07.08	06.28	07.37 (19)
	15.33	11.05 (21)	16.58	18.17	20.40	36 08.13 (19)
11	09.44	10.49 (21)	08.32	07.05	06.24	07.38 (19)
	15.35	11.06 (21)	17.01	18.20	20.43	34 08.12 (19)
12	09.43	10.49 (21)	08.29	07.02	06.21	07.38 (19)
	15.37	11.08 (21)	17.04	18.23	20.46	34 08.12 (19)
13	09.41	10.49 (21)	08.26	09.01 (20)	06.18	07.38 (19)
	15.40	11.08 (21)	17.07	09.08 (20)	20.49	33 08.11 (19)
14	09.39	10.49 (21)	08.23	08.58 (20)	06.15	07.38 (19)
	15.42	11.10 (21)	17.10	18.28	20.51	31 08.09 (19)
15	09.38	10.48 (21)	08.20	08.55 (20)	06.12	07.38 (19)
	15.45	11.11 (21)	17.13	18.31	20.54	30 08.08 (19)
16	09.36	10.48 (21)	08.17	08.53 (20)	06.08	07.39 (19)
	15.47	11.11 (21)	17.16	18.33	20.57	28 08.07 (19)
17	09.34	10.49 (21)	08.14	08.53 (20)	06.05	07.40 (19)
	15.50	11.13 (21)	17.18	18.36	21.00	25 08.05 (19)
18	09.32	10.48 (21)	08.11	08.53 (20)	06.02	07.41 (19)
	15.52	11.13 (21)	17.21	18.39	21.02	22 08.03 (19)
19	09.30	10.48 (21)	08.08	08.53 (20)	05.59	07.43 (19)
	15.55	11.14 (21)	17.24	18.42	21.05	17 08.00 (19)
20	09.28	10.48 (21)	08.05	08.52 (20)	05.56	07.46 (19)
	15.58	11.14 (21)	17.27	18.44	21.08	11 07.57 (19)
21	09.26	10.48 (21)	08.02	08.53 (20)	05.52	07.46 (19)
	16.00	11.14 (21)	17.30	18.47	21.10	22.33
22	09.24	10.48 (21)	07.59	08.54 (20)	05.49	07.43 (19)
	16.03	11.15 (21)	17.33	18.50	21.13	22.36
23	09.21	10.48 (21)	07.56	08.54 (20)	05.46	07.43 (19)
	16.06	11.15 (21)	17.36	18.52	21.16	22.38
24	09.19	10.49 (21)	07.53	08.55 (20)	05.43	07.43 (19)
	16.09	11.15 (21)	17.38	18.55	21.19	22.41
25	09.17	10.49 (21)	07.50	08.58 (20)	05.40	07.43 (19)
	16.12	11.16 (21)	17.41	18.58	21.22	22.43
26	09.14	10.49 (21)	07.47	08.58 (20)	05.37	07.43 (19)
	16.14	11.16 (21)	17.44	19.00	21.24	22.46
27	09.12	10.50 (21)	07.43	08.58 (20)	05.34	07.43 (19)
	16.17	11.16 (21)	17.47	19.03	21.27	22.48
28	09.10	10.51 (21)	07.40	08.58 (20)	05.31	07.43 (19)
	16.20	11.16 (21)	17.50	19.06	21.30	22.50
29	09.07	10.51 (21)	07.37	08.58 (20)	05.27	07.43 (19)
	16.23	11.16 (21)	17.53	19.09	21.33	22.53
30	09.05	10.52 (21)	07.34	08.58 (20)	05.24	07.43 (19)
	16.26	11.15 (21)	17.56	19.12	21.35	22.55
31	09.02	10.53 (21)	07.31	08.58 (20)	05.21	07.43 (19)
	16.29	11.15 (21)	17.59	19.15	21.38	22.57
Potential sun hours	194	247	364	443	595	586
Total, worst case	547	257	55	595		
Sun reduction	0,16	0,32	0,36	0,45		
Oper. time red.	0,88	0,88	0,88	0,88		
Wind dir. red.	0,66	0,64	0,61	0,61		
Total reduction	0,10	0,18	0,20	0,24		
Total, real	52	47	11	146		

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** F - Asuinrakennus F, ~Välisalontie 101
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	July	August	September	October	November	December			
1	03.48	04.55	06.18	07.36 (19)	07.36	08.00	09.22	10.32 (21)	
	23.22	22.19	20.44	35 08.11 (19)	19.06	16.29	15.18	16 10.48 (21)	
2	03.49	04.58	06.21	07.35 (19)	07.39	08.03	09.25	10.33 (21)	
	23.21	22.16	20.40	36 08.11 (19)	19.02	16.26	15.16	15 10.48 (21)	
3	03.50	05.00	06.24	07.35 (19)	07.41	08.06	09.27	10.34 (21)	
	23.20	22.13	20.37	36 08.11 (19)	18.59	16.23	15.15	13 10.47 (21)	
4	03.52	05.03	06.26	07.35 (19)	07.44	08.09	09.29	10.36 (21)	
	23.19	22.10	20.34	35 08.10 (19)	18.56	16.21	15.13	10 10.46 (21)	
5	03.53	05.06	06.29	07.35 (19)	07.46	08.12	09.31	10.38 (21)	
	23.18	22.07	20.31	35 08.10 (19)	18.53	16.18	15.12	7 10.45 (21)	
6	03.55	05.09	06.31	07.34 (19)	07.49	08.15	09.33		
	23.16	22.05	20.27	35 08.09 (19)	18.49	16.15	15.11		
7	03.56	05.11	06.34	07.35 (19)	07.52	08.17	10.31 (21)	09.35	
	23.15	22.02	20.24	34 08.09 (19)	18.46	16.12	7 10.38 (21)	15.10	
8	03.58	05.14	06.37	07.35 (19)	07.54	08.20	10.28 (21)	09.37	
	23.14	21.59	20.21	32 08.07 (19)	18.43	16.09	13 10.41 (21)	15.09	
9	04.00	05.17	06.39	07.36 (19)	07.57	08.23	10.27 (21)	09.39	
	23.12	21.56	20.18	31 08.07 (19)	18.40	16.07	17 10.44 (21)	15.08	
10	04.02	05.19	06.42	07.36 (19)	08.00	08.26	10.25 (21)	09.41	
	23.10	21.53	20.14	29 08.05 (19)	18.37	16.04	20 10.45 (21)	15.07	
11	04.04	05.22	06.44	07.37 (19)	08.02	08.29	10.24 (21)	09.43	
	23.09	21.50	20.11	27 08.04 (19)	18.33	16.01	22 10.46 (21)	15.06	
12	04.06	05.25	06.47	07.38 (19)	08.05	08.32	10.24 (21)	09.44	
	23.07	21.47	20.08	24 08.02 (19)	18.30	15.59	23 10.47 (21)	15.05	
13	04.08	05.28	06.50	07.40 (19)	08.08	08.35	10.23 (21)	09.46	
	23.05	21.44	20.04	20 08.00 (19)	18.27	15.56	24 10.47 (21)	15.05	
14	04.10	05.30	06.52	07.42 (19)	08.10	08.37	10.23 (21)	09.47	
	23.03	21.41	20.01	15 07.57 (19)	18.24	15.54	26 10.49 (21)	15.04	
15	04.12	05.33	06.55	07.47 (19)	08.13	08.40	10.23 (21)	09.49	
	23.01	21.37	19.58	4 07.51 (19)	18.21	15.51	26 10.49 (21)	15.04	
16	04.15	05.36	06.57		08.16	08.43	10.22 (21)	09.50	
	22.59	21.34	19.55		18.18	15.49	27 10.49 (21)	15.04	
17	04.17	05.38	07.00		08.19	08.46	10.23 (21)	09.51	
	22.57	21.31	19.51		18.15	9 09.38 (20)	15.46	27 10.50 (21)	15.04
18	04.19	05.41	07.02		08.21	09.27 (20)	08.49	10.23 (21)	09.52
	22.54	21.28	19.48		18.11	13 09.40 (20)	15.44	26 10.49 (21)	15.03
19	04.22	05.44	07.05		08.24	09.25 (20)	08.51	10.23 (21)	09.53
	22.52	21.25	19.45		18.08	17 09.42 (20)	15.42	27 10.50 (21)	15.04
20	04.24	05.46	07.08		08.27	09.24 (20)	08.54	10.23 (21)	09.54
	22.50	21.22	19.42		18.05	18 09.42 (20)	15.39	27 10.50 (21)	15.04
21	04.27	05.49	07.10		08.29	09.24 (20)	08.57	10.24 (21)	09.54
	22.47	21.19	19.38		18.02	19 09.43 (20)	15.37	26 10.50 (21)	15.04
22	04.29	05.52	07.13		08.32	09.23 (20)	09.00	10.24 (21)	09.55
	22.45	21.16	19.35		17.59	20 09.43 (20)	15.35	26 10.50 (21)	15.05
23	04.32	05.55	07.15	07.50 (19)	08.35	09.23 (20)	09.02	10.25 (21)	09.56
	22.43	21.12	19.32	12 08.02 (19)	17.56	20 09.43 (20)	15.33	26 10.51 (21)	15.05
24	04.34	05.57	07.18	07.46 (19)	08.38	09.23 (20)	09.05	10.25 (21)	09.56
	22.40	21.09	18 08.04 (19)	19.28	17.53	19 09.42 (20)	15.31	25 10.50 (21)	15.06
25	04.37	06.00	07.20	07.45 (19)	07.41	08.23 (20)	09.07	10.26 (21)	09.56
	22.38	21.06	22 08.07 (19)	19.25	16.50	19 08.42 (20)	15.29	24 10.50 (21)	15.06
26	04.39	06.03	07.23	07.43 (19)	07.43	08.23 (20)	09.10	10.27 (21)	09.56
	22.35	21.03	25 08.08 (19)	19.22	16.47	18 08.41 (20)	15.27	23 10.50 (21)	15.07
27	04.42	06.05	07.26	07.42 (19)	07.46	08.25 (20)	09.13	10.28 (21)	09.56
	22.32	21.00	27 08.09 (19)	19.19	16.44	15 08.40 (20)	15.25	22 10.50 (21)	15.08
28	04.44	06.08	07.28	07.40 (19)	07.49	08.28 (20)	09.15	10.28 (21)	09.56
	22.30	20.56	30 08.10 (19)	19.15	16.41	11 08.39 (20)	15.23	21 10.49 (21)	15.09
29	04.47	06.10	07.31	07.38 (19)	07.52	08.31 (20)	09.18	10.30 (21)	09.56
	22.27	20.53	32 08.10 (19)	19.12	16.38	6 08.37 (20)	15.21	20 10.50 (21)	15.11
30	04.50	06.13	07.33	07.38 (19)	07.55	09.20	10.31 (21)	09.56	
	22.24	20.50	33 08.11 (19)	19.09	16.35	15.19	18 10.49 (21)	15.12	
31	04.52	06.16	07.37 (19)		07.57			09.55	
	22.22	20.47	34 08.11 (19)		16.32			15.13	
Potential sun hours	579	495	390		311	215		166	
Total, worst case		233	428		204	543		61	
Sun reduction		0,43	0,36		0,25	0,16		0,11	
Oper. time red.		0,88	0,88		0,88	0,88		0,88	
Wind dir. red.		0,61	0,61		0,63	0,66		0,66	
Total reduction		0,23	0,20		0,14	0,10		0,06	
Total, real		54	84		29	53		4	

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	
1	09.55	08.59	07.37	08.31 (22)	06.57	07.34 (20)	05.21
	15.15	16.32	17.52	18	08.49 (22)	20.16	54
2	09.54	08.57	07.34	08.31 (22)	06.54	07.33 (20)	05.18
	15.17	16.35	17.55	16	08.47 (22)	20.19	52
3	09.53	08.54	07.31	08.32 (22)	06.50	07.33 (20)	05.15
	15.19	16.38	17.58	14	08.46 (22)	20.22	49
4	09.53	08.51	07.28	08.34 (22)	06.47	07.33 (20)	05.12
	15.20	16.41	18.01	10	08.44 (22)	20.24	47
5	09.52	08.49	07.24	07.24	06.44	07.34 (20)	05.09
	15.22	16.44	18.04	20.27	41	08.46 (21)	21.49
6	09.51	08.46	07.21	06.41	07.35 (20)	05.06	03.52
	15.24	16.47	18.06	20.30	36	08.44 (21)	21.52
7	09.49	08.43	07.18	06.37	07.37 (20)	05.04	03.51
	15.26	16.49	18.09	20.32	25	08.40 (21)	21.55
8	09.48	08.40	07.15	06.34	08.25 (21)	05.01	03.50
	15.28	16.52	18.12	20.35	12	08.37 (21)	21.58
9	09.47	08.37	07.12	06.31	06.31	04.58	03.48
	15.30	16.55	18.15	20.38	22.00	23.14	19
10	09.46	08.35	07.08	06.28	04.55	03.47	05.12 (19)
	15.33	16.58	18.17	20.40	22.03	23.16	19
11	09.44	08.32	07.05	06.24	04.52	03.46	05.13 (19)
	15.35	17.01	18.20	20.43	22.06	23.17	18
12	09.43	08.29	07.02	06.21	04.49	03.45	05.13 (19)
	15.37	17.04	18.23	20.46	22.09	23.18	18
13	09.41	08.26	06.59	06.18	04.46	03.44	05.14 (19)
	15.40	17.07	18.25	20.49	22.12	23.19	18
14	09.39	08.23	06.56	06.15	04.44	03.44	05.14 (19)
	15.42	17.10	18.28	20.51	22.14	23.21	17
15	09.38	08.20	06.52	06.12	04.41	03.43	05.14 (19)
	15.45	17.13	18.31	20.54	22.17	23.22	17
16	09.36	08.17	06.49	06.08	04.38	03.42	05.15 (19)
	15.47	17.16	18.33	2	07.41 (21)	20.57	22.20
17	09.34	08.14	06.46	07.32 (21)	06.05	04.36	05.16 (19)
	15.50	17.19	18.36	15	07.47 (21)	21.00	22.22
18	09.32	08.11	06.43	06.02	04.33	05.14 (19)	03.42
	15.52	17.21	18.39	21	07.49 (21)	21.02	22.25
19	09.30	08.08	06.39	05.59	04.30	05.12 (19)	03.41
	15.55	17.24	18.42	25	07.51 (21)	21.05	22.28
20	09.28	08.05	06.36	05.56	04.28	05.10 (19)	03.41
	15.58	17.27	7	08.45 (22)	18.44	28	07.52 (21)
21	09.26	08.02	06.33	05.52	04.25	05.10 (19)	03.41
	16.01	17.30	12	08.47 (22)	18.47	30	07.52 (21)
22	09.24	07.59	06.30	05.49	04.23	05.09 (19)	03.41
	16.03	17.33	16	08.49 (22)	18.50	32	07.53 (21)
23	09.21	07.56	06.26	05.46	04.20	05.10 (19)	03.42
	16.06	17.36	18	08.49 (22)	18.52	34	07.54 (21)
24	09.19	07.53	06.23	05.43	04.18	05.09 (19)	03.42
	16.09	17.38	20	08.50 (22)	18.55	35	07.55 (21)
25	09.17	07.50	06.20	05.40	04.16	05.09 (19)	03.43
	16.12	17.41	20	08.50 (22)	18.58	36	07.54 (21)
26	09.14	07.47	06.17	05.37	04.13	05.08 (19)	03.43
	16.15	17.44	21	08.51 (22)	19.00	36	07.54 (21)
27	09.12	07.43	06.13	05.34	04.11	05.08 (19)	03.44
	16.17	17.47	20	08.50 (22)	19.03	45	07.55 (21)
28	09.10	07.40	06.10	05.31	04.09	05.09 (19)	03.45
	16.20	17.50	20	08.50 (22)	19.06	49	07.53 (21)
29	09.07		06.07	05.28	04.07	05.08 (19)	03.46
	16.23		20.08	53	08.53 (21)	21.33	22.53
30	09.05		06.03	05.24	04.05	05.09 (19)	03.47
	16.26		20.11	54	08.53 (21)	21.35	22.55
31	09.02		06.00	05.20	04.03	05.09 (19)	
	16.29		20.14	54	08.52 (21)	21.35	22.57
Potential sun hours	194	247	364	443	547	586	
Total, worst case		154	607	316	278	540	
Sun reduction		0,32	0,36	0,45	0,50	0,47	
Oper. time red.		0,88	0,88	0,88	0,88	0,88	
Wind dir. red.		0,63	0,60	0,60	0,63	0,63	
Total reduction		0,18	0,19	0,24	0,28	0,26	
Total, real		27	116	75	77	140	

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	05.17 (19)	04.55	06.18	07.36	08.00
	23.22	19 05.36 (19)	22.19	20.44	19.06	16.29
2	03.49	05.17 (19)	04.58	06.21	07.39	08.03
	23.21	19 05.36 (19)	22.16	20.40	19.02	16.26
3	03.50	05.17 (19)	05.01	06.24	07.41	08.06
	23.20	19 05.36 (19)	22.13	20.37	18.59	16.23
4	03.52	05.17 (19)	05.03	06.26	08.22 (21)	07.44
	23.19	20 05.37 (19)	22.10	20.34	12 08.34 (21)	18.56
5	03.53	05.17 (19)	05.06	06.29	07.34 (20)	07.46
	23.18	20 05.37 (19)	22.07	20.31	25 08.37 (21)	18.53
6	03.55	05.17 (19)	05.09	06.31	07.31 (20)	07.49
	23.16	20 05.37 (19)	22.04	20.27	35 08.39 (21)	18.50
7	03.57	05.17 (19)	05.11	06.34	07.29 (20)	07.52
	23.15	21 05.38 (19)	22.02	20.24	42 08.41 (21)	18.46
8	03.58	05.17 (19)	05.14	06.37	07.28 (20)	07.54
	23.13	21 05.38 (19)	21.59	20.21	46 08.42 (21)	18.43
9	04.00	05.17 (19)	05.17	06.39	07.27 (20)	07.57
	23.12	22 05.39 (19)	21.56	20.18	50 08.43 (21)	18.40
10	04.02	05.17 (19)	05.20	06.42	07.26 (20)	08.00
	23.10	21 05.38 (19)	21.53	20.14	52 08.43 (21)	18.37
11	04.04	05.17 (19)	05.22	06.44	07.26 (20)	08.02
	23.08	22 05.39 (19)	21.50	20.11	53 08.44 (21)	18.34
12	04.06	05.18 (19)	05.25	06.47	07.25 (20)	08.05
	23.07	21 05.39 (19)	21.47	20.08	55 08.44 (21)	18.30
13	04.08	05.17 (19)	05.28	06.50	07.26 (20)	08.08
	23.05	22 05.39 (19)	21.44	20.05	54 08.44 (21)	18.27
14	04.10	05.17 (19)	05.30	06.52	07.26 (20)	08.10
	23.03	22 05.39 (19)	21.41	20.01	53 08.44 (21)	18.24
15	04.13	05.18 (19)	05.33	06.55	07.29 (20)	08.13
	23.01	22 05.40 (19)	21.37	19.58	49 08.44 (21)	18.21
16	04.15	05.18 (19)	05.36	06.57	07.31 (20)	08.16
	22.59	22 05.40 (19)	21.34	19.55	45 08.43 (21)	18.18
17	04.17	05.18 (19)	05.39	07.00	07.34 (20)	08.19
	22.57	22 05.40 (19)	21.31	19.51	38 08.43 (21)	18.15
18	04.19	05.18 (19)	05.41	07.02	08.06 (21)	08.21
	22.54	21 05.39 (19)	21.28	19.48	36 08.42 (21)	18.11
19	04.22	05.18 (19)	05.44	07.05	08.06 (21)	08.24
	22.52	21 05.39 (19)	21.25	19.45	36 08.42 (21)	18.08
20	04.24	05.18 (19)	05.47	07.08	08.06 (21)	08.27
	22.50	20 05.38 (19)	21.22	19.42	34 08.40 (21)	18.05
21	04.27	05.19 (19)	05.49	07.10	08.07 (21)	08.29
	22.47	19 05.38 (19)	21.19	19.38	32 08.39 (21)	18.02
22	04.29	05.20 (19)	05.52	07.13	08.07 (21)	08.32
	22.45	19 05.39 (19)	21.16	19.35	31 08.38 (21)	17.59
23	04.32	05.21 (19)	05.55	07.15	08.08 (21)	08.35
	22.43	17 05.38 (19)	21.12	19.32	28 08.36 (21)	17.56
24	04.34	05.22 (19)	05.57	07.18	08.09 (21)	08.38
	22.40	15 05.37 (19)	21.09	19.29	26 08.35 (21)	17.53
25	04.37	05.23 (19)	06.00	07.20	08.10 (21)	07.41
	22.38	13 05.36 (19)	21.06	19.25	22 08.32 (21)	16.50
26	04.39	05.25 (19)	06.03	07.23	08.13 (21)	07.43
	22.35	9 05.34 (19)	21.03	19.22	17 08.30 (21)	16.47
27	04.42	05.27 (19)	06.05	07.26	08.16 (21)	07.46
	22.32	5 05.32 (19)	21.00	19.19	9 08.25 (21)	16.44
28	04.45		06.08	07.28		07.49
	22.30		20.56	19.15		16.41
29	04.47		06.11	07.31		07.52
	22.27		20.53	19.12		16.38
30	04.50		06.13	07.33		07.55
	22.24		20.50	19.09		16.35
31	04.53		06.16			07.57
	22.22		20.47			16.32
Potential sun hours	578	495	390	311	215	166
Total, worst case	514		880		221	
Sun reduction	0,48		0,36		0,25	
Oper. time red.	0,88		0,88		0,88	
Wind dir. red.	0,63		0,60		0,63	
Total reduction	0,27		0,19		0,14	
Total, real	136		167		31	

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)

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** H - Lomarakenus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	10.19 (21)	07.37	06.57	08.10 (19)
	15.15	16.32	19 10.38 (21)	17.52	20.16	16 08.26 (19)
2	09.54	08.57	10.20 (21)	07.34	06.54	08.12 (19)
	15.17	16.35	17 10.37 (21)	17.55	20.19	11 08.23 (19)
3	09.53	08.54	10.20 (21)	07.31	06.50	05.15
	15.19	16.38	15 10.35 (21)	17.58	20.22	21.44
4	09.53	08.51	10.22 (21)	07.28	06.47	05.12
	15.20	16.41	12 10.34 (21)	18.01	20.24	21.47
5	09.52	08.49	10.26 (21)	07.25	06.44	05.09
	15.22	16.43	5 10.31 (21)	18.04	20.27	21.49
6	09.51	08.46		07.21	06.41	05.06
	15.24	16.46		18.06	20.30	21.52
7	09.50	08.43		07.18	06.37	05.03
	15.26	16.49		18.09	20.32	21.55
8	09.48	08.40		07.15	06.34	05.01
	15.28	16.52		18.12	20.35	21.58
9	09.47	08.38		07.12	06.31	04.58
	15.30	16.55		18.15	20.38	22.01
10	09.46	08.35		07.08	06.28	04.55
	15.33	16.58		18.17	20.41	22.03
11	09.44	08.32		07.05	06.24	04.52
	15.35	17.01		18.20	20.43	22.06
12	09.43	08.29		07.02	06.21	04.49
	15.37	17.04		18.23	20.46	22.09
13	09.41	08.26		06.59	06.18	04.46
	15.40	17.07		18.25	20.49	22.12
14	09.39	08.23		06.56	06.15	04.44
	15.42	17.10		18.28	20.51	22.14
15	09.38	08.20		06.52	06.12	04.41
	15.45	17.13		18.31	20.54	22.17
16	09.36	08.17		06.49	06.08	04.38
	15.47	17.16		18.33	20.57	22.20
17	09.34	10.25 (21)	08.14	06.46	06.05	04.35
	15.50	4 10.29 (21)	17.18	18.36	21.00	22.22
18	09.32	10.22 (21)	08.11	06.43	07.18 (19)	06.02
	15.52	9 10.31 (21)	17.21	18.39	9 07.27 (19)	21.02
19	09.30	10.19 (21)	08.08	06.39	07.15 (19)	05.59
	15.55	13 10.32 (21)	17.24	18.42	15 07.30 (19)	21.05
20	09.28	10.17 (21)	08.05	06.36	07.13 (19)	05.56
	15.58	16 10.33 (21)	17.27	18.44	19 07.32 (19)	21.08
21	09.26	10.16 (21)	08.02	06.33	07.10 (19)	05.52
	16.00	18 10.34 (21)	17.30	18.47	22 07.32 (19)	21.11
22	09.24	10.16 (21)	07.59	06.30	07.10 (19)	05.49
	16.03	19 10.35 (21)	17.33	18.50	23 07.33 (19)	21.13
23	09.21	10.16 (21)	07.56	06.26	07.09 (19)	05.46
	16.06	20 10.36 (21)	17.36	18.52	24 07.33 (19)	21.16
24	09.19	10.16 (21)	07.53	06.23	07.08 (19)	05.43
	16.09	20 10.36 (21)	17.38	18.55	26 07.34 (19)	21.19
25	09.17	10.16 (21)	07.50	06.20	07.07 (19)	05.40
	16.12	21 10.37 (21)	17.41	18.58	26 07.33 (19)	21.22
26	09.14	10.16 (21)	07.47	06.16	07.07 (19)	05.37
	16.14	21 10.37 (21)	17.44	19.00	26 07.33 (19)	21.24
27	09.12	10.16 (21)	07.43	06.13	07.07 (19)	05.34
	16.17	22 10.38 (21)	17.47	19.03	26 07.33 (19)	21.27
28	09.10	10.16 (21)	07.40	06.10	07.07 (19)	05.31
	16.20	22 10.38 (21)	17.50	19.06	24 07.31 (19)	21.30
29	09.07	10.17 (21)		07.07	08.07 (19)	05.27
	16.23	21 10.38 (21)		20.08	24 08.31 (19)	21.33
30	09.05	10.17 (21)		07.03	08.08 (19)	05.24
	16.26	21 10.38 (21)		20.11	22 08.30 (19)	21.35
31	09.02	10.18 (21)		07.00	08.09 (19)	
	16.29	20 10.38 (21)		20.14	19 08.28 (19)	
Potential sun hours	194	247	364	443	547	586
Total, worst case	267	68	305	27		
Sun reduction	0,16	0,32	0,36	0,45		
Oper. time red.	0,88	0,88	0,88	0,88		
Wind dir. red.	0,66	0,66	0,60	0,60		
Total reduction	0,09	0,19	0,20	0,24		
Total, real	25	13	60	7		

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.22
	23.22	22.19	20.44	19.06	16.29	15.18
2	03.49	04.58	06.21	07.39	08.03	09.25
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.01	06.24	07.41	08.06	09.27
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.52	05.03	06.26	07.44	08.09	09.29
	23.19	22.10	20.34	18.56	16.21	15.13
5	03.53	05.06	06.29	07.47	08.12	09.31
	23.18	22.07	20.31	18.53	16.18	15.12
6	03.55	05.09	06.31	07.49	08.15	09.34
	23.17	22.05	20.27	18.50	16.15	15.11
7	03.56	05.11	06.34	07.52	08.17	09.36
	23.15	22.02	20.24	18.46	16.12	15.10
8	03.58	05.14	06.37	07.54	08.20	09.37
	23.14	21.59	20.21	18.43	16.09	15.09
9	04.00	05.17	06.39	07.57	08.23	09.39
	23.12	21.56	20.18	18.40	16.07	15.08
10	04.02	05.19	06.42	08.05 (19)	08.00	09.41
	23.10	21.53	20.14	18.37 (19)	16.04	15.07
11	04.04	05.22	06.44	08.03 (19)	08.02	09.43
	23.09	21.50	20.11	18.34 (19)	16.01	15.06
12	04.06	05.25	06.47	08.00 (19)	08.05	09.44
	23.07	21.47	20.08	18.19 (19)	15.59	15.05
13	04.08	05.28	06.50	07.59 (19)	08.08	09.46
	23.05	21.44	20.05	18.27 (19)	15.56	15.05
14	04.10	05.30	06.52	07.58 (19)	08.10	09.47
	23.03	21.41	20.01	18.24 (19)	15.54	15.04
15	04.12	05.33	06.55	07.57 (19)	08.13	09.49
	23.01	21.38	19.58	18.22 (19)	15.51	15.04
16	04.15	05.36	06.57	07.56 (19)	08.16	09.50
	22.59	21.34	19.55	18.21 (19)	15.49	15.04
17	04.17	05.38	07.00	07.56 (19)	08.19	09.51
	22.57	21.31	19.51	18.22 (19)	15.46	15.04
18	04.19	05.41	07.02	07.55 (19)	08.21	09.52
	22.54	21.28	19.48	18.11 (19)	15.44	15.04
19	04.22	05.44	07.05	07.55 (19)	08.24	09.53
	22.52	21.25	19.45	18.21 (19)	15.42	15.04
20	04.24	05.47	07.08	07.54 (19)	08.27	09.54
	22.50	21.22	19.42	18.19 (19)	15.39	15.04
21	04.27	05.49	07.10	07.55 (19)	08.30	09.54
	22.48	21.19	19.38	18.19 (19)	15.37	15.04
22	04.29	05.52	07.13	07.55 (19)	08.32	09.55
	22.45	21.16	19.35	18.17 (19)	15.35	15.05
23	04.32	05.55	07.15	07.56 (19)	08.35	09.56
	22.43	21.12	19.32	18.16 (19)	15.33	15.05
24	04.34	05.57	07.18	07.58 (19)	08.38	09.56
	22.40	21.09	19.29	18.14 (19)	15.31	15.06
25	04.37	06.00	07.20	08.00 (19)	07.41	09.56
	22.38	21.06	19.25	18.11 (19)	15.29	15.06
26	04.39	06.03	07.23	07.43	09.10	09.56
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05	07.26	07.46	09.13	09.56
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.44	06.08	07.28	07.49	09.15	09.56
	22.30	20.57	19.15	16.41	15.23	15.09
29	04.47	06.10	07.31	07.52	09.18	09.56
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13	07.33	07.55	09.20	09.56
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16		07.57		09.55
	22.22	20.47		16.32		15.13
Potential sun hours	579	495	390	311	215	166
Total, worst case			337		336	
Sun reduction			0,36		0,16	
Oper. time red.			0,88		0,88	
Wind dir. red.			0,60		0,66	
Total reduction			0,19		0,10	
Total, real			66		32	

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** I - Asuinrakennus I, ~Kankaanpääntie 218
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1 09.55	08.59	09.49 (19)	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.13 (19) 09.23		
15.15	16.32	15	10.04 (19)	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	27	09.40 (19) 15.18
2 09.54	08.57	09.48 (19)	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.13 (19) 09.25		
15.17	16.35	18	10.06 (19)	17.55	20.19	21.41	23.02	23.21	22.16	20.40	19.02	16.26	27	09.40 (19) 15.16
3 09.54	08.54	09.47 (19)	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.14 (19) 09.27		
15.18	16.38	21	10.08 (19)	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	27	09.41 (19) 15.15
4 09.53	08.51	09.45 (19)	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.14 (19) 09.29		
15.20	16.40	23	10.08 (19)	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	26	09.40 (19) 15.13
5 09.52	08.49	09.45 (19)	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.14 (19) 09.31		
15.22	16.43	24	10.09 (19)	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	25	09.39 (19) 15.12
6 09.51	08.46	09.45 (19)	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.16 (19) 09.34		
15.24	16.46	25	10.10 (19)	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.49	16.15	23	09.39 (19) 15.11
7 09.50	08.43	09.45 (19)	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.16 (19) 09.36		
15.26	16.49	25	10.10 (19)	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	22	09.38 (19) 15.09
8 09.48	08.40	09.45 (19)	07.15	06.34	05.00	03.49	03.58	05.14	06.37	07.54	08.20	09.17 (19) 09.38		
15.28	16.52	26	10.11 (19)	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	20	09.37 (19) 15.08
9 09.47	08.38	09.44 (19)	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.19 (19) 09.39		
15.30	16.55	27	10.11 (19)	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	18	09.37 (19) 15.07
10 09.46	08.35	09.44 (19)	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.20 (19) 09.41		
15.32	16.58	27	10.11 (19)	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15	09.35 (19) 15.07
11 09.44	08.32	09.44 (19)	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.22 (19) 09.43		
15.35	17.01	27	10.11 (19)	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	10	09.32 (19) 15.06
12 09.43	08.29	09.45 (19)	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.23 (19) 09.44		
15.37	17.04	26	10.11 (19)	18.23	20.46	22.09	23.19	23.07	21.47	20.08	18.30	15.59	9	09.32 (19) 15.05
13 09.41	08.26	09.45 (19)	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.35	09.24 (19) 09.46		
15.40	17.07	25	10.10 (19)	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	8	09.32 (19) 15.05
14 09.39	08.23	09.45 (19)	06.56	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.25 (19) 09.47		
15.42	17.10	25	10.10 (19)	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	7	09.32 (19) 15.04
15 09.38	08.20	09.46 (19)	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.26 (19) 09.49		
15.44	17.13	23	10.09 (19)	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	6	09.32 (19) 15.04
16 09.36	08.17	09.47 (19)	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.27 (19) 09.50		
15.47	17.16	22	10.09 (19)	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	5	09.32 (19) 15.04
17 09.34	08.14	09.48 (19)	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.28 (19) 09.51		
15.50	17.18	18	10.06 (19)	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.14	15.46	4	09.32 (19) 15.03
18 09.32	08.11	09.50 (19)	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.29 (19) 09.52		
15.52	17.21	15	10.05 (19)	18.39	21.02	22.25	23.24	22.55	21.28	19.48	18.11	15.44	3	09.32 (19) 15.03
19 09.30	08.08	09.53 (19)	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.30 (19) 09.53		
15.55	17.24	8	10.01 (19)	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	2	09.32 (19) 15.03
20 09.28	08.05	09.54 (19)	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	09.31 (19) 09.54		
15.58	17.27	7	10.02 (19)	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	1	09.32 (19) 15.04
21 09.26	08.02	09.55 (19)	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.32 (19) 09.55		
16.00	17.30	6	10.03 (19)	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	0	09.32 (19) 15.04
22 09.24	07.59	09.56 (19)	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.33 (19) 09.55		
16.03	17.33	5	10.04 (19)	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	-1	09.32 (19) 15.04
23 09.21	07.56	09.57 (19)	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.34 (19) 09.56		
16.06	17.36	4	10.05 (19)	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	-2	09.32 (19) 15.05
24 09.19	07.53	09.58 (19)	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.35 (19) 09.56		
16.09	17.38	3	10.06 (19)	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	-3	09.32 (19) 15.06
25 09.17	07.50	09.59 (19)	06.20	05.40	04.15	03.42	04.37	06.00	07.20	07.41	08.08	09.36 (19) 09.56		
16.12	17.41	2	10.07 (19)	18.58	21.22	22.43	23.26	22.38	21.06	19.25	16.50	15.28	-4	09.32 (19) 15.06
26 09.14	07.47	09.60 (19)	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	08.10	09.37 (19) 09.56		
16.14	17.44	1	10.08 (19)	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	-5	09.32 (19) 15.07
27 09.12	07.43	09.61 (19)	06.13	05.34	04.11	03.43	04.42	06.05	07.26	07.46	08.13	09.38 (19) 09.56		
16.17	17.47	0	10.09 (19)	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	-6	09.32 (19) 15.08
28 09.10	07.40	09.62 (19)	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	08.16	09.39 (19) 09.56		
16.20	17.50	-1	10.10 (19)	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	-7	09.32 (19) 15.09
29 09.07	07.07	09.63 (19)	05.27	04.07	03.45	04.47	06.10	07.31	07.52	08.19	08.36	09.40 (19) 09.56		
16.23	17.53	-2	10.11 (19)	19.07	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	-8	09.32 (19) 15.10
30 09.05	07.03	09.64 (19)	05.24	04.05	03.46	04.50	06.13	07.33	07.55	08.22	08.39	09.41 (19) 09.56		
16.26	17.54	-3	10.12 (19)	19.08	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	-9	09.32 (19) 15.12
31 09.02	07.00	09.65 (19)	05.21	04.03	03.47	04.52	06.16	07.37	07.57	08.24	08.41	09.42 (19) 09.56		
16.29	17.55	-4	10.13 (19)	19.09	21.36	22.57	23.22	22.22	20.47	19.08	16.32	15.13	-10	09.32 (19) 15.13
Potential sun hours	194	11	09.51 (19)	247	364	443	548	586	579	495	390	311	215	166
Total, worst case	11	09.51 (19)	247	364	443	548	586	579	495	390	311	215	166	
Sun reduction	0,16	0,32	0,48	0,64	0,80	0,96	1,12	1,28	1,44	1,60	1,76	1,92	2,08	2,24
Oper. time red.	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88	0,88
Wind dir. red.	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64	0,64
Total reduction	0,09	0,18	0,27	0,36	0,45	0,54	0,63	0,72	0,81	0,90	0,99	1,08	1,17	1,26
Total, real	1	0,91	0,72	0,53	0,34	0,15	0,06	0,07	0,16	0,25	0,34	0,43	0,52	0,61

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)

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January		February		March		April		May		June	
1	09.55	12.13 (20)	08.59	14.15 (19)	07.37	09.40 (23)	06.57	05.21	04.01			
	15.15	21	12.34 (20)	16.32	37	14.52 (19)	17.52	12	09.52 (23)	20.16	21.38	22.59
2	09.54	12.14 (20)	08.57	14.15 (19)	07.34		06.53	05.18	03.59			
	15.17	21	12.35 (20)	16.35	37	14.52 (19)	17.55		20.19	21.41	23.01	
3	09.53	12.15 (20)	08.54	14.14 (19)	07.31		06.50	05.15	03.57			
	15.18	20	12.35 (20)	16.37	38	14.52 (19)	17.58		20.22	21.44	23.03	
4	09.53	12.15 (20)	08.51	14.14 (19)	07.28		06.47	05.12	03.55			
	15.20	20	12.35 (20)	16.40	38	14.52 (19)	18.01		20.24	21.47	23.05	
5	09.52	12.16 (20)	08.49	14.14 (19)	07.24		07.55 (9)	06.44	05.09	03.54		
	15.22	20	12.36 (20)	16.43	39	14.53 (19)	18.03	9	08.04 (9)	20.27	21.49	23.07
6	09.51	12.17 (20)	08.46	09.42 (23)	07.21		07.52 (9)	06.40	05.06	03.52		
	15.24	19	12.36 (20)	16.46	51	14.53 (19)	18.06	14	08.06 (9)	20.30	21.52	23.09
7	09.50	12.17 (20)	08.43	09.39 (23)	07.18		07.51 (9)	06.37	05.03	03.51		
	15.26	19	12.36 (20)	16.49	58	14.54 (19)	18.09	17	08.08 (9)	20.32	21.55	23.11
8	09.48	12.17 (20)	08.40	09.36 (23)	07.15		07.49 (9)	06.34	05.00	03.49		
	15.28	19	12.36 (20)	16.52	61	14.53 (19)	18.12	19	08.08 (9)	20.35	21.58	23.13
9	09.47	12.18 (20)	08.37	09.35 (23)	07.12		07.48 (9)	06.31	04.57	03.48		
	15.30	18	12.36 (20)	16.55	64	14.53 (19)	18.14	21	08.09 (9)	20.38	22.00	23.14
10	09.46	12.20 (20)	08.35	09.34 (23)	07.08		07.48 (9)	06.27	04.55	03.47		
	15.32	17	12.37 (20)	16.58	65	14.53 (19)	18.17	21	08.09 (9)	20.40	22.03	23.16
11	09.44	12.20 (20)	08.32	09.33 (23)	07.05		07.47 (9)	06.24	04.52	03.46		
	15.35	16	12.36 (20)	17.01	67	14.53 (19)	18.20	21	08.08 (9)	20.43	22.06	23.17
12	09.43	12.21 (20)	08.29	09.32 (23)	07.02		07.47 (9)	06.21	04.49	03.45		
	15.37	15	12.36 (20)	17.04	68	14.52 (19)	18.23	21	08.08 (9)	20.46	22.09	23.18
13	09.41	12.22 (20)	08.26	09.31 (23)	06.59		07.47 (9)	06.18	04.46	03.44		
	15.39	14	12.36 (20)	17.07	67	14.51 (19)	18.25	21	08.08 (9)	20.49	22.12	23.20
14	09.39	12.24 (20)	08.23	09.31 (23)	06.55		07.47 (9)	06.15	04.43	03.43		
	15.42	11	12.35 (20)	17.10	67	14.51 (19)	18.28	20	08.07 (9)	20.51	22.14	23.21
15	09.38	12.25 (20)	08.20	09.31 (23)	06.52		07.48 (9)	06.11	04.41	03.42		
	15.44	9	12.34 (20)	17.13	65	14.50 (19)	18.31	18	08.06 (9)	20.54	22.17	23.22
16	09.36	12.29 (20)	08.17	09.30 (23)	06.49		07.49 (9)	06.08	04.38	03.42		
	15.47	2	12.31 (20)	17.15	64	14.48 (19)	18.33	15	08.04 (9)	20.57	22.20	23.23
17	09.34		08.14	09.30 (23)	06.46		07.50 (9)	06.05	04.35	03.41		
	15.50		17.18	61	14.47 (19)	18.36	11	08.01 (9)	20.59	22.22	23.23	
18	09.32		08.11	09.30 (23)	06.42		06.02	04.33	03.41			
	15.52		17.21	57	14.45 (19)	18.39		21.02	22.25	23.24		
19	09.30		08.08	09.30 (23)	06.39		05.59	04.30	03.41			
	15.55		17.24	53	14.43 (19)	18.41		21.05	22.28	23.25		
20	09.28	14.27 (19)	08.05	09.30 (23)	06.36		05.55	04.27	03.41			
	15.58	4	14.31 (19)	17.27	42	14.38 (19)	18.44		21.08	22.30	23.25	
21	09.26	14.23 (19)	08.02	09.30 (23)	06.33		05.52	04.25	03.41			
	16.00	13	14.36 (19)	17.30	34	10.04 (23)	18.47		21.10	22.33	23.25	
22	09.24	14.21 (19)	07.59	09.31 (23)	06.29		05.49	04.23	03.41			
	16.03	18	14.39 (19)	17.33	33	10.04 (23)	18.49		21.13	22.36	23.26	
23	09.21	14.20 (19)	07.56	09.31 (23)	06.26		05.46	04.20	03.41			
	16.06	21	14.41 (19)	17.35	32	10.03 (23)	18.52		21.16	22.38	23.26	
24	09.19	14.19 (19)	07.53	09.32 (23)	06.23		05.43	04.18	03.42			
	16.09	24	14.43 (19)	17.38	30	10.02 (23)	18.55		21.19	22.41	23.26	
25	09.17	14.18 (19)	07.50	09.33 (23)	06.20		05.40	04.15	03.42			
	16.11	26	14.44 (19)	17.41	28	10.01 (23)	18.57		21.21	22.43	23.25	
26	09.14	14.17 (19)	07.46	09.33 (23)	06.16		05.37	04.13	03.43			
	16.14	29	14.46 (19)	17.44	26	09.59 (23)	19.00		21.24	22.46	23.25	
27	09.12	14.16 (19)	07.43	09.35 (23)	06.13		05.33	04.11	03.43			
	16.17	31	14.47 (19)	17.47	23	09.58 (23)	19.03		21.27	22.48	23.25	
28	09.10	14.16 (19)	07.40	09.37 (23)	06.10		05.30	04.09	03.44			
	16.20	32	14.48 (19)	17.50	19	09.56 (23)	19.05		21.30	22.50	23.24	
29	09.07	14.15 (19)		07.07			05.27	04.07	03.45			
	16.23	34	14.49 (19)		20.08		21.33	22.53	23.24			
30	09.04	14.15 (19)		07.03			05.24	04.04	03.46			
	16.26	35	14.50 (19)		20.11		21.35	22.55	23.23			
31	09.02	14.15 (19)		07.00				04.03				
	16.29	36	14.51 (19)		20.13			22.57				
Potential sun hours	194		247		364		443	547	586			
Total, worst case	564		1324		240							
Sun reduction	0,16		0,32		0,36							
Oper. time red.	0,88		0,88		0,88							
Wind dir. red.	0,67		0,64		0,60							
Total reduction	0,10		0,18		0,19							
Total, real	54		243		46							

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December							
1	03.47	04.55	06.18	07.36	08.26 (9)	08.00	09.04 (23)	09.22	12.02 (20)				
	23.22	22.19	20.44	19.06	22	08.48 (9)	16.29	64	14.22 (19)	15.18	16	12.18 (20)	
2	03.49	04.58	06.21	07.38	08.26 (9)	08.03	09.05 (23)	09.25	12.02 (20)				
	23.21	22.16	20.40	19.02	22	08.48 (9)	16.26	62	14.22 (19)	15.16	17	12.19 (20)	
3	03.50	05.00	06.23	07.41	08.25 (9)	08.06	09.07 (23)	09.27	12.02 (20)				
	23.20	22.13	20.37	18.59	22	08.47 (9)	16.23	60	14.23 (19)	15.15	18	12.20 (20)	
4	03.51	05.03	06.26	07.44	08.25 (9)	08.09	09.09 (23)	09.29	12.02 (20)				
	23.19	22.10	20.34	18.56	21	08.46 (9)	16.20	56	14.23 (19)	15.13	18	12.20 (20)	
5	03.53	05.06	06.29	07.46	08.26 (9)	08.12	09.12 (23)	09.31	12.02 (20)				
	23.18	22.07	20.31	18.53	20	08.46 (9)	16.18	50	14.23 (19)	15.12	19	12.21 (20)	
6	03.54	05.08	06.31	07.49	08.26 (9)	08.14	13.43 (19)	09.33	12.02 (20)				
	23.16	22.04	20.27	18.49	18	08.44 (9)	16.15	40	14.23 (19)	15.11	20	12.22 (20)	
7	03.56	05.11	06.34	07.52	08.27 (9)	08.17	13.44 (19)	09.35	12.03 (20)				
	23.15	22.02	20.24	18.46	16	08.43 (9)	16.12	39	14.23 (19)	15.09	19	12.22 (20)	
8	03.58	05.14	06.36	07.54	08.29 (9)	08.20	13.44 (19)	09.37	12.03 (20)				
	23.14	21.59	20.21	18.43	12	08.41 (9)	16.09	39	14.23 (19)	15.08	20	12.23 (20)	
9	04.00	05.17	06.39	07.57	08.32 (9)	08.23	13.44 (19)	09.39	12.04 (20)				
	23.12	21.56	20.17	18.40	5	08.37 (9)	16.07	38	14.22 (19)	15.07	20	12.24 (20)	
10	04.02	05.19	06.42	08.00		08.26	13.45 (19)	09.41	12.04 (20)				
	23.10	21.53	20.14	18.37		16.04	37	14.22 (19)	15.07	20	12.24 (20)		
11	04.04	05.22	06.44	08.02		08.29	13.46 (19)	09.43	12.04 (20)				
	23.09	21.50	20.11	18.33		16.01	36	14.22 (19)	15.06	20	12.24 (20)		
12	04.06	05.25	06.47	08.05		10.16 (23)	08.32	13.47 (19)	09.44	12.05 (20)			
	23.07	21.47	20.08	18.30	6	10.22 (23)	15.59	35	14.22 (19)	15.05	20	12.25 (20)	
13	04.08	05.27	06.49	08.08		10.11 (23)	08.34	13.47 (19)	09.46	12.05 (20)			
	23.05	21.44	20.04	18.27	16	10.27 (23)	15.56	34	14.21 (19)	15.05	21	12.26 (20)	
14	04.10	05.30	06.52	08.10		10.09 (23)	08.37	13.49 (19)	09.47	12.06 (20)			
	23.03	21.40	20.01	18.24	20	10.29 (23)	15.54	32	14.21 (19)	15.04	20	12.26 (20)	
15	04.12	05.33	06.55	08.13		10.07 (23)	08.40	13.49 (19)	09.49	12.06 (20)			
	23.01	21.37	19.58	18.21	24	10.31 (23)	15.51	31	14.20 (19)	15.04	21	12.27 (20)	
16	04.14	05.36	06.57	08.16		10.05 (23)	08.43	13.50 (19)	09.50	12.06 (20)			
	22.59	21.34	19.55	18.18	28	10.33 (23)	15.49	29	14.19 (19)	15.03	20	12.26 (20)	
17	04.17	05.38	07.00	08.18		10.04 (23)	08.46	13.52 (19)	09.51	12.07 (20)			
	22.57	21.31	19.51	18.14	30	10.34 (23)	15.46	26	14.18 (19)	15.03	20	12.27 (20)	
18	04.19	05.41	07.02	08.21		10.03 (23)	08.49	13.53 (19)	09.52	12.07 (20)			
	22.54	21.28	19.48	18.11	31	10.34 (23)	15.44	24	14.17 (19)	15.03	21	12.28 (20)	
19	04.21	05.44	07.05	08.24		10.02 (23)	08.51	13.55 (19)	09.53	12.07 (20)			
	22.52	21.25	19.45	18.08	33	10.35 (23)	15.41	21	14.16 (19)	15.03	21	12.28 (20)	
20	04.24	05.46	07.07	08.27		10.02 (23)	08.54	13.56 (19)	09.54	12.08 (20)			
	22.50	21.22	19.41	18.05	33	10.35 (23)	15.39	18	14.14 (19)	15.04	21	12.29 (20)	
21	04.26	05.49	07.10	08.29		10.01 (23)	08.57	13.59 (19)	09.54	12.09 (20)			
	22.47	21.19	19.38	18.02	35	10.36 (23)	15.37	13	14.12 (19)	15.04	20	12.29 (20)	
22	04.29	05.52	07.13	08.32		10.01 (23)	08.59	14.03 (19)	09.55	12.09 (20)			
	22.45	21.16	19.35	17.59	46	15.11 (19)	15.35	5	14.08 (19)	15.04	20	12.29 (20)	
23	04.31	05.54	07.15	08.35		10.00 (23)	09.02		09.55	12.10 (20)			
	22.43	21.12	19.32	17.56	55	15.14 (19)	15.33		15.05	20	12.30 (20)		
24	04.34	05.57	07.18	08.38		10.00 (23)	09.05		09.56	12.10 (20)			
	22.40	21.09	19.28	17.53	58	15.16 (19)	15.30		15.05	21	12.31 (20)		
25	04.36	06.00	07.20	07.40		09.00 (23)	09.07		09.56	12.11 (20)			
	22.38	21.06	19.25	16.50	62	14.18 (19)	15.28		15.06	20	12.31 (20)		
26	04.39	06.02	07.23	08.34 (9)	07.43	09.00 (23)	09.10	12.08 (20)	09.56	12.11 (20)			
	22.35	21.03	19.22	9	16.47	65	14.19 (19)	15.26	1	12.09 (20)	15.07	20	12.31 (20)
27	04.42	06.05	07.25	08.31 (9)	07.46	09.00 (23)	09.13	12.05 (20)	09.56	12.12 (20)			
	22.32	21.00	19.19	14	16.44	66	14.20 (19)	15.25	8	12.13 (20)	15.08	20	12.32 (20)
28	04.44	06.08	07.28	08.29 (9)	07.49	09.00 (23)	09.15	12.03 (20)	09.56	12.12 (20)			
	22.30	20.56	19.15	17	16.41	67	14.20 (19)	15.23	12	12.15 (20)	15.09	20	12.32 (20)
29	04.47	06.10	07.31	08.29 (9)	07.52	09.01 (23)	09.18	12.03 (20)	09.56	12.12 (20)			
	22.27	20.53	19.12	18	16.38	68	14.21 (19)	15.21	14	12.17 (20)	15.10	20	12.32 (20)
30	04.50	06.13	07.33	08.27 (9)	07.55	09.02 (23)	09.20	12.03 (20)	09.56	12.13 (20)			
	22.24	20.50	19.09	20	16.35	67	14.22 (19)	15.19	15	12.18 (20)	15.12	20	12.33 (20)
31	04.52	06.16		07.57		09.03 (23)			09.55	12.13 (20)			
	22.22	20.47		16.32	66	14.22 (19)			15.13	21	12.34 (20)		
Potential sun hours	579	495	390	311		215			166				
Total, worst case				78	1034		839		614				
Sun reduction				0,36	0,25		0,16		0,11				
Oper. time red.				0,88	0,88		0,88		0,88				
Wind dir. red.				0,60	0,63		0,66		0,68				
Total reduction				0,19	0,14		0,10		0,07				
Total, real				15	146		81		40				

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: Paholammi_VE2_Shadow_No_Forest_20211129 **Shadow receptor:** K - Asuinrakennus K, ~Seppäkoskentie 36
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

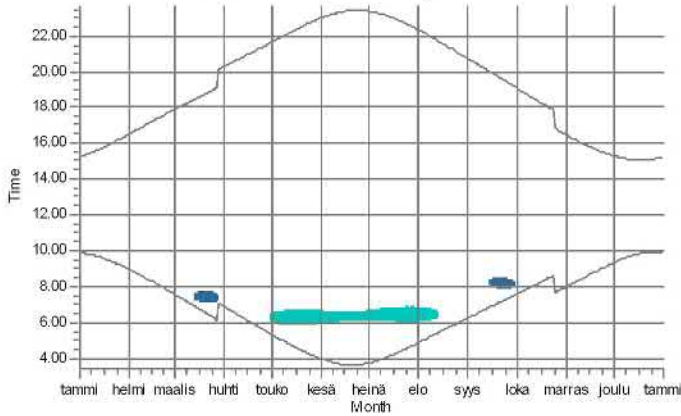
	January	February	March	April	May	June	July	August	September	October	November	December			
1	09.55	11.20 (23)	08.59	07.37	06.57	05.21	04.00	03.47	04.55	06.18	07.36	08.00	09.22	11.04 (23)	
	15.15	21	11.41 (23)	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	43	14.09 (19)
2	09.54	11.20 (23)	08.57	07.34	06.53	05.18	03.59	03.48	04.58	06.21	07.38	08.03	09.25	11.04 (23)	
	15.16	21	11.41 (23)	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	42	14.09 (19)
3	09.53	11.20 (23)	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27	11.06 (23)	
	15.18	22	14.10 (19)	16.37	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	40	14.10 (19)
4	09.53	11.21 (23)	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29	11.06 (23)	
	15.20	25	14.14 (19)	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.20	40	14.10 (19)
5	09.52	11.21 (23)	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31	11.07 (23)	
	15.22	29	14.16 (19)	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	37	14.08 (19)
6	09.51	11.21 (23)	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.34	11.06 (23)	
	15.24	33	14.19 (19)	16.46	18.06	20.30	21.52	23.09	23.17	22.04	20.27	18.49	16.15	34	14.05 (19)
7	09.50	11.22 (23)	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36	11.07 (23)	
	15.26	35	14.22 (19)	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	30	14.03 (19)
8	09.48	11.21 (23)	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37	11.08 (23)	
	15.28	39	14.24 (19)	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	26	14.01 (19)
9	09.47	11.22 (23)	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39	11.09 (23)	
	15.30	41	14.26 (19)	16.55	18.14	20.38	22.00	23.14	23.12	21.56	20.17	18.40	16.07	23	14.00 (19)
10	09.46	11.22 (23)	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41	11.09 (23)	
	15.32	42	14.27 (19)	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	21	11.30 (23)
11	09.44	11.22 (23)	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43	11.10 (23)	
	15.35	43	14.27 (19)	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	21	11.31 (23)
12	09.43	11.23 (23)	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44	11.11 (23)	
	15.37	42	14.28 (19)	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	20	11.31 (23)
13	09.41	11.23 (23)	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46	11.11 (23)	
	15.39	43	14.29 (19)	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	20	11.31 (23)
14	09.39	11.24 (23)	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47	11.12 (23)	
	15.42	44	14.30 (19)	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	3	13.55 (19)
15	09.38	11.24 (23)	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.49	11.13 (23)	
	15.44	44	14.30 (19)	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	10	14.01 (19)
16	09.36	11.24 (23)	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50	11.13 (23)	
	15.47	44	14.30 (19)	17.15	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.17	15.48	13	14.02 (19)
17	09.34	11.25 (23)	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51	11.14 (23)	
	15.49	44	14.31 (19)	17.18	18.36	20.59	22.22	23.23	22.57	21.31	19.51	18.14	15.46	25	14.04 (19)
18	09.32	11.26 (23)	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52	11.14 (23)	
	15.52	43	14.31 (19)	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	32	14.05 (19)
19	09.30	11.26 (23)	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53	11.15 (23)	
	15.55	43	14.31 (19)	17.24	18.41	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	34	14.06 (19)
20	09.28	11.27 (23)	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54	11.15 (23)	
	15.57	40	14.31 (19)	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	36	14.06 (19)
21	09.26	11.28 (23)	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54	11.16 (23)	
	16.00	39	14.31 (19)	17.30	18.47	21.10	22.33	23.25	22.48	21.19	19.38	18.02	15.37	39	14.07 (19)
22	09.24	11.29 (23)	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.13	08.32	09.00	09.55	11.16 (23)	
	16.03	36	14.31 (19)	17.33	18.49	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	41	14.07 (19)
23	09.21	11.30 (23)	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56	11.17 (23)	
	16.06	34	14.31 (19)	17.35	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.32	42	14.08 (19)
24	09.19	11.32 (23)	07.53	06.23	05.43	04.18	03.41	04.34	05.57	07.18	08.38	09.05	09.56	11.18 (23)	
	16.09	31	14.31 (19)	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.30	43	14.08 (19)
25	09.17	11.34 (23)	07.50	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56	11.18 (23)	
	16.11	24	14.30 (19)	17.41	18.57	21.21	22.43	23.25	22.38	21.06	19.25	16.50	15.28	44	14.08 (19)
26	09.14	11.35 (23)	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56	11.18 (23)	
	16.14	13	14.29 (19)	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.26	44	14.09 (19)
27	09.12	11.36 (23)	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.13	09.56	11.18 (23)	
	16.17	10	14.28 (19)	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.24	44	14.09 (19)
28	09.10	11.37 (23)	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56	11.18 (23)	
	16.20	1	14.24 (19)	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	45	14.09 (19)
29	09.07	11.38 (23)	07.37	06.07	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.18	09.56	11.19 (23)	
	16.23			20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10	44	14.10 (19)
30	09.05	11.39 (23)	07.34	06.04	05.24	04.04	03.46	04.49	06.13	07.33	07.55	09.20	09.56	11.19 (23)	
	16.26			20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12	44	14.10 (19)
31	09.02	11.40 (23)	07.31	06.01	05.21	04.02	03.46	04.52	06.16	07.37	07.57	09.22	09.55	11.19 (23)	
	16.29			20.13	21.37	22.57	23.22	22.22	20.47	19.02	16.32	15.17	15.13	20	11.39 (23)
Potential sun hours	194		247	364	443	548	586	579	495	390	311	215	166		
Total, worst case		926										583		724	
Sun reduction		0,16										0,16		0,11	
Oper. time red.		0,88										0,88		0,88	
Wind dir. red.		0,66										0,66		0,66	
Total reduction		0,09										0,10		0,06	
Total, real		86										55		45	

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

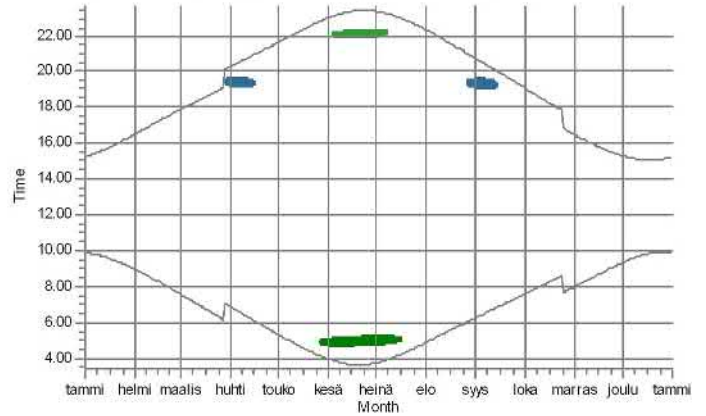
Day in month	Sun rise (hh:mm)	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)	Last time (hh:mm) with flicker	(WTG causing flicker last time)
	Minutes with flicker		

SHADOW - Calendar, graphical**Calculation:** Paholammi_VE2_Shadow_No_Forest_20211129

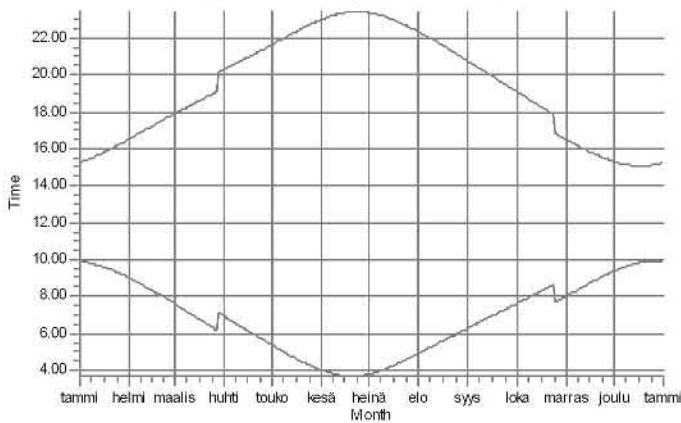
A: Asuinrakennus A, ~Kankaanpääntie 534



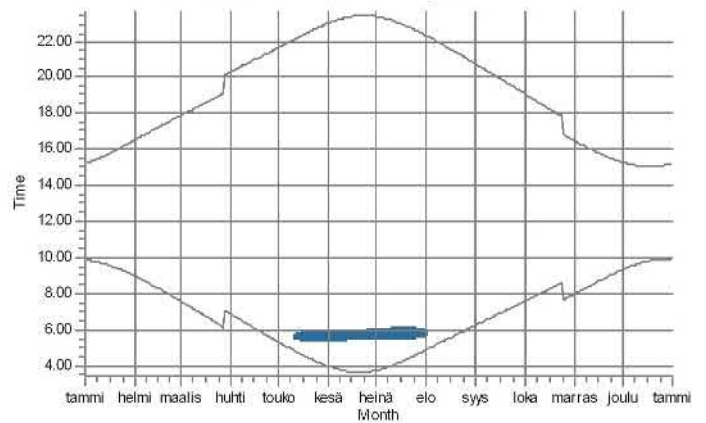
B: Asuinrakennus B, ~Ristiläntie 459



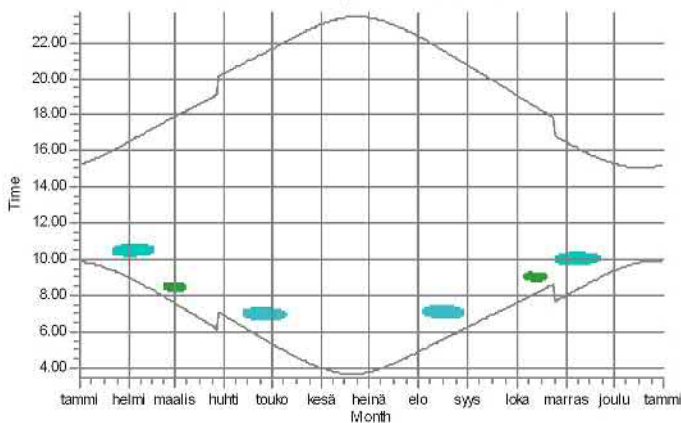
C: Lomarakennus C, ~Variksentie 93



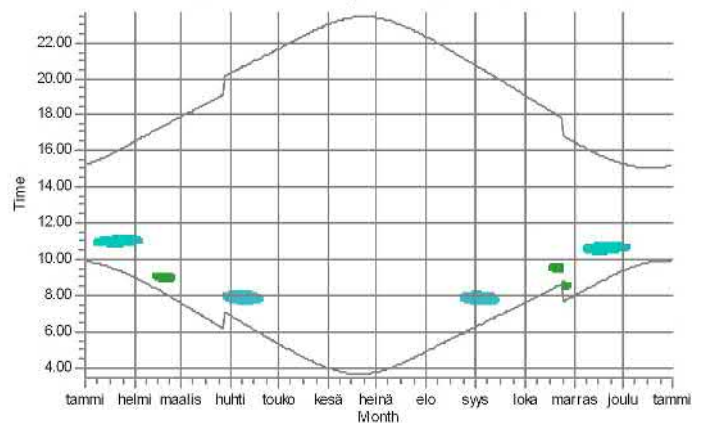
D: Asuinrakennus D, ~Kankaanpääntie 646



E: Asuinrakennus E, ~Välisalontie 130



F: Asuinrakennus F, ~Välisalontie 101



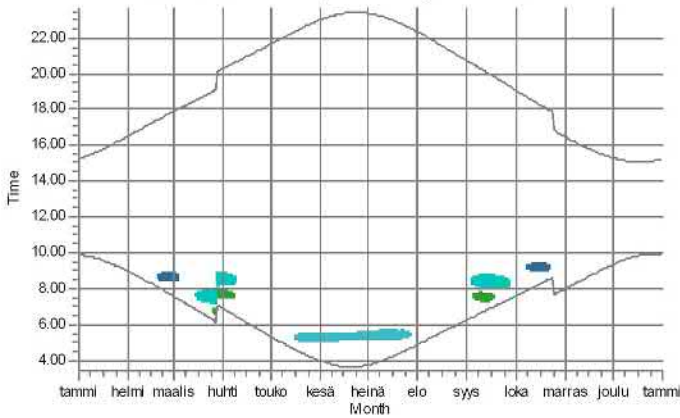
WTGs

- 1: NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712)
- 19: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (730)
- 20: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (731)

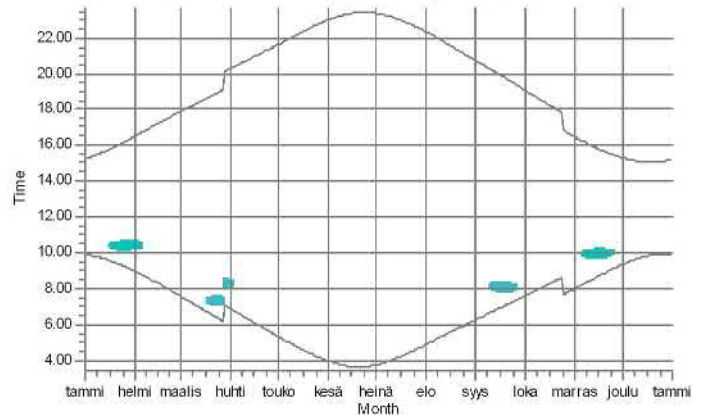
- 21: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (732)
- 22: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (733)

SHADOW - Calendar, graphical**Calculation:** Paholammi_VE2_Shadow_No_Forest_20211129

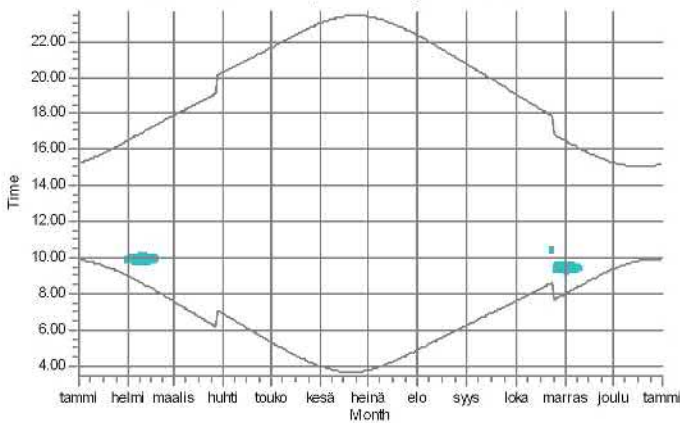
G: Asuinrakennus G, ~Kankaanpääntie 468



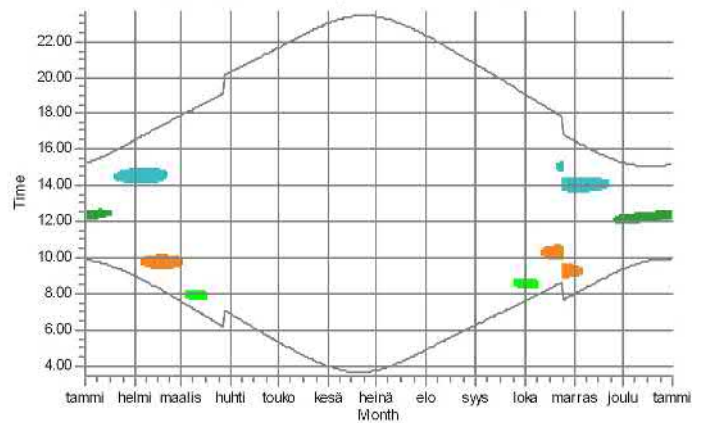
H: Lomarakennus H, ~Kankaanpääntie 320



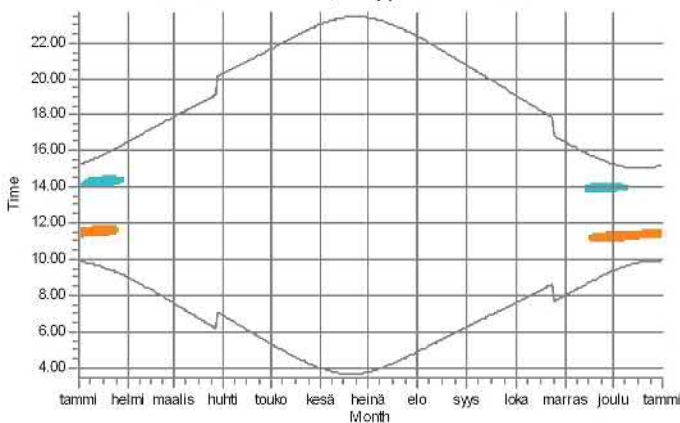
I: Asuinrakennus I, ~Kankaanpääntie 218



J: Asuinrakennus J, ~Penkkinevantie 85



K: Asuinrakennus K, ~Seppäkoskentie 36



WTGs

- 9: NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (720)
- 19: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (730)
- 20: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (731)

- 21: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (732)
- 22: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (733)
- 23: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (734)

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 1 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.54	08.59	07.37	06.57	05.21	04.01	04.49-05.05/16	03.47	04.51-05.14/23	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59		23.22		22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	04.47-05.06/19	03.49	04.51-05.14/23	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01		23.21		22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	04.47-05.06/19	03.50	04.52-05.15/23	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03		23.20		22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	04.47-05.07/20	03.51	04.52-05.14/22	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05		23.19		22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	04.47-05.08/21	03.53	04.52-05.14/22	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07		23.17		22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	04.47-05.08/21	03.55	04.53-05.14/21	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09		23.16		22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	04.47-05.09/22	03.56	04.54-05.14/20	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11		23.15		22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	04.47-05.09/22	03.58	04.54-05.14/20	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12		23.13		21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.47-05.09/22	04.00	04.55-05.14/19	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14		23.12		21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.47-05.09/22	04.02	04.55-05.13/18	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15		23.10		21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.46-05.09/23	04.04	04.56-05.13/17	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17		23.08		21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.47-05.10/23	04.06	04.57-05.12/15	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18		23.06		21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.47-05.10/23	04.08	04.59-05.12/13	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19		23.04		21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.47-05.11/24	04.10	05.01-05.11/10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20		23.02		21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.48-05.11/23	04.12	05.03-05.11/8	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21		23.00		21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.47-05.11/24	04.14	05.04-05.08/4	05.36	06.57	08.16	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22		22.58		21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.47-05.11/24	04.17		05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23		22.56		21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.48-05.12/24	04.19		05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24		22.54		21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.48-05.12/24	04.22		05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24		22.52		21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.48-05.12/24	04.24		05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25		22.49		21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.48-05.12/24	04.26		05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25		22.47		21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.49-05.13/24	04.29		05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25		22.45		21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.49-05.13/24	04.31		05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25		22.42		21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.49-05.13/24	04.34		05.57	07.18	08.37	09.05	09.55
	16.09	17.38	18.55	21.18	22.40	23.25		22.40		21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.49-05.13/24	04.36		06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25		22.37		21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.49-05.13/24	04.39		06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25		22.35		21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	04.56-04.57/1	03.44	04.50-05.13/23	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24		22.32		20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	04.55-05.01/6	03.44	04.50-05.14/24	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24		22.29		20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	04.53-05.02/9	03.45	04.51-05.14/23	04.47	06.10	07.31	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23		22.27		20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	04.51-05.03/12	03.46	04.50-05.13/23	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22		22.24		20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03	04.50-05.04/14		04.52		06.15		07.57		09.55
	16.29		20.13		22.57			22.21		20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586		578		495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	42	677		278		0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 2 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (713)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 3 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (714

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 4 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (715)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 5 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (716

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 6 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (717

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 7 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (718)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 8 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (719)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 9 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (720) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.26-08.48/22	08.00	09.22	
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05		16.29	15.17	
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.26-08.48/22	08.03	09.25	
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02		16.26	15.16	
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.25-08.47/22	08.06	09.27	
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59		16.23	15.14	
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.25-08.46/21	08.09	09.29	
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56		16.20	15.13	
5	09.52	08.48	07.24	07.55-08.04/9	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.26-08.46/20	08.12	09.31
	15.22	16.43	18.03		20.27	21.49	23.07	23.18	22.07	20.30		16.18	15.12	
6	09.50	08.46	07.21	07.52-08.06/14	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.26-08.44/18	08.14	09.33
	15.24	16.46	18.06		20.29	21.52	23.09	23.16	22.04	20.27		16.15	15.10	
7	09.49	08.43	07.18	07.51-08.08/17	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.27-08.43/16	08.17	09.35
	15.26	16.49	18.09		20.32	21.55	23.11	23.15	22.01	20.24		16.12	15.09	
8	09.48	08.40	07.15	07.49-08.08/19	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.29-08.41/12	08.20	09.37
	15.28	16.52	18.12		20.35	21.58	23.12	23.13	21.58	20.21		16.09	15.08	
9	09.47	08.37	07.11	07.48-08.09/21	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.32-08.37/5	08.23	09.39
	15.30	16.55	18.14		20.38	22.00	23.14	23.12	21.55	20.17		16.07	15.07	
10	09.45	08.34	07.08	07.48-08.09/21	06.27	04.55	03.47	04.02	05.19	06.42	07.59		08.26	09.41
	15.32	16.58	18.17		20.40	22.03	23.16	23.10	21.52	20.14		16.04	15.06	
11	09.44	08.32	07.05	07.47-08.08/21	06.24	04.52	03.46	04.04	05.22	06.44	08.02		08.29	09.43
	15.35	17.01	18.20		20.43	22.06	23.17	23.08	21.49	20.11		16.01	15.06	
12	09.43	08.29	07.02	07.47-08.08/21	06.21	04.49	03.45	04.06	05.25	06.47	08.05		08.31	09.44
	15.37	17.04	18.22		20.46	22.09	23.18	23.07	21.46	20.08		15.59	15.05	
13	09.41	08.26	06.59	07.47-08.08/21	06.18	04.46	03.44	04.08	05.27	06.49	08.08		08.34	09.46
	15.39	17.07	18.25		20.48	22.11	23.19	23.05	21.43	20.04		15.56	15.04	
14	09.39	08.23	06.55	07.47-08.07/20	06.14	04.43	03.43	04.10	05.30	06.52	08.10		08.37	09.47
	15.42	17.10	18.28		20.51	22.14	23.21	23.03	21.40	20.01		15.53	15.04	
15	09.37	08.20	06.52	07.48-08.06/18	06.11	04.41	03.42	04.12	05.33	06.54	08.13		08.40	09.48
	15.44	17.12	18.31		20.54	22.17	23.22	23.01	21.37	19.58		15.51	15.04	
16	09.36	08.17	06.49	07.49-08.04/15	06.08	04.38	03.42	04.14	05.35	06.57	08.16		08.43	09.50
	15.47	17.15	18.33		20.57	22.20	23.22	22.59	21.34	19.54		15.48	15.03	
17	09.34	08.14	06.46	07.50-08.01/11	06.05	04.35	03.41	04.17	05.38	07.00	08.18		08.46	09.51
	15.49	17.18	18.36		20.59	22.22	23.23	22.56	21.31	19.51		15.46	15.03	
18	09.32	08.11	06.42		06.02	04.33	03.41	04.19	05.41	07.02	08.21		08.48	09.52
	15.52	17.21	18.39		21.02	22.25	23.24	22.54	21.28	19.48		15.44	15.03	
19	09.30	08.08	06.39		05.58	04.30	03.41	04.21	05.44	07.05	08.24		08.51	09.53
	15.55	17.24	18.41		21.05	22.28	23.24	22.52	21.25	19.45		15.41	15.03	
20	09.28	08.05	06.36		05.55	04.27	03.41	04.24	05.46	07.07	08.27		08.54	09.54
	15.57	17.27	18.44		21.08	22.30	23.25	22.50	21.22	19.41		15.39	15.04	
21	09.26	08.02	06.33		05.52	04.25	03.41	04.26	05.49	07.10	08.29		08.57	09.54
	16.00	17.30	18.47		21.10	22.33	23.25	22.47	21.19	19.38		15.37	15.04	
22	09.23	07.59	06.29		05.49	04.22	03.41	04.29	05.52	07.12	08.32		08.59	09.55
	16.03	17.33	18.49		21.13	22.35	23.25	22.45	21.15	19.35		15.35	15.04	
23	09.21	07.56	06.26		05.46	04.20	03.41	04.31	05.54	07.15	08.35		09.02	09.55
	16.06	17.35	18.52		21.16	22.38	23.25	22.42	21.12	19.32		15.32	15.05	
24	09.19	07.53	06.23		05.43	04.18	03.42	04.34	05.57	07.18	08.38		09.05	09.56
	16.09	17.38	18.55		21.19	22.40	23.25	22.40	21.09	19.28		15.30	15.05	
25	09.17	07.49	06.20		05.40	04.15	03.42	04.36	06.00	07.20	07.40		09.07	09.56
	16.11	17.41	18.57		21.21	22.43	23.25	22.37	21.06	19.25		15.28	15.06	
26	09.14	07.46	06.16		05.36	04.13	03.43	04.39	06.02	07.23	08.34-08.43/9		09.10	09.56
	16.14	17.44	19.00		21.24	22.45	23.25	22.35	21.03	19.22		15.26	15.07	
27	09.12	07.43	06.13		05.33	04.11	03.43	04.42	06.05	07.25	08.31-08.45/14		09.12	09.56
	16.17	17.47	19.03		21.27	22.48	23.25	22.32	20.59	19.18		15.24	15.08	
28	09.09	07.40	06.10		05.30	04.09	03.44	04.44	06.08	07.28	08.29-08.46/17		09.15	09.56
	16.20	17.49	19.05		21.30	22.50	23.24	22.30	20.56	19.15		15.23	15.09	
29	09.07		07.06		05.27	04.07	03.45	04.47	06.10	07.31	08.29-08.47/18		09.17	09.56
	16.23		20.08		21.32	22.53	23.23	22.27	20.53	19.12		15.21	15.10	
30	09.04		07.03		05.24	04.04	03.46	04.50	06.13	07.33	08.27-08.47/20		09.20	09.56
	16.26		20.11		21.35	22.55	23.23	22.24	20.50	19.09		15.19	15.12	
31	09.02		07.00			04.02		04.52	06.15				09.55	
	16.29		20.13			22.57		22.21	20.47				15.13	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166		
Sum of minutes with flicker	0	0	228	0	0	0	0	0	78	158	0	0		

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129WTG: 10 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.16	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.58	03.51	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.28
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.54	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.59	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.10	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.38
	15.31	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.48	04.02	05.20	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.37	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.06
13	09.40	08.25	06.58	06.18	04.46	03.45	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.11	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.16	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.51
	15.53	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.56	04.28	03.42	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.42	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.21	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.15	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.50	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.31	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.14
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 11 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.39	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.01	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 12 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 13 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.49	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 14 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.22	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.39	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 15 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 16 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 17 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.26
	15.19	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 18 - NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.56	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.31	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.26	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.30	04.57	03.48	04.00	05.16	06.39	07.57	08.22	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.39	16.06	15.07
10	09.45	08.34	07.08	06.27	04.54	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.19	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.21	05.43	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.03
20	09.27	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.57	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.22	03.41	04.29	05.51	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.08	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.39	04.15	03.42	04.36	05.59	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.21	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.46	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.07	07.28	07.48	09.14	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.08	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 19 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (730
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59 14.15-14.52/37	07.37	06.57 07.44-08.26/42	05.21 06.44-07.14/30	04.01 05.09-05.31/22
	15.15	16.32 09.49-10.04/15	17.52	20.16	21.38	22.59
2	09.54	08.57 14.15-14.52/37	07.34	06.54 07.43-08.23/40	05.18 06.44-07.13/29	03.59 05.09-05.31/22
	15.17	16.35 09.48-10.06/18	17.55	20.19	21.41	23.01
3	09.53 14.09-14.10/1	08.54 14.14-14.52/38	07.31	06.50 07.41-08.12/31	05.15 06.44-07.12/28	03.57 05.10-05.31/21
	15.18	16.38 09.47-10.08/21	17.58	20.22	21.44	23.03
4	09.53 14.10-14.14/4	08.51 14.14-14.52/38	07.28	06.47 07.41-08.13/32	05.12 06.46-07.11/25	03.55 05.10-05.31/21
	15.20	16.40 09.45-10.08/23	18.01	20.24	21.47	23.05
5	09.52 14.09-14.16/7	08.49 14.14-14.53/39	07.24	06.44 07.40-08.14/34	05.09 06.46-07.10/24	03.54 05.10-05.31/21
	15.22	16.43 09.45-10.09/24	18.03	20.27	21.49	23.07
6	09.51 14.09-14.19/10	08.46 14.14-14.53/39	07.21	06.41 07.38-08.13/35	05.06 06.47-07.08/21	03.52 05.11-05.31/20
	15.24	16.46 09.45-10.10/25	18.06	20.30	21.52	23.09
7	09.49 14.09-14.22/13	08.43 14.14-14.54/40	07.18	06.37 07.38-08.13/35	05.03 06.49-07.06/17	03.51 05.11-05.31/20
	15.26	16.49 09.45-10.10/25	18.09	20.32	21.55	23.11
8	09.48 14.08-14.24/16	08.40 14.14-14.53/39	07.15	06.34 07.38-08.13/35	05.00 06.51-07.04/13	03.49 05.12-05.31/19
	15.28	16.52 09.45-10.11/26	18.12	20.35	21.58	23.13
9	09.47 14.08-14.26/18	08.37 14.14-14.53/39	07.12	06.31 07.37-08.13/36	04.58 06.55-07.00/5	03.48 05.12-05.31/19
	15.30	16.55 09.44-10.11/27	18.14	20.38	22.00	23.14
10	09.46 14.09-14.27/18	08.35 14.15-14.53/38	07.08	06.28 07.37-08.13/36	04.55	03.47 05.12-05.31/19
	15.32	16.58 09.44-10.11/27	18.17	20.40	22.03	23.16
11	09.44 14.08-14.27/19	08.32 14.15-14.53/38	07.05	06.24 07.38-08.12/34	04.52	03.46 05.13-05.31/18
	15.35	17.01 09.44-10.11/27	18.20	20.43	22.06	23.17
12	09.43 14.09-14.28/19	08.29 14.15-14.52/37	07.02	06.21 07.38-08.12/34	04.49	03.45 05.13-05.31/18
	15.37	17.04 09.45-10.11/26	18.23	20.46	22.09	23.18
13	09.41 14.09-14.29/20	08.26 14.16-14.51/35	06.59	06.18 07.38-08.11/33	04.46	03.44 05.14-05.32/18
	15.40	17.07 09.45-10.10/25	18.25	20.49	22.11	23.20
14	09.39 14.09-14.30/21	08.23 14.17-14.51/34	06.55	06.15 07.38-08.09/31	04.43	03.43 05.14-05.31/17
	15.42	17.10 09.45-10.10/25	18.28	20.51	22.14	23.21
15	09.38 14.09-14.30/21	08.20 14.19-14.50/31	06.52	06.11 07.38-08.08/30	04.41	03.43 05.14-05.31/17
	15.44	17.13 09.46-10.09/23	18.31	20.54	22.17	23.22
16	09.36 14.09-14.30/21	08.17 14.19-14.48/29	06.49	06.08 07.39-08.07/28	04.38	03.42 05.15-05.32/17
	15.47	17.15 09.47-10.09/22	18.33	20.57	22.20	23.22
17	09.34 14.10-14.31/21	08.14 14.21-14.47/26	06.46	06.05 07.40-08.05/25	04.35 05.16-05.23/7	03.42 05.14-05.31/17
	15.50	17.18 09.48-10.06/18	18.36	20.59	22.22	23.23
18	09.32 14.10-14.31/21	08.11 14.23-14.45/22	06.42 07.18-07.27/9	06.02 07.41-08.03/22	04.33 05.14-05.25/11	03.41 05.15-05.31/16
	15.52	17.21 09.50-10.05/15	18.39	21.02	22.25	23.24
19	09.30 14.10-14.31/21	08.08 14.26-14.43/17	06.39 07.15-07.30/15	05.59 07.43-08.00/17	04.30 05.12-05.26/14	03.41 05.15-05.31/16
	15.55	17.24 09.53-10.01/8	18.41	21.05	22.28	23.24
20	09.28 14.11-14.31/20	08.05 14.31-14.38/7	06.36 07.13-07.32/19	05.55 07.46-07.57/11	04.28 05.10-05.26/16	03.41 05.15-05.31/16
	15.58	17.27	18.44	21.08	22.30	23.25
21	09.26 14.11-14.36/25	08.02	06.33 07.10-07.32/22	05.52 06.45-07.15/30	04.25 05.10-05.27/17	03.41 05.16-05.32/16
	16.00	17.30	18.47	21.10	22.33	23.25
22	09.24 14.12-14.39/27	07.59	06.29 07.10-07.33/23	05.49 06.44-07.15/31	04.23 05.09-05.28/19	03.41 05.16-05.32/16
	16.03	17.33	18.49	21.13	22.35	23.25
23	09.21 14.13-14.41/28	07.56	06.26 07.09-07.33/24	05.46 06.44-07.16/32	04.20 05.10-05.29/19	03.41 05.16-05.32/16
	16.06	17.35	18.52	21.16	22.38	23.26
24	09.19 14.13-14.43/30	07.53	06.23 07.08-07.34/26	05.43 06.43-07.16/33	04.18 05.09-05.30/21	03.42 05.16-05.32/16
	16.09	17.38	18.55	21.19	22.41	23.25
25	09.17 14.15-14.44/29	07.50	06.20 07.07-07.33/26	05.40 06.44-07.16/32	04.15 05.09-05.30/21	03.42 05.17-05.33/16
	16.12	17.41	18.57	21.21	22.43	23.25
26	09.14 14.16-14.46/30	07.46	06.16 07.07-07.33/26	05.37 06.43-07.16/33	04.13 05.08-05.30/22	03.43 05.17-05.34/17
	16.14	17.44	19.00	21.24	22.45	23.25
27	09.12 14.16-14.47/31	07.43	06.13 07.07-07.33/26	05.34 06.43-07.16/33	04.11 05.08-05.30/22	03.44 05.17-05.33/16
	16.17	17.47	19.03	21.27	22.48	23.25
28	09.09 14.16-14.48/32	07.40	06.10 07.07-07.31/24	05.30 06.43-07.15/32	04.09 05.09-05.31/22	03.44 05.17-05.34/17
	16.20	17.50	19.05	21.30	22.50	23.24
29	09.07 14.15-14.49/34		07.07 08.07-08.31/24	05.27 06.43-07.15/32	04.07 05.08-05.31/23	03.45 05.17-05.35/18
	16.23		20.08 07.52-08.05/13	21.33	22.53	23.24
30	09.04 14.15-14.50/35		07.03 07.49-08.30/41	05.24 06.43-07.14/31	04.05 05.09-05.31/22	03.46 05.17-05.35/18
	16.26		20.11	21.35	22.55	23.23
31	09.02 14.15-14.51/36		07.00 07.47-08.28/41		04.03 05.09-05.31/22	
	16.29 09.51-10.02/11		20.14		22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	639	1080	359	1071	470	540

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 19 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (730
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.47	05.17-05.36/19	04.55		06.18	07.36-08.11/35	07.36		08.00	13.44-14.22/38	09.22	13.50-14.09/19
	23.22		22.19		20.44		19.06		16.29	09.13-09.40/27	15.18	
2	03.49	05.17-05.36/19	04.58		06.21	07.35-08.11/36	07.39		08.03	13.44-14.22/38	09.25	13.51-14.09/18
	23.21		22.16		20.40		19.02		16.26	09.13-09.40/27	15.16	
3	03.50	05.17-05.36/19	05.00		06.23	07.35-08.11/36	07.41		08.06	13.44-14.23/39	09.27	13.53-14.10/17
	23.20		22.13		20.37		18.59		16.23	09.14-09.41/27	15.15	
4	03.51	05.17-05.37/20	05.03	07.03-07.12/9	06.26	07.35-08.10/35	07.44		08.09	13.44-14.23/39	09.29	13.53-14.10/17
	23.19		22.10		20.34		18.56		16.20	09.14-09.40/26	15.13	
5	03.53	05.17-05.37/20	05.06	07.00-07.15/15	06.29	07.35-08.10/35	07.46		08.12	13.44-14.23/39	09.31	13.54-14.08/14
	23.18		22.07		20.31		18.53		16.18	09.14-09.39/25	15.12	
6	03.55	05.17-05.37/20	05.09	06.58-07.16/18	06.31	07.34-08.09/35	07.49		08.14	13.43-14.23/40	09.33	13.54-14.05/11
	23.16		22.04		20.27		18.49		16.15	09.16-09.39/23	15.11	
7	03.56	05.17-05.38/21	05.11	06.57-07.18/21	06.34	07.35-08.09/34	07.52		08.17	13.44-14.23/39	09.35	13.55-14.03/8
	23.15		22.01		20.24		18.46		16.12	09.16-09.38/22	15.10	
8	03.58	05.17-05.38/21	05.14	06.55-07.19/24	06.37	07.35-08.07/32	07.54		08.20	13.44-14.23/39	09.37	13.57-14.01/4
	23.13		21.59		20.21		18.43		16.09	09.17-09.37/20	15.08	
9	04.00	05.17-05.39/22	05.17	06.55-07.21/26	06.39	07.36-08.07/31	07.57		08.23	13.44-14.22/38	09.39	13.58-14.00/2
	23.12		21.56		20.17		18.40		16.07	09.19-09.37/18	15.07	
10	04.02	05.17-05.38/21	05.19	06.53-07.21/28	06.42	07.36-08.16/40	08.00		08.26	13.45-14.22/37	09.41	
	23.10		21.53		20.14		18.37		16.04	09.20-09.35/15	15.07	
11	04.04	05.17-05.39/22	05.22	06.52-07.21/29	06.44	07.37-08.19/42	08.02		08.29	13.46-14.22/36	09.43	
	23.08		21.50		20.11		18.33		16.01	09.22-09.32/10	15.06	
12	04.06	05.18-05.39/21	05.25	06.52-07.22/30	06.47	07.38-08.19/41	08.05		08.32	13.47-14.22/35	09.44	
	23.07		21.47		20.08		18.30		15.59		15.05	
13	04.08	05.17-05.39/22	05.28	06.51-07.22/31	06.49	07.40-08.21/41	08.08		08.34	13.47-14.21/34	09.46	
	23.05		21.44		20.04		18.27		15.56		15.05	
14	04.10	05.17-05.39/22	05.30	06.51-07.23/32	06.52	07.58-08.21/23	08.10		08.37	13.49-14.21/32	09.47	
	23.03		21.40		20.01	07.42-07.57/15	18.24		15.54		15.04	
15	04.12	05.18-05.40/22	05.33	06.50-07.23/33	06.55	07.57-08.22/25	08.13		08.40	13.49-14.20/31	09.49	
	23.01		21.37		19.58	07.47-07.51/4	18.21		15.51		15.04	
16	04.15	05.18-05.40/22	05.36	06.50-07.23/33	06.57	07.56-08.21/25	08.16		08.43	13.49-14.19/30	09.50	
	22.59		21.34		19.55		18.18		15.49		15.04	
17	04.17	05.18-05.40/22	05.38	06.50-07.23/33	07.00	07.56-08.22/26	08.18		08.46	13.48-14.18/30	09.51	
	22.57		21.31		19.51		18.14		15.46		15.03	
18	04.19	05.18-05.39/21	05.41	06.49-07.22/33	07.02	07.55-08.21/26	08.21		08.48	13.47-14.17/30	09.52	
	22.54		21.28		19.48		18.11		15.44		15.03	
19	04.22	05.18-05.39/21	05.44	06.50-07.22/32	07.05	07.55-08.21/26	08.24		08.51	13.48-14.16/28	09.53	
	22.52		21.25		19.45		18.08		15.41		15.04	
20	04.24	05.18-05.38/20	05.46	06.49-07.21/32	07.07	07.54-08.19/25	08.27		08.54	13.47-14.14/27	09.54	
	22.50		21.22		19.41		18.05		15.39		15.04	
21	04.26	05.19-05.38/19	05.49	06.50-07.21/31	07.10	07.55-08.19/24	08.29		08.57	13.47-14.12/25	09.54	
	22.47		21.19		19.38		18.02		15.37		15.04	
22	04.29	05.20-05.39/19	05.52	06.50-07.20/30	07.13	07.55-08.17/22	08.32	15.00-15.11/11	08.59	13.47-14.08/21	09.55	
	22.45		21.16		19.35		17.59		15.35		15.04	
23	04.31	05.21-05.38/17	05.54	07.50-08.02/12	07.15	07.56-08.16/20	08.35	14.55-15.14/19	09.02	13.48-14.08/20	09.55	
	22.43		21.12	06.51-07.19/28	19.32		17.56	10.22-10.33/11	15.33		15.05	
24	04.34	05.22-05.37/15	05.57	07.46-08.04/18	07.18	07.58-08.14/16	08.38	14.53-15.16/23	09.05	13.47-14.08/21	09.56	
	22.40		21.09	06.51-07.18/27	19.28		17.53	10.20-10.35/15	15.31		15.06	
25	04.37	05.23-05.36/13	06.00	07.45-08.07/22	07.20	08.00-08.11/11	07.40	13.51-14.18/27	09.07	13.47-14.08/21	09.56	
	22.37		21.06	06.52-07.17/25	19.25		16.50	09.18-09.37/19	15.29		15.06	
26	04.39	05.25-05.34/9	06.02	07.43-08.08/25	07.23		07.43	13.49-14.19/30	09.10	13.48-14.09/21	09.56	
	22.35		21.03	06.53-07.15/22	19.22		16.47	09.16-09.38/22	15.27		15.07	
27	04.42	05.27-05.32/5	06.05	07.42-08.09/27	07.26		07.46	13.48-14.20/32	09.13	13.48-14.09/21	09.56	
	22.32		21.00	06.56-07.13/17	19.19		16.44	09.15-09.39/24	15.25		15.08	
28	04.44		06.08	07.40-08.10/30	07.28		07.49	13.46-14.20/34	09.15	13.48-14.09/21	09.56	
	22.30		20.56	06.58-07.09/11	19.15		16.41	09.14-09.39/25	15.23		15.09	
29	04.47		06.10	07.38-08.10/32	07.31		07.52	13.45-14.21/36	09.18	13.50-14.10/20	09.56	
	22.27		20.53		19.12		16.38	09.14-09.40/26	15.21		15.11	
30	04.50		06.13	07.38-08.11/33	07.33		07.55	13.46-14.22/36	09.20	13.50-14.10/20	09.56	
	22.24		20.50		19.09		16.35	09.14-09.41/27	15.19		15.12	
31	04.52		06.16	07.37-08.11/34			07.57	13.45-14.22/37			09.55	
	22.21		20.47				16.32	09.14-09.41/27			15.13	
Potential sun hours	579		495		390		311		215		166	
Sum of minutes with flicker	514		883		761		481		1150		110	

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 20 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731) Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 12.13-12.34/21 15.15	08.59 16.32	07.37 08.20-08.41/21 17.52	06.57 07.34-07.53/19 20.16	05.21 21.38	04.01 22.59
2	09.54 12.14-12.35/21 15.17	08.57 16.35	07.34 08.20-08.40/20 17.55	06.54 07.33-07.52/19 20.19	05.18 21.41	03.59 23.01
3	09.53 12.15-12.35/20 15.18	08.54 16.38	07.31 08.20-08.39/19 17.58	06.50 07.33-07.51/18 20.21	05.15 21.44	03.57 23.03
4	09.52 12.15-12.35/20 15.20	08.51 16.40	07.28 08.21-08.39/18 18.01	06.47 07.33-07.51/18 20.24	05.12 21.46	03.55 23.05
5	09.51 12.16-12.36/20 15.22	08.48 16.43	07.24 08.21-08.37/16 18.03	06.44 07.34-07.49/15 20.27	05.09 21.49	03.54 22.01-22.06/5 23.07
6	09.50 12.17-12.36/19 15.24	08.46 16.46	07.21 08.22-08.36/14 18.06	06.40 07.35-07.48/13 20.30	05.06 21.52	03.52 21.59-22.08/9 23.09
7	09.49 12.17-12.36/19 15.26	08.43 16.49	07.18 08.25-08.33/8 18.09	06.37 07.37-07.44/7 20.32	05.03 21.55	03.51 21.58-22.09/11 23.11
8	09.48 12.17-12.36/19 15.28	08.40 16.52	07.15 18.12	06.34 20.35	05.00 21.58	03.50 21.57-22.10/13 23.12
9	09.47 12.18-12.36/18 15.30	08.37 16.55	07.12 18.14	06.31 20.38	04.58 22.00	03.48 21.57-22.11/14 23.14
10	09.45 12.20-12.37/17 15.33	08.34 16.58	07.08 18.17	06.28 20.40	04.55 22.03	03.47 21.56-22.12/16 23.15
11	09.44 12.20-12.36/16 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 21.55-22.12/17 23.17
12	09.42 12.21-12.36/15 15.37	08.29 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 21.56-22.13/17 23.18
13	09.41 12.22-12.36/14 15.40	08.26 09.01-09.08/7 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 21.55-22.13/18 23.19
14	09.39 12.24-12.35/11 15.42	08.23 08.58-09.10/12 17.10	06.55 18.28	06.15 20.51	04.44 22.14	03.43 21.55-22.14/19 23.20
15	09.37 12.25-12.34/9 15.45	08.20 08.55-09.11/16 17.13	06.52 18.31	06.11 20.54	04.41 22.17	03.43 21.56-22.15/19 23.21
16	09.36 12.29-12.31/2 15.47	08.17 08.53-09.11/18 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 21.55-22.15/20 23.22
17	09.34 15.50	08.14 08.53-09.12/19 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 21.55-22.15/20 23.23
18	09.32 15.52	08.11 08.53-09.12/19 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 21.55-22.16/21 23.24
19	09.30 15.55	08.08 08.53-09.13/20 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 21.56-22.16/20 23.24
20	09.28 15.58	08.05 08.52-09.12/20 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 21.56-22.16/20 23.25
21	09.26 16.00	08.02 08.53-09.12/19 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 21.56-22.17/21 23.25
22	09.23 16.03	07.59 08.54-09.11/17 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 21.57-22.17/20 23.25
23	09.21 16.06	07.56 08.54-09.09/15 17.35 08.28-08.35/7	06.26 18.52	05.46 21.16	04.20 22.38	03.42 21.57-22.17/20 23.25
24	09.19 16.09	07.53 08.55-09.08/13 17.38 08.25-08.38/13	06.23 18.55	05.43 21.19	04.18 22.40	03.42 21.56-22.17/21 23.25
25	09.17 16.12	07.50 08.58-09.05/7 17.41 08.23-08.39/16	06.20 18.57	05.40 21.21	04.16 22.43	03.42 21.57-22.18/21 23.25
26	09.14 16.14	07.46 08.22-08.40/18 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 21.57-22.17/20 23.25
27	09.12 16.17	07.43 08.20-08.40/20 17.47	06.13 06.43-06.50/7 19.03	05.34 21.27	04.11 22.48	03.44 21.58-22.18/20 23.24
28	09.09 16.20	07.40 08.20-08.40/20 17.50	06.10 06.39-06.51/12 19.05	05.30 21.30	04.09 22.50	03.44 21.59-22.18/19 23.24
29	09.07 16.23		07.07 07.36-07.52/16 20.08	05.27 21.32	04.07 22.52	03.45 21.59-22.18/19 23.23
30	09.04 16.26		07.03 07.34-07.52/18 20.11	05.24 21.35	04.05 22.55	03.46 21.59-22.17/18 23.23
31	09.02 16.29		07.00 07.34-07.53/19 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	261	296	188	109	0	458

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 20 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December		
1	03.48 21.59-22.17/18	04.55	06.18	07.36	08.00	09.22	12.02-12.18/16	
	23.22	22.19	20.43	19.06	16.29	15.18		
2	03.49 22.00-22.16/16	04.58	06.21	07.38	08.03	09.25	12.02-12.19/17	
	23.21	22.16	20.40	19.02	16.26	15.16		
3	03.50 22.02-22.17/15	05.00	06.23	07.41	08.06	09.27	12.02-12.20/18	
	23.20	22.13	20.37	18.59	16.23	15.15		
4	03.52 22.02-22.16/14	05.03	06.26	07.44	08.09	09.29	12.02-12.20/18	
	23.19	22.10	20.34	18.56	16.21	15.13		
5	03.53 22.03-22.15/12	05.06	06.29 07.34-07.41/7	07.46	08.12	09.31	12.02-12.21/19	
	23.18	22.07	20.30	18.53	16.18	15.12		
6	03.55 22.04-22.14/10	05.09	06.31 07.31-07.43/12	07.49 09.03-09.05/2	08.14	09.33	12.02-12.22/20	
	23.16	22.04	20.27	18.49	16.15	15.11		
7	03.56 22.06-22.13/7	05.11	06.34 07.29-07.45/16	07.52 08.59-09.10/11	08.17	09.35	12.03-12.22/19	
	23.15	22.01	20.24	18.46	16.12	15.10		
8	03.58	05.14	06.36 07.28-07.45/17	07.54 08.57-09.12/15	08.20	09.37	12.03-12.23/20	
	23.13	21.58	20.21	18.43	16.09	15.09		
9	04.00	05.17	06.39 07.27-07.46/19	07.57 08.56-09.13/17	08.23	09.39	12.04-12.24/20	
	23.12	21.55	20.17	18.40	16.07	15.08		
10	04.02	05.19	06.42 07.26-07.45/19	08.00 08.55-09.14/19	08.26	09.41	12.04-12.24/20	
	23.10	21.52	20.14	18.37	16.04	15.07		
11	04.04	05.22	06.44 07.26-07.45/19	08.02 08.53-09.13/20	08.29	09.43	12.04-12.24/20	
	23.08	21.49	20.11	18.33	16.01	15.06		
12	04.06	05.25	06.47 07.25-07.44/19	08.05 08.53-09.13/20	08.31	09.44	12.05-12.25/20	
	23.06	21.46	20.08	18.30	15.59	15.05		
13	04.08	05.28	06.49 07.26-07.44/18	08.08 08.53-09.13/20	08.34	09.46	12.05-12.26/21	
	23.05	21.43	20.04	18.27	15.56	15.05		
14	04.10	05.30	06.52 07.26-07.42/16	08.10 08.53-09.13/20	08.37	09.47	12.06-12.26/20	
	23.03	21.40	20.01	18.24	15.54	15.04		
15	04.12	05.33	06.55 07.29-07.41/12	08.13 08.53-09.12/19	08.40	09.48	12.06-12.27/21	
	23.01	21.37	19.58	18.21	15.51	15.04		
16	04.15	05.36	06.57 07.31-07.39/8	08.16 08.54-09.12/18	08.43	09.50	12.06-12.26/20	
	22.59	21.34	19.55	18.18	15.49	15.04		
17	04.17	05.38	07.00 07.34-07.35/1	08.18 09.29-09.38/9	08.46	09.51	12.07-12.27/20	
	22.56	21.31	19.51	18.14	15.46	15.04		
18	04.19	05.41	07.02	08.21 09.27-09.40/13	08.48	09.52	12.07-12.28/21	
	22.54	21.28	19.48	18.11 08.58-09.09/11	15.44	15.03		
19	04.22	05.44	07.05	08.24 09.25-09.42/17	08.51	09.53	12.07-12.28/21	
	22.52	21.25	19.45	18.08 09.01-09.06/5	15.42	15.04		
20	04.24	05.46	07.07	08.27 09.24-09.42/18	08.54	09.53	12.08-12.29/21	
	22.50	21.22	19.41	18.05	15.39	15.04		
21	04.27	05.49	07.10	08.29 09.24-09.43/19	08.57	09.54	12.09-12.29/20	
	22.47	21.19	19.38	18.02	15.37	15.04		
22	04.29	05.52	07.13	08.32 09.23-09.43/20	08.59	09.55	12.09-12.29/20	
	22.45	21.15	19.35	17.59	15.35	15.05		
23	04.32	05.54	07.15	08.35 09.23-09.43/20	09.02	09.55	12.10-12.30/20	
	22.42	21.12	19.32	17.56	15.33	15.05		
24	04.34	05.57	07.18	08.38 09.23-09.42/19	09.05	09.56	12.10-12.31/21	
	22.40	21.09	19.28	17.53	15.31	15.06		
25	04.37	06.00	07.20	07.40 08.23-08.42/19	09.07	09.56	12.11-12.31/20	
	22.37	21.06	19.25	16.50	15.29	15.06		
26	04.39	06.02	07.23	07.43 08.23-08.41/18	09.10 12.08-12.09/1	09.56	12.11-12.31/20	
	22.35	21.03	19.22	16.47	15.27	15.07		
27	04.42	06.05	07.25	07.46 08.25-08.40/15	09.12 12.05-12.13/8	09.56	12.12-12.32/20	
	22.32	21.00	19.19	16.44	15.25	15.08		
28	04.44	06.08	07.28	07.49 08.28-08.39/11	09.15 12.03-12.15/12	09.56	12.12-12.32/20	
	22.30	20.56	19.15	16.41	15.23	15.09		
29	04.47	06.10	07.31	07.52 08.31-08.37/6	09.17 12.03-12.17/14	09.56	12.12-12.32/20	
	22.27	20.53	19.12	16.38	15.21	15.11		
30	04.50	06.13	07.33	07.54	09.20 12.03-12.18/15	09.56	12.13-12.33/20	
	22.24	20.50	19.09	16.35	15.19	15.12		
31	04.52	06.16		07.57		09.55	12.13-12.34/21	
	22.21	20.47		16.32		15.13		
Potential sun hours	578	495	390	311	215	166		
Sum of minutes with flicker	92	0	183	416	50	614		

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 21 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 10.16-10.46/30 16.32 10.55-11.14/19	07.37 17.52	06.57 08.17-08.52/35 20.16	05.21 06.14-06.26/12 21.38	04.01 06.05-06.36/31 22.59
2	09.54 15.17	08.57 10.16-10.47/31 16.35 10.56-11.13/17	07.34 17.55	06.54 08.17-08.50/33 20.19	05.18 06.11-06.29/18 21.41	03.59 06.05-06.35/30 23.01
3	09.53 15.19	08.54 10.15-10.46/31 16.38 10.57-11.10/13	07.31 17.58	06.50 08.18-08.49/31 20.22	05.15 06.08-06.30/22 21.44	03.57 06.05-06.34/29 23.03
4	09.52 15.20	08.51 10.16-10.47/31 16.41 11.01-11.07/6	07.28 18.01	06.47 08.19-08.48/29 20.24	05.12 06.07-06.32/25 21.46	03.56 06.06-06.34/28 23.05
5	09.51 15.22	08.49 10.16-10.47/31 16.44	07.24 18.03	06.44 08.20-08.46/26 20.27	05.09 06.05-06.33/28 21.49	03.54 06.07-06.34/27 23.07
6	09.50 15.24	08.46 10.17-10.47/30 16.46	07.21 18.06	06.41 08.21-08.44/23 20.30	05.06 06.04-06.34/30 21.52	03.52 06.08-06.34/26 23.09
7	09.49 10.53-10.59/6 15.26	08.43 10.17-10.47/30 16.49	07.18 18.09	06.37 08.22-08.40/18 20.32	05.03 06.03-06.35/32 21.55	03.51 06.08-06.33/25 23.11
8	09.48 10.52-11.02/10 15.28	08.40 10.17-10.46/29 16.52	07.15 18.12	06.34 08.25-08.37/12 20.35	05.01 06.02-06.35/33 21.58	03.50 06.09-06.33/24 23.12
9	09.47 10.51-11.04/13 15.30	08.37 10.18-10.46/28 16.55	07.12 18.14	06.31 20.38	04.58 06.02-06.36/34 22.00	03.48 06.09-06.32/23 23.14
10	09.45 10.51-11.05/14 15.33	08.35 10.19-10.45/26 16.58	07.08 18.17	06.28 20.40	04.55 06.01-06.36/35 22.03	03.47 06.10-06.32/22 23.15
11	09.44 10.49-11.06/17 15.35	08.32 10.20-10.45/25 17.01	07.05 18.20	06.24 20.43	04.52 06.01-06.37/36 22.06	03.46 06.11-06.32/21 23.17
12	09.43 10.49-11.08/19 15.37	08.29 10.21-10.44/23 17.04	07.02 18.23	06.21 20.46	04.49 06.00-06.37/37 22.09	03.45 06.11-06.31/20 23.18
13	09.41 10.49-11.08/19 15.40	08.26 10.22-10.41/19 17.07	06.59 18.25	06.18 20.49	04.46 06.00-06.37/37 22.11	03.44 06.12-06.32/20 23.19
14	09.39 10.49-11.10/21 15.42	08.23 10.24-10.39/15 17.10	06.55 18.28	06.15 20.51	04.44 06.00-06.38/38 22.14	03.43 06.12-06.31/19 23.20
15	09.37 10.48-11.11/23 15.45	08.20 10.28-10.36/8 17.13	06.52 18.31	06.12 20.54	04.41 05.59-06.37/38 22.17	03.43 06.13-06.31/18 23.21
16	09.36 10.48-11.11/23 15.47	08.17 17.16	06.49 07.39-07.41/2 18.33	06.08 20.57	04.38 05.59-06.38/39 22.20	03.42 06.14-06.31/17 23.22
17	09.34 10.25-10.29/4 15.50 10.49-11.13/24	08.14 17.18	06.46 07.32-07.47/15 18.36	06.05 20.59	04.36 06.00-06.38/38 22.22	03.42 06.14-06.30/16 23.23
18	09.32 10.22-10.31/9 15.52 10.48-11.13/25	08.11 17.21	06.43 07.28-07.49/21 18.39	06.02 21.02	04.33 06.00-06.38/38 22.25	03.42 06.14-06.30/16 23.24
19	09.30 10.19-10.32/13 15.55 10.48-11.14/26	08.08 17.24	06.39 07.26-07.51/25 18.41	05.59 21.05	04.30 06.00-06.38/38 22.28	03.41 06.15-06.30/15 23.24
20	09.28 10.17-10.33/16 15.58 10.48-11.14/26	08.05 17.27	06.36 07.24-07.52/28 18.44	05.56 21.08	04.28 06.00-06.38/38 22.30	03.41 06.15-06.30/15 23.25
21	09.26 10.16-10.34/18 16.00 10.48-11.14/26	08.02 17.30	06.33 07.22-07.52/30 18.47	05.52 21.10	04.25 05.59-06.37/38 22.33	03.41 06.16-06.32/16 23.25
22	09.23 10.16-10.35/19 16.03 10.48-11.15/27	07.59 17.33	06.29 07.21-07.53/32 18.50	05.49 21.13	04.23 06.01-06.38/37 22.35	03.41 06.16-06.31/15 23.25
23	09.21 10.16-10.36/20 16.06 10.48-11.15/27	07.56 17.36	06.26 07.20-07.54/34 18.52	05.46 21.16	04.20 06.01-06.38/37 22.38	03.42 06.16-06.31/15 23.25
24	09.19 10.16-10.38/22 16.09 10.49-11.15/26	07.53 17.38	06.23 07.20-07.55/35 18.55	05.43 21.19	04.18 06.01-06.38/37 22.40	03.42 06.16-06.32/16 23.25
25	09.17 10.16-10.40/24 16.12 10.49-11.16/27	07.50 17.41	06.20 07.18-07.54/36 18.58	05.40 21.21	04.16 06.01-06.37/36 22.43	03.42 06.16-06.32/16 23.25
26	09.14 10.16-10.41/25 16.14 10.49-11.16/27	07.46 17.44	06.16 07.18-07.54/36 19.00	05.37 21.24	04.13 06.01-06.37/36 22.45	03.43 06.16-06.33/17 23.25
27	09.12 10.16-10.42/26 16.17 10.50-11.16/26	07.43 17.47	06.13 07.17-07.55/38 19.03	05.34 21.27	04.11 06.02-06.36/34 22.48	03.44 06.16-06.33/17 23.25
28	09.09 10.16-10.43/27 16.20 10.51-11.16/25	07.40 17.50	06.10 07.16-07.53/37 19.06	05.31 21.30	04.09 06.03-06.37/34 22.50	03.45 06.16-06.34/18 23.24
29	09.07 10.16-10.44/28 16.23 10.51-11.16/25	07.37 17.50	07.07 08.16-08.53/37 20.08	05.27 21.33	04.07 06.03-06.36/33 22.52	03.46 06.16-06.35/19 23.23
30	09.04 10.16-10.45/29 16.26 10.52-11.15/23	07.34 17.50	07.03 08.17-08.53/36 20.11	05.24 21.35	04.05 06.04-06.36/32 22.55	03.47 06.16-06.36/20 23.23
31	09.02 10.16-10.45/29 16.29 10.53-11.15/22	07.31 17.50	07.00 08.17-08.52/35 20.14	05.21 21.35	04.03 06.04-06.35/31 22.57	03.47 06.16-06.36/20 23.23
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	856	442	477	207	1031	611

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 21 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48 06.15-06.36/21 23.22	04.55 06.11-06.48/37 22.19	06.18 20.44	07.36 19.06	08.00 09.48-10.15/27 16.29	09.22 10.32-10.48/16 15.18
2	03.49 06.15-06.37/22 23.21	04.58 06.11-06.47/36 22.16	06.21 20.40	07.39 19.02	08.03 09.47-10.15/28 16.26	09.25 10.33-10.48/15 15.16
3	03.50 06.15-06.38/23 23.20	05.01 06.11-06.46/35 22.13	06.24 20.37	07.41 18.59	08.06 09.47-10.16/29 16.23	09.27 10.34-10.47/13 15.15
4	03.52 06.14-06.38/24 23.19	05.03 06.12-06.46/34 22.10	06.26 08.22-08.34/12 20.34	07.44 18.56	08.09 09.47-10.17/30 16.21	09.29 10.36-10.46/10 15.13
5	03.53 06.14-06.39/25 23.18	05.06 06.13-06.45/32 22.07	06.29 08.19-08.37/18 20.31	07.46 18.53	08.12 09.46-10.17/31 16.18	09.31 10.38-10.45/7 15.12
6	03.55 06.13-06.39/26 23.16	05.09 06.13-06.44/31 22.04	06.31 08.16-08.39/23 20.27	07.49 18.49	08.14 09.46-10.16/30 16.15	09.33 15.11
7	03.56 06.14-06.40/26 23.15	05.11 06.14-06.43/29 22.01	06.34 08.15-08.41/26 20.24	07.52 18.46	08.17 09.46-10.17/31 16.12 10.31-10.38/7	09.35 15.10
8	03.58 06.13-06.41/28 23.13	05.14 06.15-06.42/27 21.59	06.37 08.13-08.42/29 20.21	07.54 18.43	08.20 09.46-10.17/31 16.09 10.28-10.41/13	09.37 15.09
9	04.00 06.13-06.42/29 23.12	05.17 06.17-06.41/24 21.56	06.39 08.12-08.43/31 20.18	07.57 18.40	08.23 09.47-10.17/30 16.07 10.27-10.44/17	09.39 15.08
10	04.02 06.12-06.42/30 23.10	05.20 06.18-06.39/21 21.53	06.42 08.10-08.43/33 20.14	08.00 18.37	08.26 09.47-10.17/30 16.04 10.25-10.45/20	09.41 15.07
11	04.04 06.13-06.43/30 23.08	05.22 06.20-06.36/16 21.50	06.44 08.10-08.44/34 20.11	08.02 18.33	08.29 09.47-10.16/29 16.01 10.24-10.46/22	09.43 15.06
12	04.06 06.13-06.44/31 23.07	05.25 06.24-06.33/9 21.47	06.47 08.08-08.44/36 20.08	08.05 18.30	08.32 09.48-10.17/29 15.59 10.24-10.47/23	09.44 15.05
13	04.08 06.12-06.44/32 23.05	05.28 21.43	06.49 08.08-08.44/36 20.04	08.08 18.27	08.34 09.48-10.16/28 15.56 10.23-10.47/24	09.46 15.05
14	04.10 06.12-06.45/33 23.03	05.30 21.40	06.52 08.07-08.44/37 20.01	08.10 18.24	08.37 09.49-10.16/27 15.54 10.23-10.49/26	09.47 15.04
15	04.12 06.12-06.45/33 23.01	05.33 21.37	06.55 08.07-08.44/37 19.58	08.13 18.21	08.40 09.49-10.15/26 15.51 10.23-10.49/26	09.48 15.04
16	04.15 06.12-06.46/34 22.59	05.36 21.34	06.57 08.06-08.43/37 19.55	08.16 18.18	08.43 09.49-10.14/25 15.49 10.22-10.49/27	09.50 15.04
17	04.17 06.12-06.47/35 22.56	05.38 21.31	07.00 08.06-08.43/37 19.51	08.18 18.15	08.46 09.50-10.13/23 15.46 10.23-10.50/27	09.51 15.04
18	04.19 06.10-06.46/36 22.54	05.41 21.28	07.02 08.06-08.42/36 19.48	08.21 18.11	08.48 09.50-10.12/22 15.44 10.23-10.49/26	09.52 15.04
19	04.22 06.10-06.47/37 22.52	05.44 21.25	07.05 08.06-08.42/36 19.45	08.24 18.08	08.51 09.51-10.11/20 15.42 10.23-10.50/27	09.53 15.04
20	04.24 06.10-06.47/37 22.50	05.47 21.22	07.07 08.06-08.40/34 19.42	08.27 18.05	08.54 09.51-10.10/19 15.39 10.23-10.50/27	09.54 15.04
21	04.27 06.10-06.47/37 22.47	05.49 21.19	07.10 08.07-08.39/32 19.38	08.29 18.02	08.57 09.52-10.10/18 15.37 10.24-10.50/26	09.54 15.04
22	04.29 06.11-06.48/37 22.45	05.52 21.16	07.13 08.07-08.38/31 19.35	08.32 17.59	08.59 09.53-10.09/16 15.35 10.24-10.50/26	09.55 15.05
23	04.32 06.10-06.48/38 22.42	05.55 21.12	07.15 08.08-08.36/28 19.32	08.35 17.56	09.02 09.56-10.09/13 15.33 10.25-10.51/26	09.55 15.05
24	04.34 06.10-06.49/39 22.40	05.57 21.09	07.18 08.09-08.35/26 19.28	08.38 17.53	09.05 09.59-10.08/9 15.31 10.25-10.50/25	09.56 15.06
25	04.37 06.10-06.48/38 22.37	06.00 21.06	07.20 08.10-08.32/22 19.25	07.40 16.50	09.07 10.02-10.07/5 15.29 10.26-10.50/24	09.56 15.07
26	04.39 06.10-06.48/38 22.35	06.03 21.03	07.23 08.13-08.30/17 19.22	07.43 16.47	09.10 10.27-10.50/23 15.27	09.56 15.07
27	04.42 06.10-06.48/38 22.32	06.05 21.00	07.26 08.16-08.25/9 19.19	07.46 09.56-10.06/10 16.44	09.12 10.28-10.50/22 15.25	09.56 15.08
28	04.45 06.10-06.49/39 22.30	06.08 20.56	07.28 19.15	07.49 09.53-10.09/16 16.41	09.15 10.28-10.49/21 15.23	09.56 15.10
29	04.47 06.10-06.48/38 22.27	06.10 20.53	07.31 19.12	07.52 09.51-10.11/20 16.38	09.17 10.30-10.50/20 15.21	09.56 15.11
30	04.50 06.10-06.48/38 22.24	06.13 20.50	07.33 19.09	07.55 09.50-10.13/23 16.35	09.20 10.31-10.49/18 15.19	09.56 15.12
31	04.52 06.10-06.47/37 22.21	06.16 20.47	 19.09	07.57 09.49-10.14/25 16.32	 15.19	09.55 15.13
Potential sun hours	578	495	390	311	215	167
Sum of minutes with flicker	1009	331	697	94	1149	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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 22 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June		
1	09.54 15.15	08.59 16.32	07.37 17.52	08.31-08.49/18 17.52	06.57 20.16	19.14-19.35/21 21.38	05.21 21.38	04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 17.55	08.31-08.47/16 17.55	06.54 20.19	19.13-19.36/23 21.41	05.18 21.41	03.59 23.01
3	09.53 15.19	08.54 16.38	07.31 17.58	08.32-08.46/14 17.58	06.50 20.22	19.12-19.37/25 21.44	05.15 21.44	03.57 23.03
4	09.52 15.20	08.51 16.41	07.28 18.01	08.34-08.44/10 18.01	06.47 20.24	19.11-19.38/27 21.46	05.12 21.46	03.56 23.05
5	09.51 15.22	08.48 16.43	07.24 18.03		06.44 20.27	19.09-19.37/28 21.49	05.09 21.49	03.54 23.07
6	09.50 15.24	08.46 16.46	07.21 18.06		06.41 20.30	19.09-19.37/28 21.52	05.06 21.52	03.52 23.09
7	09.49 15.26	08.43 16.49	07.18 18.09		06.37 20.32	19.09-19.37/28 21.55	05.03 21.55	03.51 23.11
8	09.48 15.28	08.40 16.52	07.15 18.12		06.34 20.35	19.09-19.37/28 21.58	05.01 21.58	03.50 23.12
9	09.47 15.30	08.37 16.55	07.12 18.14		06.31 20.38	19.09-19.37/28 22.00	04.58 22.00	03.48 23.14
10	09.45 15.33	08.34 16.58	07.08 18.17		06.28 20.40	19.09-19.36/27 22.03	04.55 22.03	03.47 23.15
11	09.44 15.35	08.32 17.01	07.05 18.20		06.24 20.43	19.09-19.35/26 22.06	04.52 22.06	03.46 23.17
12	09.42 15.37	08.29 17.04	07.02 18.23		06.21 20.46	19.09-19.33/24 22.09	04.49 22.09	03.45 23.18
13	09.41 15.40	08.26 17.07	06.59 18.25		06.18 20.48	19.10-19.32/22 22.11	04.46 22.11	03.44 23.19
14	09.39 15.42	08.23 17.10	06.55 18.28		06.15 20.51	19.11-19.31/20 22.14	04.44 22.14	03.44 23.20
15	09.37 15.45	08.20 17.13	06.52 18.31	07.25-07.36/11	06.11 20.54	19.13-19.29/16 22.17	04.41 22.17	03.43 23.21
16	09.36 15.47	08.17 17.16	06.49 18.33	07.22-07.38/16	06.08 20.57	19.15-19.26/11 22.19	04.38 22.19	03.42 23.22
17	09.34 15.50	08.14 17.18	06.46 18.36	07.21-07.40/19	06.05 20.59		04.36 22.22	03.42 23.23
18	09.32 15.52	08.11 17.21	06.42 18.39	07.19-07.40/21	06.02 21.02		04.33 22.25	03.42 23.24
19	09.30 15.55	08.08 17.24	06.39 18.41	07.18-07.40/22	05.59 21.05		04.30 22.27	03.41 23.24
20	09.28 15.58	08.05 17.27	06.36 18.44	07.18-07.41/23	05.56 21.08		04.28 22.30	03.41 23.25
21	09.26 16.00	08.02 17.30	06.33 18.47	07.17-07.40/23	05.52 21.10	05.28-05.54/26	04.25 22.33	03.41 23.25
22	09.23 16.03	07.59 17.33	06.29 18.49	07.17-07.40/23	05.49 21.13	05.28-05.55/27	04.23 22.35	03.41 23.25
23	09.21 16.06	07.56 17.36	06.26 18.52	07.17-07.40/23	05.46 21.16	05.27-05.55/28	04.20 22.38	03.42 23.25
24	09.19 16.09	07.53 17.38	06.23 18.55	07.17-07.39/22	05.43 21.19	05.27-05.55/28	04.18 22.40	03.42 23.25
25	09.17 16.12	07.50 17.41	06.20 18.57	07.17-07.38/21	05.40 21.21	05.27-05.55/28	04.16 22.43	03.43 23.25
26	09.14 16.14	07.46 17.44	06.16 19.00	07.18-07.36/18	05.37 21.24	05.27-05.55/28	04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 17.47	06.13 19.03	07.19-07.35/16	05.34 21.27	05.27-05.55/28	04.11 22.48	03.44 23.24
28	09.09 16.20	07.40 17.50	06.10 19.05	07.20-07.31/11	05.31 21.30	05.27-05.55/28	04.09 22.50	03.45 23.24
29	09.07 16.23		07.07 20.08	19.23-19.28/5	05.27 21.32	05.27-05.55/28	04.07 22.52	03.46 23.23
30	09.04 16.26		07.03 20.11	19.19-19.32/13	05.24 21.35	05.28-05.56/28	04.05 22.55	03.47 23.23
31	09.02 16.29		07.00 20.13	19.17-19.35/18		05.28-05.55/27	04.03 22.57	
Potential sun hours	194	247	364	443	547	586	693	
Sum of minutes with flicker	0	154	363	382	477	693		

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 22 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.48	05.36-06.00/24	04.55	05.50-05.53/3	06.18	19.08-19.34/26	07.36		08.00		09.22	
	23.22		22.19		20.43		19.06		16.29		15.18	
2	03.49	05.36-06.00/24	04.58		06.21	19.07-19.34/27	07.38		08.03		09.24	
	23.21		22.16		20.40		19.02		16.26		15.16	
3	03.50	05.36-06.00/24	05.01		06.24	19.07-19.35/28	07.41		08.06		09.27	
	23.20		22.13		20.37		18.59		16.23		15.15	
4	03.52	05.36-06.01/25	05.03		06.26	19.06-19.34/28	07.44		08.09		09.29	
	23.19		22.10		20.34		18.56		16.21		15.13	
5	03.53	05.36-06.01/25	05.06		06.29	19.06-19.34/28	07.46		08.11		09.31	
	23.17		22.07		20.30		18.53		16.18		15.12	
6	03.55	05.37-06.02/25	05.09		06.31	19.05-19.33/28	07.49		08.14		09.33	
	23.16		22.04		20.27		18.49		16.15		15.11	
7	03.57	05.36-06.02/26	05.11		06.34	19.05-19.33/28	07.52		08.17		09.35	
	23.15		22.01		20.24		18.46		16.12		15.10	
8	03.58	05.36-06.02/26	05.14		06.37	19.05-19.32/27	07.54		08.20		09.37	
	23.13		21.58		20.21		18.43		16.09		15.09	
9	04.00	05.36-06.03/27	05.17		06.39	19.05-19.31/26	07.57	09.11-09.16/5	08.23		09.39	
	23.12		21.55		20.17		18.40		16.07		15.08	
10	04.02	05.36-06.03/27	05.20		06.42	19.06-19.30/24	08.00	09.08-09.20/12	08.26		09.41	
	23.10		21.52		20.14		18.37		16.04		15.07	
11	04.04	05.36-06.03/27	05.22		06.44	19.06-19.28/22	08.02	09.05-09.20/15	08.29		09.42	
	23.08		21.49		20.11		18.33		16.01		15.06	
12	04.06	05.36-06.04/28	05.25		06.47	19.08-19.26/18	08.05	09.04-09.22/18	08.31		09.44	
	23.06		21.46		20.08		18.30		15.59		15.05	
13	04.08	05.36-06.03/27	05.28		06.49	19.09-19.23/14	08.08	09.03-09.22/19	08.34		09.46	
	23.05		21.43		20.04		18.27		15.56		15.05	
14	04.10	05.36-06.04/28	05.30		06.52	19.13-19.20/7	08.10	09.03-09.23/20	08.37		09.47	
	23.03		21.40		20.01		18.24		15.54		15.04	
15	04.12	05.36-06.04/28	05.33		06.55	08.11-08.21/10	08.13	09.02-09.23/21	08.40		09.48	
	23.01		21.37		19.58		18.21		15.51		15.04	
16	04.15	05.36-06.05/29	05.36		06.57	08.08-08.23/15	08.16	09.02-09.23/21	08.43		09.50	
	22.58		21.34		19.55		18.18		15.49		15.04	
17	04.17	05.37-06.05/28	05.38		07.00	08.07-08.25/18	08.18	09.02-09.22/20	08.46		09.51	
	22.56		21.31		19.51		18.14		15.46		15.04	
18	04.19	05.37-06.05/28	05.41		07.02	08.05-08.25/20	08.21	09.02-09.22/20	08.48		09.52	
	22.54		21.28		19.48		18.11		15.44		15.04	
19	04.22	05.36-06.04/28	05.44		07.05	08.04-08.26/22	08.24	09.03-09.21/18	08.51		09.53	
	22.52		21.25		19.45		18.08		15.42		15.04	
20	04.24	05.36-06.04/28	05.46		07.07	08.03-08.25/22	08.27	09.04-09.20/16	08.54		09.53	
	22.50		21.22		19.41		18.05		15.39		15.04	
21	04.27	05.37-06.05/28	05.49		07.10	08.02-08.26/24	08.29	09.07-09.18/11	08.57		09.54	
	22.47		21.19		19.38		18.02		15.37		15.04	
22	04.29	05.38-06.04/26	05.52		07.13	08.01-08.25/24	08.32	09.10-09.15/5	08.59		09.55	
	22.45		21.15		19.35		17.59		15.35		15.05	
23	04.32	05.38-06.04/26	05.55		07.15	08.02-08.25/23	08.35		09.02		09.55	
	22.42		21.12		19.32		17.56		15.33		15.05	
24	04.34	05.38-06.04/26	05.57		07.18	08.02-08.24/22	08.38		09.05		09.56	
	22.40		21.09		19.28		17.53		15.31		15.06	
25	04.37	05.39-06.03/24	06.00		07.20	08.02-08.23/21	07.40		09.07		09.56	
	22.37		21.06		19.25		16.50		15.29		15.07	
26	04.39	05.39-06.02/23	06.02		07.23	08.03-08.22/19	07.43		09.10		09.56	
	22.35		21.03		19.22		16.47		15.27		15.07	
27	04.42	05.40-06.01/21	06.05	19.17-19.28/11	07.25	08.03-08.20/17	07.46		09.12		09.56	
	22.32		21.00		19.19		16.44		15.25		15.08	
28	04.45	05.41-06.01/20	06.08	19.14-19.31/17	07.28	08.05-08.18/13	07.49		09.15		09.56	
	22.29		20.56		19.15		16.41		15.23		15.10	
29	04.47	05.42-06.00/18	06.10	19.12-19.32/20	07.31	08.08-08.15/7	07.52		09.17		09.56	
	22.27		20.53		19.12		16.38		15.21		15.11	
30	04.50	05.43-05.58/15	06.13	19.11-19.33/22	07.33		07.54		09.20		09.55	
	22.24		20.50		19.09		16.35		15.19		15.12	
31	04.52	05.45-05.56/11	06.16	19.09-19.33/24			07.57				09.55	
	22.21		20.47				16.32				15.13	
Potential sun hours	578		495		390		311		215		167	
Sum of minutes with flicker	770		97		608		221		0		0	

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129**WTG:** 23 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (734)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 11.20-11.41/21 15.15	08.59 16.32	07.37 09.40-09.52/12 17.52	06.57 20.16	05.21 21.38	04.01 22.59
2	09.54 11.20-11.41/21 15.17	08.57 16.35	07.34 17.55	06.53 20.19	05.18 21.41	03.59 23.01
3	09.53 11.20-11.41/21 15.18	08.54 16.37	07.31 17.58	06.50 20.21	05.15 21.44	03.57 23.03
4	09.52 11.21-11.42/21 15.20	08.51 16.40	07.27 18.01	06.47 20.24	05.12 21.46	03.55 23.05
5	09.52 11.21-11.43/22 15.22	08.49 16.43	07.24 18.03	06.44 20.27	05.09 21.49	03.54 23.07
6	09.50 11.21-11.44/23 15.24	08.46 09.42-09.54/12 16.46	07.21 18.06	06.40 20.30	05.06 21.52	03.52 23.09
7	09.49 11.22-11.44/22 15.26	08.43 09.39-09.57/18 16.49	07.18 18.09	06.37 20.32	05.03 21.55	03.51 23.11
8	09.48 11.21-11.44/23 15.28	08.40 09.36-09.58/22 16.52	07.15 18.12	06.34 20.35	05.00 21.58	03.49 23.12
9	09.47 11.22-11.45/23 15.30	08.37 09.35-10.00/25 16.55	07.12 18.14	06.31 20.38	04.57 22.00	03.48 23.14
10	09.46 11.22-11.46/24 15.32	08.35 09.34-10.01/27 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.16
11	09.44 11.22-11.46/24 15.35	08.32 09.33-10.02/29 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17
12	09.43 11.23-11.46/23 15.37	08.29 09.32-10.03/31 17.04	07.02 18.22	06.21 20.46	04.49 22.09	03.45 23.18
13	09.41 11.23-11.46/23 15.39	08.26 09.31-10.03/32 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19
14	09.39 11.24-11.47/23 15.42	08.23 09.31-10.04/33 17.10	06.55 18.28	06.15 20.51	04.43 22.14	03.43 23.21
15	09.37 11.24-11.47/23 15.44	08.20 09.31-10.05/34 17.12	06.52 18.31	06.11 20.54	04.41 22.17	03.42 23.22
16	09.36 11.24-11.47/23 15.47	08.17 09.30-10.05/35 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 23.22
17	09.34 11.25-11.48/23 15.50	08.14 09.30-10.05/35 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 23.23
18	09.32 11.26-11.48/22 15.52	08.11 09.30-10.05/35 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24
19	09.30 11.26-11.48/22 15.55	08.08 09.30-10.06/36 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 23.24
20	09.28 11.27-11.47/20 15.58	08.05 09.30-10.05/35 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 23.25
21	09.26 11.28-11.47/19 16.00	08.02 09.30-10.04/34 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 11.29-11.46/17 16.03	07.59 09.31-10.04/33 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 11.30-11.46/16 16.06	07.56 09.31-10.03/32 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25
24	09.19 11.32-11.45/13 16.09	07.53 09.32-10.02/30 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 11.34-11.43/9 16.11	07.49 09.33-10.01/28 17.41	06.20 18.57	05.40 21.21	04.15 22.43	03.42 23.25
26	09.14 16.14	07.46 09.33-09.59/26 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 09.35-09.58/23 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.25
28	09.09 16.20	07.40 09.37-09.56/19 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24
29	09.07 16.23		07.06 20.08	05.27 21.32	04.07 22.52	03.45 23.23
30	09.04 16.26		07.03 20.11	05.24 21.35	04.05 22.55	03.46 23.23
31	09.02 16.29		07.00 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	521	664	12	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 23 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (734)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.47 23.22	04.55 22.19	06.18 20.43	07.36 19.05	08.00 16.29	09.04-09.30/26 15.18
2	03.49 23.21	04.58 22.16	06.21 20.40	07.38 19.02	08.03 16.26	09.05-09.29/24 15.16
3	03.50 23.20	05.00 22.13	06.23 20.37	07.41 18.59	08.06 16.23	09.07-09.28/21 15.15
4	03.51 23.19	05.03 22.10	06.26 20.34	07.44 18.56	08.09 16.20	09.09-09.26/17 15.13
5	03.53 23.18	05.06 22.07	06.29 20.30	07.46 18.53	08.12 16.18	09.12-09.23/11 15.12
6	03.55 23.16	05.08 22.04	06.31 20.27	07.49 18.49	08.14 16.15	09.33 15.11
7	03.56 23.15	05.11 22.01	06.34 20.24	07.52 18.46	08.17 16.12	09.35 15.09
8	03.58 23.13	05.14 21.58	06.36 20.21	07.54 18.43	08.20 16.09	09.37 15.08
9	04.00 23.12	05.17 21.55	06.39 20.17	07.57 18.40	08.23 16.07	09.39 15.07
10	04.02 23.10	05.19 21.53	06.42 20.14	08.00 18.36	08.26 16.04	09.41 15.07
11	04.04 23.08	05.22 21.49	06.44 20.11	08.02 18.33	08.29 16.01	09.43 15.06
12	04.06 23.07	05.25 21.46	06.47 20.08	08.05 18.30	08.31 15.59	09.44 15.05
13	04.08 23.05	05.27 21.43	06.49 20.04	08.08 18.27	08.34 15.56	09.46 15.05
14	04.10 23.03	05.30 21.40	06.52 20.01	08.10 18.24	08.37 15.54	09.47 15.04
15	04.12 23.01	05.33 21.37	06.54 19.58	08.13 18.21	08.40 15.51	09.48 15.04
16	04.14 22.59	05.36 21.34	06.57 19.54	08.16 18.17	08.43 15.49	09.50 15.03
17	04.17 22.56	05.38 21.31	07.00 19.51	08.18 18.14	08.46 15.46	09.51 15.03
18	04.19 22.54	05.41 21.28	07.02 19.48	08.21 18.11	08.48 15.44	09.52 15.03
19	04.21 22.52	05.44 21.25	07.05 19.45	08.24 18.08	08.51 15.41	09.53 15.03
20	04.24 22.50	05.46 21.22	07.07 19.41	08.27 18.05	08.54 15.39	09.54 15.04
21	04.26 22.47	05.49 21.19	07.10 19.38	08.29 18.02	08.57 15.37	09.54 15.04
22	04.29 22.45	05.52 21.15	07.12 19.35	08.32 17.59	08.59 15.35	09.55 15.04
23	04.31 22.42	05.54 21.12	07.15 19.32	08.35 17.56	09.02 15.33	09.55 15.05
24	04.34 22.40	05.57 21.09	07.18 19.28	08.38 17.53	09.05 15.30	09.56 15.06
25	04.36 22.37	06.00 21.06	07.20 19.25	07.40 16.50	09.07 15.28	09.56 15.06
26	04.39 22.35	06.02 21.03	07.23 19.22	07.43 16.47	09.10 15.26	09.56 15.07
27	04.42 22.32	06.05 21.00	07.25 19.19	07.46 16.44	09.12 15.25	09.56 15.08
28	04.44 22.30	06.08 20.56	07.28 19.15	07.49 16.41	09.15 15.23	09.56 15.09
29	04.47 22.27	06.10 20.53	07.31 19.12	07.52 16.38	09.17 15.21	09.56 15.10
30	04.50 22.24	06.13 20.50	07.33 19.09	07.54 16.35	09.20 15.19	09.56 15.12
31	04.52 22.21	06.16 20.47		07.57 16.32	09.03-09.32/29	09.55 15.13
Potential sun hours	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	591	380	614

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129 **WTG:** 24 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (735)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.06	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.46
	15.40	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.04
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.49	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

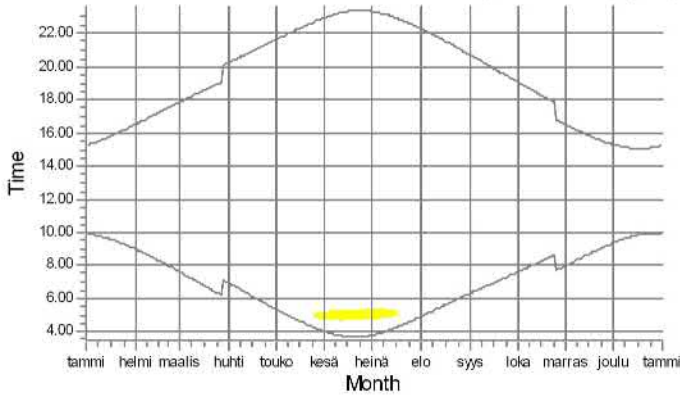
Table layout: For each day in each month the following matrix apply

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

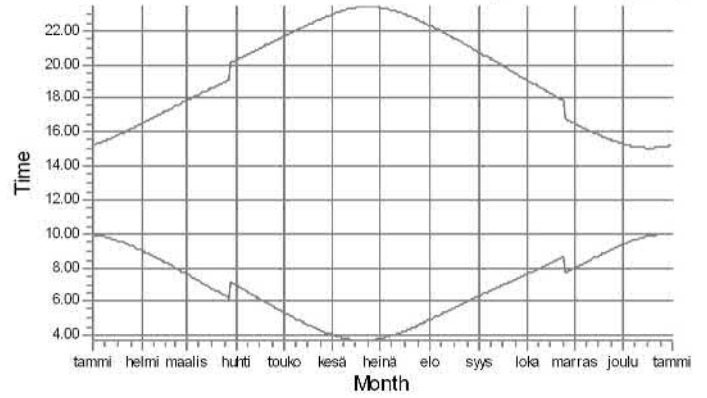
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129

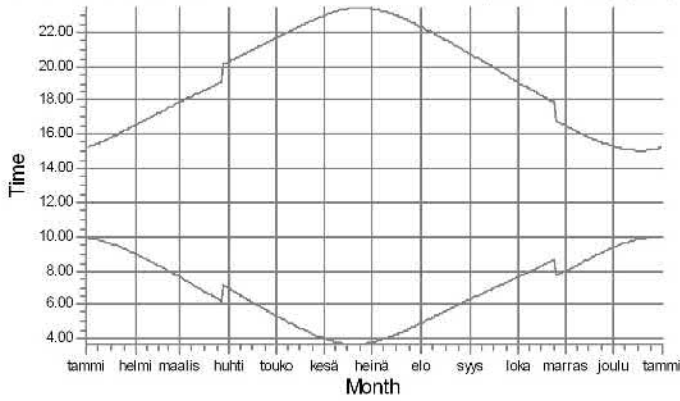
1: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (712)



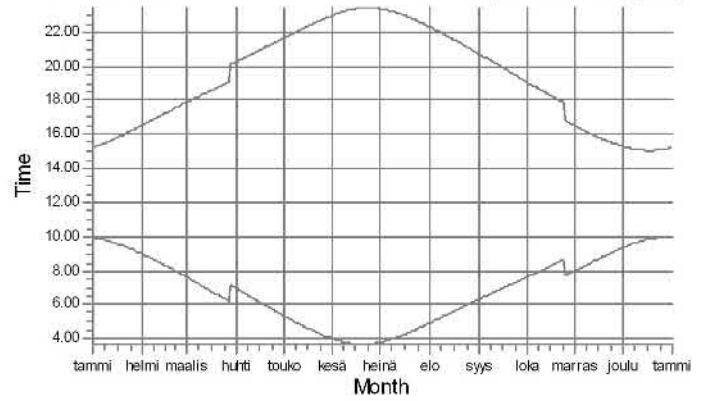
2: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (713)



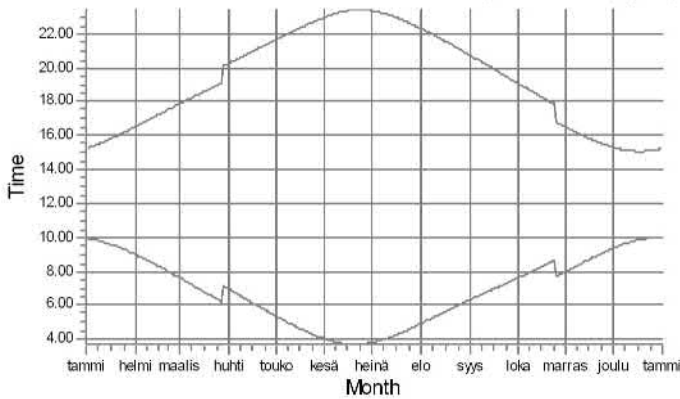
3: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (714)



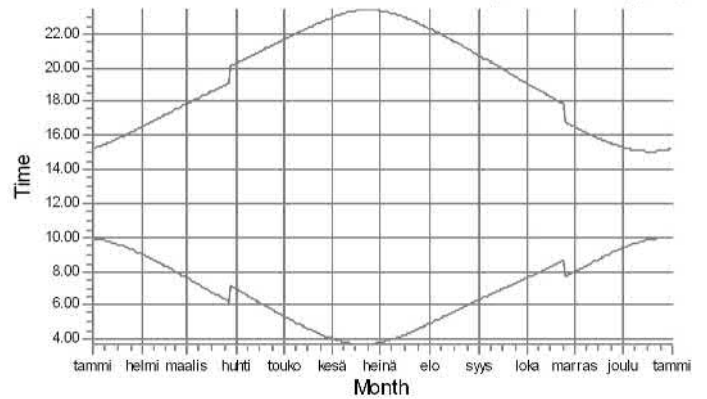
4: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (715)



5: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (716)



6: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (717)



Shadow receptors

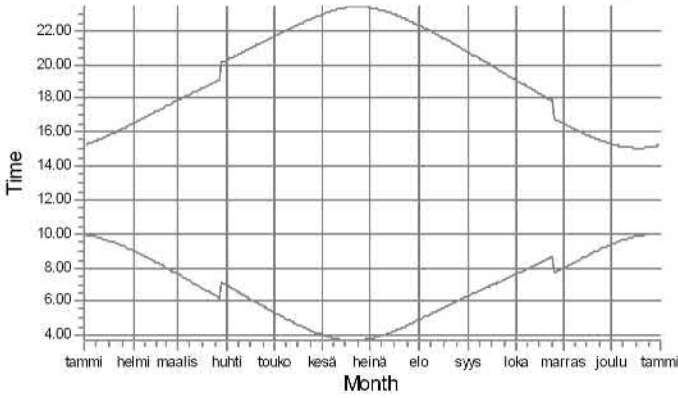


B: Asuinrakennus B, ~Ristoläntie 459

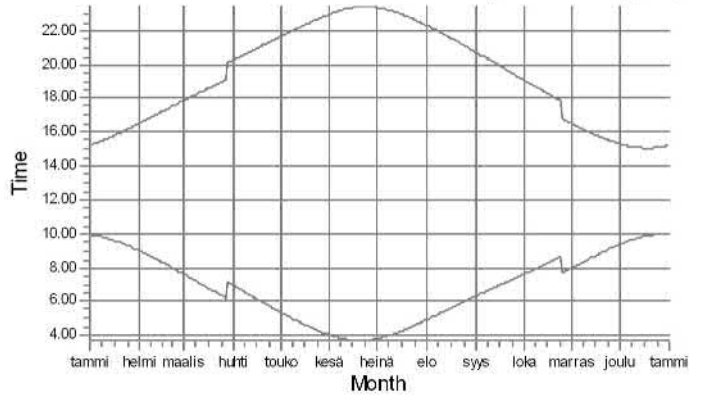
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129

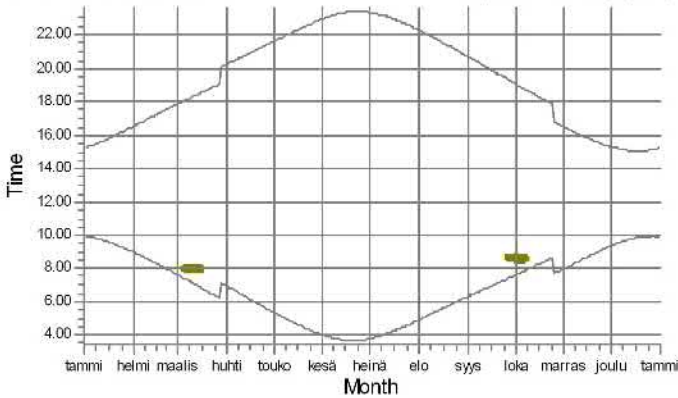
7: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (718)



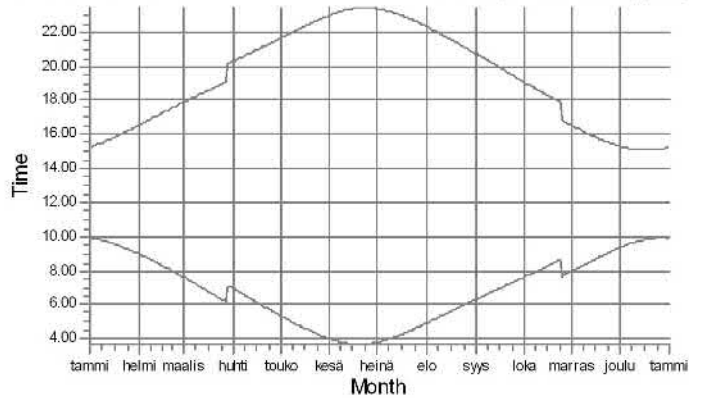
8: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (719)



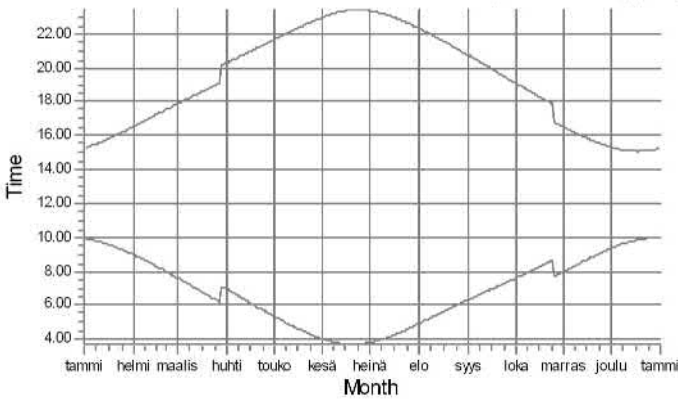
9: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (720)



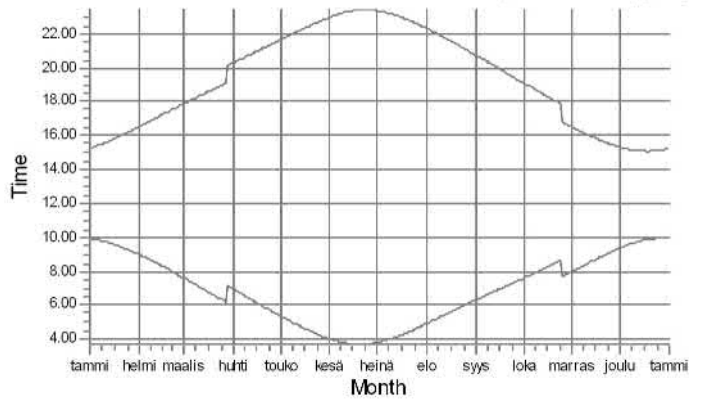
10: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (721)



11: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (722)



12: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (723)



Shadow receptors

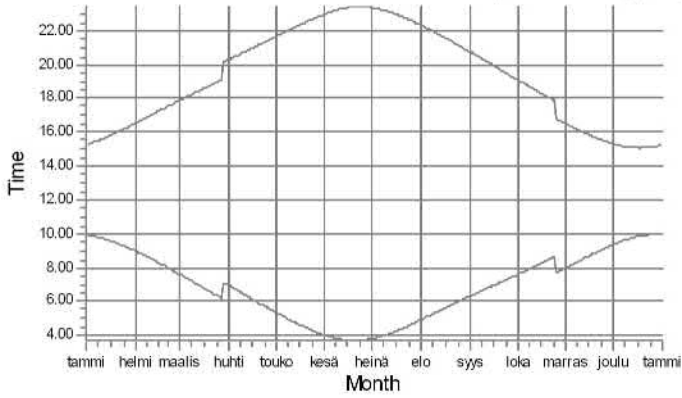


J: Asuinrakennus J, ~Penkkinevantie 85

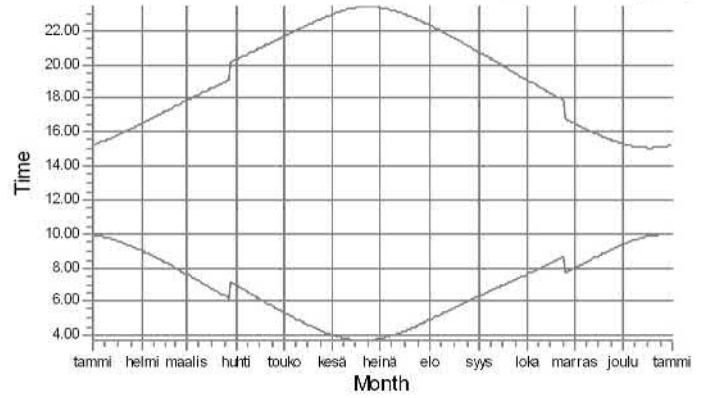
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129

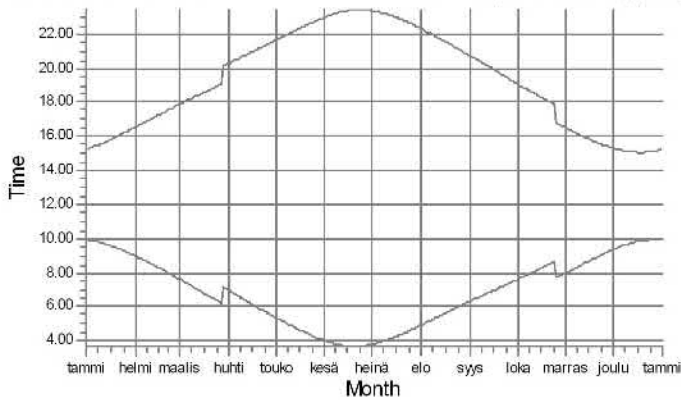
13: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (724



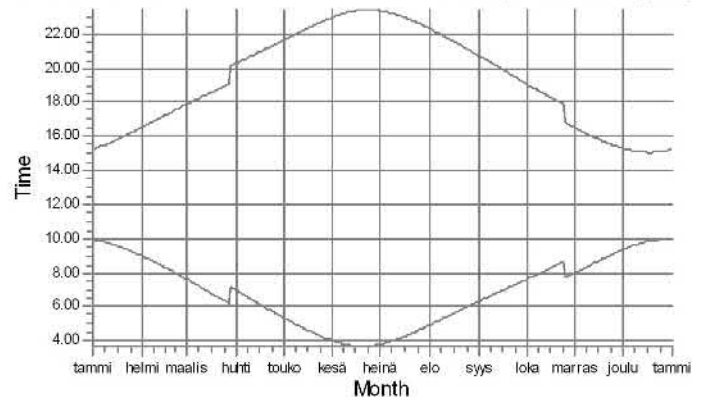
14: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (725



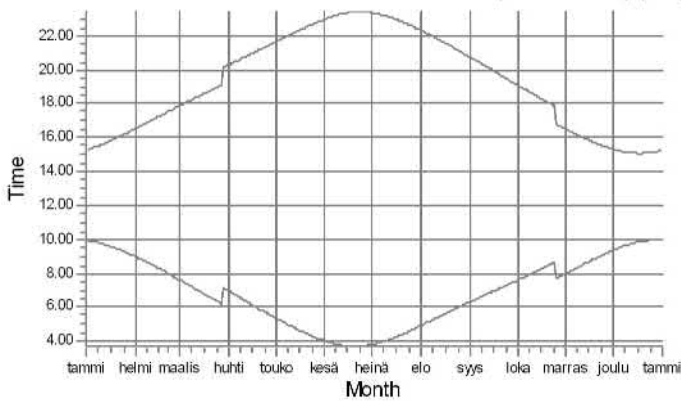
15: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (726



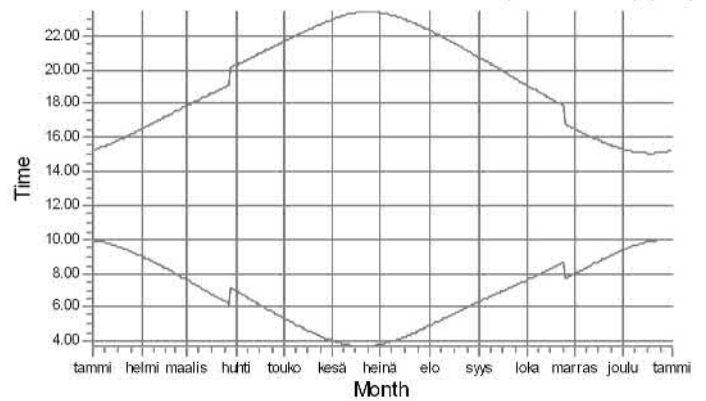
16: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (727



17: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (728



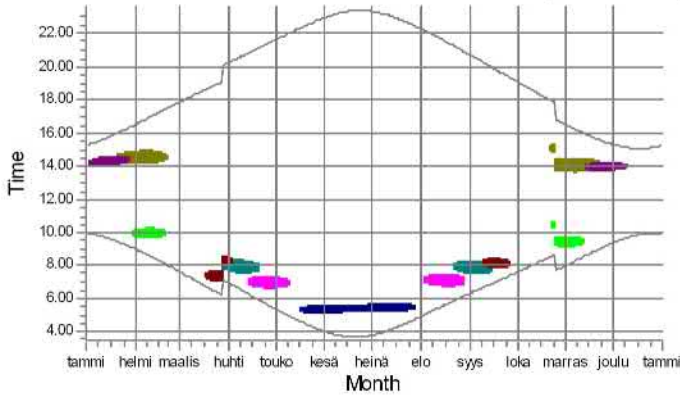
18: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (729



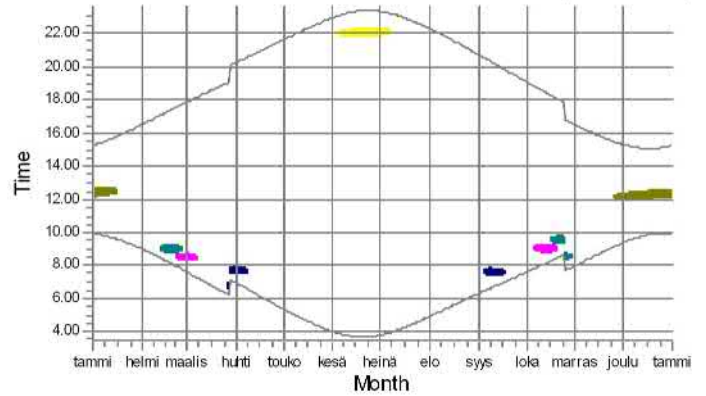
Shadow receptors

SHADOW - Calendar per WTG, graphical**Calculation:** Paholammi_VE2_Shadow_No_Forest_20211129

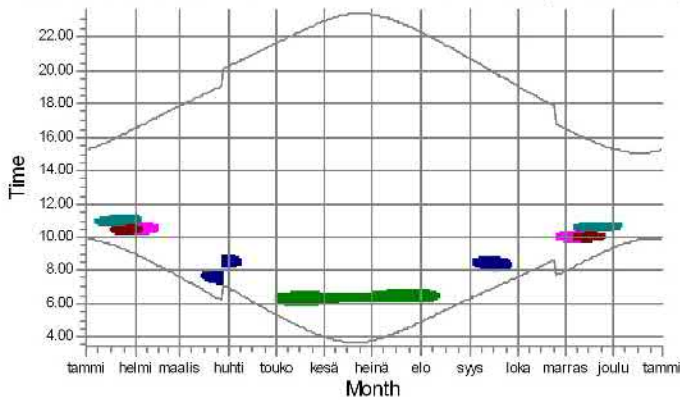
19: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



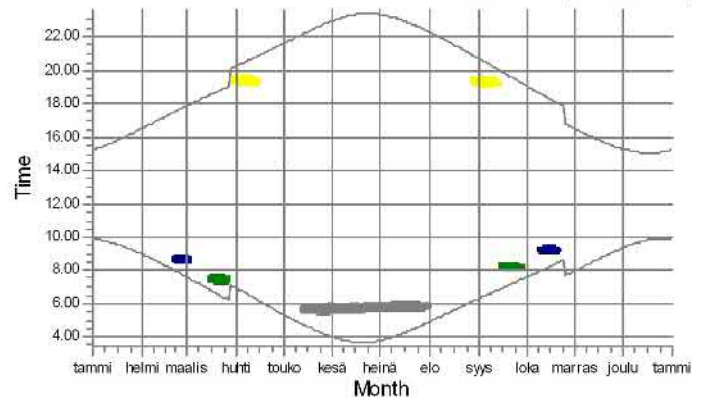
20: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



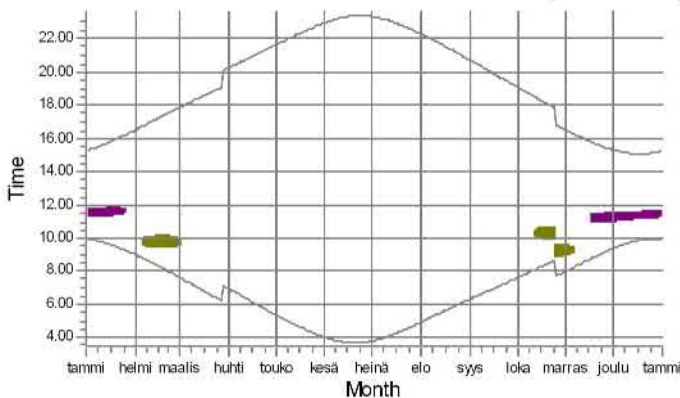
21: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



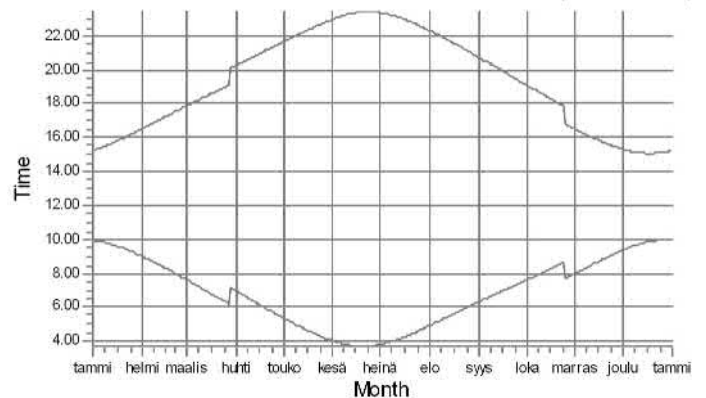
22: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)







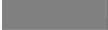





23: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



24: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



Shadow receptors

	A: Asuinrakennus A, ~Kankaanpääntie 534		G: Asuinrakennus G, ~Kankaanpääntie 468
	B: Asuinrakennus B, ~Ristiläntie 459		H: Lomarakennus H, ~Kankaanpääntie 320
	D: Asuinrakennus D, ~Kankaanpääntie 646		I: Asuinrakennus I, ~Kankaanpääntie 218
	E: Asuinrakennus E, ~Välisälontie 130		J: Asuinrakennus J, ~Penkkinevantie 85
	F: Asuinrakennus F, ~Välisälontie 101		K: Asuinrakennus K, ~Seppäkoskentie 36

Project:

Paholammi /Neoen

Licensed user:

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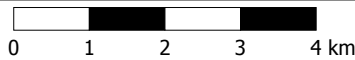
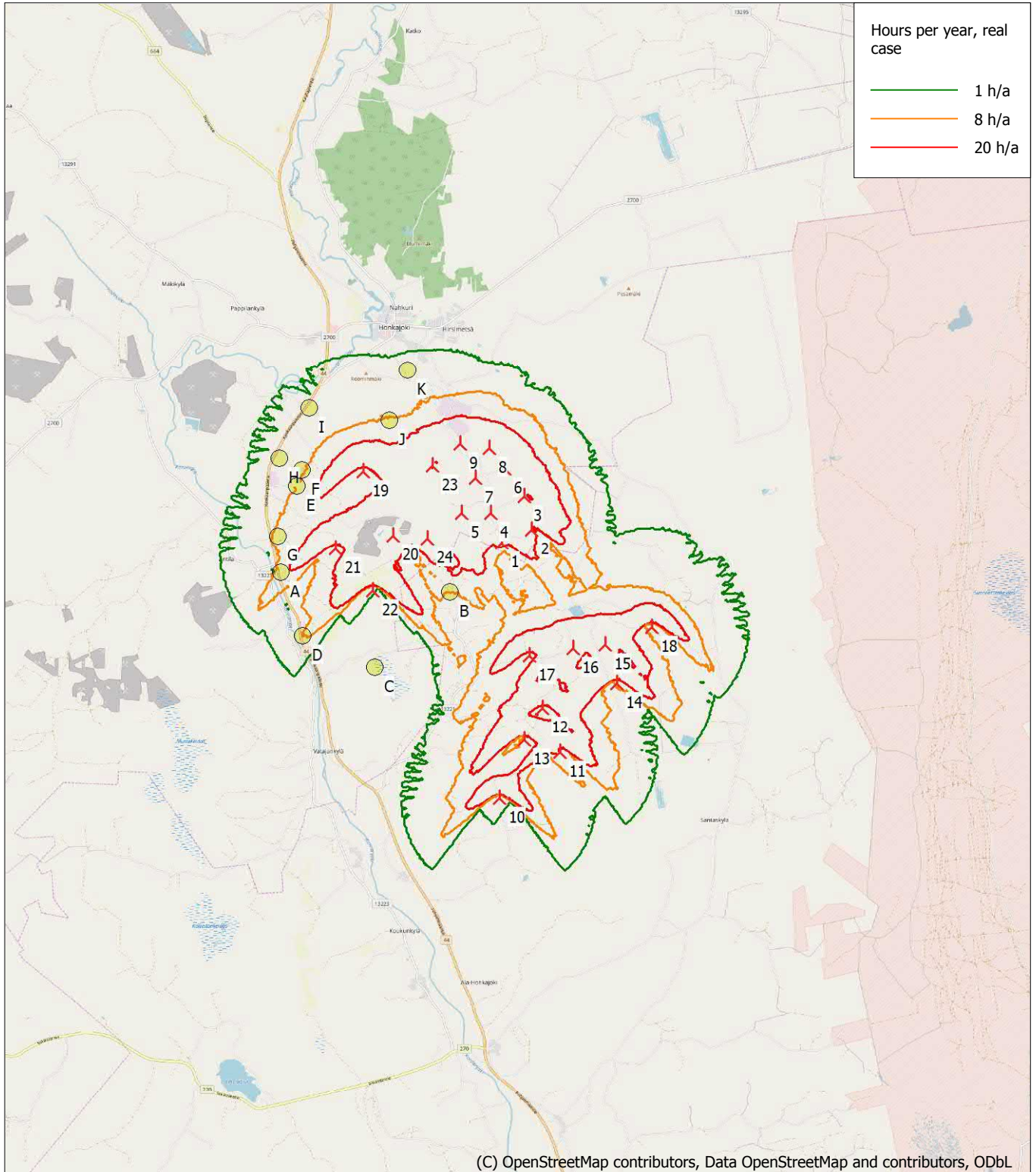
Johanna Harju / johanna.harju@fcg.fi

Calculated:

29.11.2021 15.51/3.4.388

SHADOW - Map

Calculation: Paholammi_VE2_Shadow_No_Forest_20211129



Map: EMD OpenStreetMap , Print scale 1:100 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 620 North: 6 877 590

New WTG

Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_EP_Tuulivoimaselvitys_0.wpo (4)

30.10.2021

Liite 4: Varjostusmallinnusten tulokset "real case, Forest"

Project:

Paholammi / Neoen

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 12.22/3.4.388

SHADOW - Main Result

Calculation: Paholammi_VE1_Shadow__Forest_20211129

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

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: CONTOURLINE_EP_Tuulivoimaselvitys

Area object(s) used in calculation:

Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REG

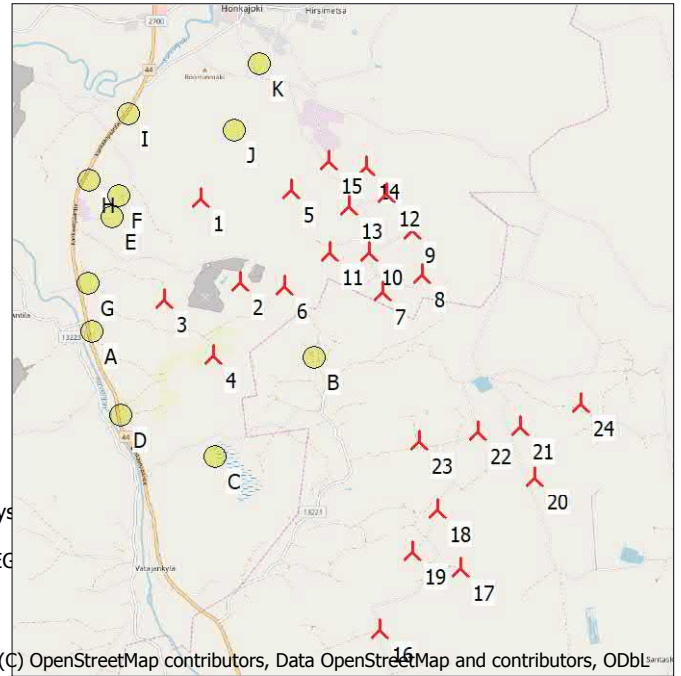
Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89



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

Scale 1:100 000

▲ New WTG

● Shadow receptor

WTGs

Row	East	North	Z	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM
			[m]									
1	251 304	6 879 975	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
2	251 747	6 878 810	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
3	250 727	6 878 659	100,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
4	251 315	6 877 881	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
5	252 523	6 879 987	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
6	252 334	6 878 721	102,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	219,0	2 036	10,4
7	253 616	6 878 546	105,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
8	254 154	6 878 757	112,2	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
9	254 073	6 879 329	112,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
10	253 487	6 879 084	110,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
11	252 957	6 879 121	107,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
12	253 775	6 879 840	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
13	253 252	6 879 721	117,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
14	253 525	6 880 225	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
15	253 026	6 880 328	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
16	253 256	6 874 086	105,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
17	254 378	6 874 820	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
18	254 139	6 875 605	109,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
19	253 765	6 875 082	105,6	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
20	255 464	6 875 947	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
21	255 305	6 876 650	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
22	254 745	6 876 621	107,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
23	253 975	6 876 541	107,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
24	256 142	6 876 896	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
A	Asuinrakennus A, ~Kankaanpääntie 534	249 740	6 878 307	92,4	5,0	5,0	1,0	90,0	"Green house mode"	6,0
B	Asuinrakennus B, ~Ristilantie 459	252 656	6 877 758	100,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

To be continued on next page...

SHADOW - Main Result

Calculation: Paholammi_VE1_Shadow__Forest_20211129

...continued from previous page

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
C	Lomarakennus C, ~Variksentie 93	251 251	6 876 536	93,2	5,0	5,0	1,0	90,0	"Green house mode"	6,0
D	Asuinrakennus D, ~Kankaanpääntie 646	250 034	6 877 181	87,7	5,0	5,0	1,0	90,0	"Green house mode"	6,0
E	Asuinrakennus E, ~Välisalontie 130	250 125	6 879 799	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
F	Asuinrakennus F, ~Välisalontie 101	250 226	6 880 083	97,6	5,0	5,0	1,0	90,0	"Green house mode"	6,0
G	Asuinrakennus G, ~Kankaanpääntie 468	249 740	6 878 942	94,8	5,0	5,0	1,0	90,0	"Green house mode"	6,0
H	Lomarakennus H, ~Kankaanpääntie 320	249 856	6 880 304	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
I	Asuinrakennus I, ~Kankaanpääntie 218	250 438	6 881 151	96,3	5,0	5,0	1,0	90,0	"Green house mode"	6,0
J	Asuinrakennus J, ~Penkkinevantie 85	251 819	6 880 838	102,5	5,0	5,0	1,0	90,0	"Green house mode"	6,0
K	Asuinrakennus K, ~Seppäkoskentie 36	252 204	6 881 690	105,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values	
		Shadow hours	per year [h/year]
A	Asuinrakennus A, ~Kankaanpääntie 534		13:04
B	Asuinrakennus B, ~Ristiläntie 459		3:16
C	Lomarakennus C, ~Variksentie 93		0:00
D	Asuinrakennus D, ~Kankaanpääntie 646		0:00
E	Asuinrakennus E, ~Välisalontie 130		9:33
F	Asuinrakennus F, ~Välisalontie 101		1:49
G	Asuinrakennus G, ~Kankaanpääntie 468		12:20
H	Lomarakennus H, ~Kankaanpääntie 320		0:00
I	Asuinrakennus I, ~Kankaanpääntie 218		0:00
J	Asuinrakennus J, ~Penkkinevantie 85		9:16
K	Asuinrakennus K, ~Seppäkoskentie 36		0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)	70:17	15:03
2	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690)	31:43	3:59
3	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691)	107:06	22:21
4	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692)	21:32	4:26
5	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (693)	20:56	3:21
6	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (694)	0:00	0:00
7	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712)	0:00	0:00
8	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)	0:00	0:00
9	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714)	0:00	0:00
10	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)	0:00	0:00
11	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716)	0:00	0:00
12	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717)	0:00	0:00
13	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)	0:00	0:00
14	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719)	0:00	0:00
15	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)	0:00	0:00
16	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)	0:00	0:00
17	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)	0:00	0:00
18	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)	0:00	0:00
19	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)	0:00	0:00
20	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)	0:00	0:00
21	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)	0:00	0:00
22	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)	0:00	0:00
23	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)	0:00	0:00
24	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)	0:00	0:00

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.

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December	
1	09.55	08.59	07.37	06.57	05.21	04.01	06.06 (3) 03.48	06.13 (3) 04.55	06.24 (3) 06.18	07.36	08.00	09.22	
2	09.54	08.57	07.34	06.54	05.18	03.59	06.06 (3) 03.49	06.13 (3) 04.58	06.26 (3) 06.21	07.39	08.03	09.25	
3	09.53	08.54	07.31	06.50	05.15	03.57	06.06 (3) 03.50	06.13 (3) 05.01	06.28 (3) 06.24	07.41	08.06	09.27	
4	09.52	08.51	07.28	06.47	05.12	03.56	06.07 (3) 03.52	06.13 (3) 05.03	06.33 (3) 06.26	07.44	08.09	09.29	
5	09.52	08.49	07.24	06.44	05.09	03.54	06.07 (3) 03.53	06.13 (3) 05.06	06.37 (3) 06.29	07.46	08.12	09.31	
6	09.50	08.46	07.21	06.41	05.07	03.53	06.07 (3) 03.55	06.13 (3) 05.09	06.31	07.49	08.14	09.33	
7	09.49	08.43	07.18	06.37	05.04	03.51	06.08 (3) 03.57	06.14 (3) 05.11	06.34	07.52	08.17	09.35	
8	09.48	08.40	07.15	06.34	05.01	03.50	06.08 (3) 03.58	06.13 (3) 05.14	06.37	07.54	08.20	09.37	
9	09.47	08.37	07.12	06.31	04.58	03.48	06.08 (3) 04.00	06.14 (3) 05.17	06.39	07.57	08.23	09.39	
10	09.46	08.35	07.08	06.28	04.55	03.47	06.08 (3) 04.02	06.13 (3) 05.20	06.42	08.00	08.26	09.41	
11	09.44	08.32	07.05	06.24	04.52	03.46	06.09 (3) 04.04	06.14 (3) 05.22	06.44	08.02	08.29	09.43	
12	09.43	08.29	07.02	06.21	04.49	03.45	06.09 (3) 04.06	06.14 (3) 05.25	06.47	08.05	08.32	09.44	
13	09.41	08.26	06.59	06.18	04.46	03.44	06.10 (3) 04.08	06.14 (3) 05.28	06.50	08.08	08.34	09.46	
14	09.39	08.23	06.56	06.15	04.44	03.44	06.09 (3) 04.10	06.14 (3) 05.30	06.52	08.10	08.37	09.47	
15	09.38	08.20	06.52	06.12	04.41	03.43	06.10 (3) 04.13	06.14 (3) 05.33	06.55	08.13	08.40	09.48	
16	09.36	08.17	06.49	06.08	04.38	03.42	06.10 (3) 04.15	06.15 (3) 05.36	06.57	08.16	08.43	09.50	
17	09.34	08.14	06.46	06.05	04.36	03.42	06.10 (3) 04.17	06.15 (3) 05.39	07.00	08.19	08.46	09.51	
18	09.32	08.11	06.43	06.02	04.33	03.42	06.10 (3) 04.19	06.14 (3) 05.41	07.02	08.21	08.48	09.52	
19	09.30	08.08	06.39	05.59	04.30	03.41	06.10 (3) 04.22	06.15 (3) 05.44	07.05	08.24	08.51	09.53	
20	09.28	08.05	06.36	05.56	04.28	03.41	06.11 (3) 04.24	06.15 (3) 05.47	07.08	08.27	08.54	09.54	
21	09.26	08.02	06.33	05.52	04.25	03.41	06.12 (3) 04.27	06.15 (3) 05.49	07.10	08.29	08.57	09.54	
22	09.24	07.59	06.30	05.49	04.23	03.41	06.12 (3) 04.29	06.16 (3) 05.52	07.13	08.32	08.59	09.55	
23	09.21	07.56	06.26	05.46	04.20	03.42	06.12 (3) 04.32	06.17 (3) 05.55	07.15	08.35	09.02	09.55	
24	09.19	07.53	06.23	05.43	04.18	03.42	06.12 (3) 04.34	06.17 (3) 05.57	07.18	08.38	09.05	09.56	
25	09.17	07.50	06.20	05.40	04.16	03.43	06.12 (3) 04.37	06.17 (3) 06.00	07.20	08.41	09.07	09.56	
26	09.14	07.47	06.17	05.37	04.13	03.43	06.13 (3) 04.39	06.18 (3) 06.03	07.23	08.43	09.10	09.56	
27	09.12	07.43	06.13	05.34	04.11	03.44	06.12 (3) 04.42	06.18 (3) 06.05	07.26	08.46	09.13	09.56	
28	09.09	07.40	06.10	05.31	04.09	03.45	06.13 (3) 04.45	06.20 (3) 06.08	07.28	08.49	09.15	09.56	
29	09.07	07.37	06.07	05.28	04.07	03.46	06.13 (3) 04.47	06.20 (3) 06.11	07.31	08.52	09.18	09.56	
30	09.04	07.34	06.04	05.25	04.04	03.47	06.13 (3) 04.50	06.21 (3) 06.13	07.33	08.55	09.20	09.56	
31	09.02	07.30	06.00	05.21	04.00	03.48	06.13 (3) 04.53	06.22 (3) 06.16	07.35	08.57	09.22	09.55	
Potential sun hours	194	247	364	443	547	735	1095	1116	995	390	311	215	167
Total, worst case						735	1095	1116	995	390	311	215	167
Sun reduction						0,50	0,47	0,48	0,43				
Oper. time red.						0,88	0,88	0,88	0,88				
Wind dir. red.						0,62	0,62	0,62	0,62				
Total reduction						0,27	0,26	0,26	0,23				
Total, real						200	280	291	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		

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** B - Asuinrakennus B, ~Ristoläntie 459
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	19.03 (4)	07.36	08.00	09.22	
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	28	19.31 (4)	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	19.03 (4)	07.38	08.03	09.24	
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	27	19.30 (4)	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	19.03 (4)	07.41	08.06	09.27	
	15.19	16.38	17.58	20.21	7 19.24 (4)	21.43	23.03	23.20	22.13	27	19.30 (4)	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	19.03 (4)	07.44	08.09	09.29	
	15.20	16.40	18.01	20.24	14 19.27 (4)	21.46	23.05	23.19	22.10	26	19.29 (4)	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	19.04 (4)	07.46	08.11	09.31	
	15.22	16.43	18.03	20.27	19 19.29 (4)	21.49	23.07	23.17	22.07	24	19.28 (4)	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.09	06.31	19.04 (4)	07.49	08.14	09.33	
	15.24	16.46	18.06	20.29	22 19.30 (4)	21.52	23.09	23.16	22.04	22	19.26 (4)	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	19.06 (4)	07.52	08.17	09.35	
	15.26	16.49	18.09	20.32	24 19.31 (4)	21.55	23.10	23.15	22.01	19	19.25 (4)	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	19.07 (4)	07.54	08.20	09.37	
	15.28	16.52	18.12	20.35	26 19.32 (4)	21.57	23.12	23.13	21.58	15	19.22 (4)	18.43	16.09	15.09
9	09.47	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	19.09 (4)	07.57	08.23	09.39	
	15.30	16.55	18.14	20.38	27 19.32 (4)	22.00	23.14	23.12	21.55	9	19.18 (4)	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	19.10 (4)	07.59	08.26	09.41	
	15.33	16.58	18.17	20.40	27 19.32 (4)	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07	
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	19.11 (4)	08.02	08.28	09.42	
	15.35	17.01	18.20	20.43	29 19.33 (4)	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06	
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	19.12 (4)	08.05	08.31	09.44	
	15.37	17.04	18.22	20.46	28 19.31 (4)	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.05	
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	19.13 (4)	08.07	08.34	09.45	
	15.40	17.07	18.25	20.48	28 19.31 (4)	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05	
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	19.14 (4)	08.10	08.37	09.47	
	15.42	17.10	18.28	20.51	28 19.31 (4)	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04	
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	19.15 (4)	08.13	08.40	09.48	
	15.45	17.13	18.31	20.54	27 19.30 (4)	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04	
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	19.16 (4)	08.16	08.43	09.49	
	15.47	17.15	18.33	20.57	26 19.29 (4)	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04	
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	19.17 (4)	08.18	08.45	09.51	
	15.50	17.18	18.36	20.59	24 19.28 (4)	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04	
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	19.18 (4)	08.21	08.48	09.52	
	15.52	17.21	18.39	21.02	22 19.27 (4)	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04	
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	19.19 (4)	08.24	08.51	09.52	
	15.55	17.24	18.41	21.05	20 19.26 (4)	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04	
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	19.20 (4)	08.26	08.54	09.53	
	15.58	17.27	18.44	21.07	17 19.24 (4)	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04	
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	19.21 (4)	08.29	08.56	09.54	
	16.00	17.30	18.47	21.10	12 19.22 (4)	22.33	23.25	22.47	21.18	6 19.24 (4)	18.02	15.37	15.04	
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	19.22 (4)	08.32	08.59	09.55	
	16.03	17.33	18.49	21.13	1 19.16 (4)	22.35	23.25	22.45	21.15	13 19.27 (4)	17.59	15.35	15.05	
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.54	07.15	19.23 (4)	08.35	09.02	09.55	
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	17 19.29 (4)	19.32	17.56	15.33	15.05	
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	19.24 (4)	08.38	09.05	09.55	
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	21 19.30 (4)	19.28	17.53	15.31	15.06	
25	09.16	07.49	06.20	05.40	04.16	03.42	04.37	06.00	07.20	19.25 (4)	07.40	09.07	09.56	
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	23 19.30 (4)	19.25	16.50	15.29	15.07	
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	19.26 (4)	07.43	09.10	09.56	
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	24 19.31 (4)	19.22	16.47	15.27	15.07	
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	19.27 (4)	07.46	09.12	09.56	
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	26 19.31 (4)	19.18	16.44	15.25	15.08	
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	19.28 (4)	07.49	09.15	09.56	
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	27 19.32 (4)	19.15	16.41	15.23	15.09	
29	09.07	07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.31	19.29 (4)	07.52	09.17	09.56	
	16.23	18.08	21.32	22.52	23.23	22.27	20.53	28 19.32 (4)	19.12	16.38	15.21	15.11		
30	09.04	07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.33	19.04 (4)	07.54	09.20	09.55	
	16.26	20.11	21.35	22.55	23.22	22.24	20.50	28 19.32 (4)	19.09	16.35	15.19	15.12		
31	09.02	07.00	04.03	04.03	04.52	06.16	07.33	07.33	07.33	19.03 (4)	07.57	09.21	09.55	
	16.29	20.13	22.57	22.57	22.21	20.47	28 19.31 (4)	19.09	16.32	15.13	15.13			
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167		
Total, worst case				428				241	197					
Sun reduction				0,45				0,43	0,36					
Oper. time red.				0,88				0,88	0,88					
Wind dir. red.				0,61				0,61	0,61					
Total reduction				0,24				0,23	0,19					
Total, real				103				55	38					

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: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** C - Lomarakennus C, ~Variksentie 93
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.06	16.29	15.18
2	09.54	08.56	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.34	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.10	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.14	20.38	22.00	23.14	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.49
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.55
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** D - Asuinrakennus D, ~Kankaanpääntie 646
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.22	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.58	03.51	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.24	15.15
4	09.52	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.21	15.14
5	09.51	08.49	07.24	06.44	05.10	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.17	22.07	20.31	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.07	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.12	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.15	20.38	22.00	23.14	23.12	21.55	20.18	18.40	16.07	15.08
10	09.45	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.34	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.47	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.18	08.46	09.51
	15.50	17.19	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.30	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.21	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.58	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	21.00	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.25	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55	08.59	10.25 (3)	07.37	08.24 (2)	06.57
	15.15	16.32	17	10.42 (3)	17.52	18
2	09.54	08.57	10.23 (3)	07.34	08.23 (2)	06.54
	15.17	16.35	21	10.44 (3)	17.55	18
3	09.53	08.54	10.22 (3)	07.31	08.22 (2)	06.50
	15.19	16.38	23	10.45 (3)	17.58	20
4	09.53	08.51	10.21 (3)	07.28	08.22 (2)	06.47
	15.20	16.41	25	10.46 (3)	18.01	20
5	09.52	08.49	10.20 (3)	07.24	08.21 (2)	06.44
	15.22	16.44	27	10.47 (3)	18.04	21
6	09.51	08.46	10.20 (3)	07.21	08.22 (2)	06.41
	15.24	16.46	28	10.48 (3)	18.06	19
7	09.50	08.43	10.20 (3)	07.18	08.22 (2)	06.37
	15.26	16.49	29	10.49 (3)	18.09	19
8	09.48	08.40	10.19 (3)	07.15	08.22 (2)	06.34
	15.28	16.52	29	10.48 (3)	18.12	17
9	09.47	08.38	10.19 (3)	07.12	08.24 (2)	06.31
	15.30	16.55	30	10.49 (3)	18.15	14
10	09.46	08.35	10.19 (3)	07.08	08.26 (2)	06.28
	15.33	16.58	30	10.49 (3)	18.17	10
11	09.44	08.32	10.19 (3)	07.05	08.36 (2)	06.24
	15.35	17.01	31	10.50 (3)	18.20	
12	09.43	08.29	10.20 (3)	07.02	06.21	20.43
	15.37	17.04	30	10.50 (3)	18.23	20.46
13	09.41	08.26	10.19 (3)	06.59	06.18	20.46
	15.40	17.07	30	10.49 (3)	18.25	20.49
14	09.39	08.23	10.20 (3)	06.56	06.15	20.49
	15.42	17.10	29	10.49 (3)	18.28	06.15
15	09.38	08.20	10.21 (3)	06.52	06.12	20.51
	15.45	17.13	28	10.49 (3)	18.31	20.51
16	09.36	08.17	10.21 (3)	06.49	06.08	20.54
	15.47	17.16	26	10.47 (3)	18.33	20.54
17	09.34	08.14	10.22 (3)	06.46	06.05	20.57
	15.50	17.18	24	10.46 (3)	18.36	06.05
18	09.32	08.11	10.23 (3)	06.43	06.02	21.00
	15.52	17.21	22	10.45 (3)	18.39	06.02
19	09.30	08.08	10.25 (3)	06.39	05.59	21.02
	15.55	17.24	19	10.44 (3)	18.42	21.02
20	09.28	08.05	10.26 (3)	06.36	05.56	21.05
	15.58	17.27	15	10.41 (3)	18.44	21.05
21	09.26	08.02	10.31 (3)	06.33	05.52	21.08
	16.00	17.30	5	10.36 (3)	18.47	05.52
22	09.24	07.59		06.30	05.49	06.59 (1)
	16.03	17.33		18.50	21.13	06.56 (1)
23	09.21	07.56		06.26	05.46	06.56 (1)
	16.06	17.36		18.52	21.16	06.54 (1)
24	09.19	07.53		06.23	05.43	06.54 (1)
	16.09	17.38		18.55	21.19	07.15 (1)
25	09.17	07.50		06.20	05.40	06.52 (1)
	16.12	17.41		18.58	21.22	07.16 (1)
26	09.14	07.47	08.32 (2)	06.16	05.37	06.51 (1)
	16.14	17.44	4	08.36 (2)	19.00	06.50 (1)
27	09.12	07.43	08.27 (2)	06.13	05.34	07.18 (1)
	16.17	17.47	11	08.38 (2)	19.03	06.49 (1)
28	09.10	07.40	08.25 (2)	06.10	05.31	07.19 (1)
	16.20	17.50	15	08.40 (2)	19.06	06.48 (1)
29	09.07			07.07	05.27	04.09
	16.23			20.08	21.30	07.19 (1)
30	09.05	10.30 (3)		07.03	05.24	06.47 (1)
	16.26	7	10.37 (3)	20.11	21.35	07.19 (1)
31	09.02	10.26 (3)		07.00		04.05
	16.29	14	10.40 (3)	20.14		22.55
Potential sun hours	194	247	364	443	547	586
Total, worst case	21	548	176	254	443	
Sun reduction	0,16	0,32	0,36	0,45	0,50	
Oper. time red.	0,88	0,88	0,88	0,88	0,88	
Wind dir. red.	0,66	0,66	0,62	0,59	0,59	
Total reduction	0,09	0,19	0,20	0,24	0,26	
Total, real	2	103	35	60	117	

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: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** E - Asuinrakennus E, ~Välisäntie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	07.00 (1)	06.18	07.36	08.00
	23.22	22.19	25 07.25 (1)	20.44	19.06	16.29
2	03.49	04.58	06.59 (1)	06.21	07.39	08.03
	23.21	22.16	27 07.26 (1)	20.40	19.02	16.26
3	03.50	05.01	06.58 (1)	06.24	07.41	08.06
	23.20	22.13	28 07.26 (1)	20.37	18.59	8 09.12 (2)
4	03.52	05.03	06.58 (1)	06.26	07.44	08.09
	23.19	22.10	30 07.28 (1)	20.34	18.56	13 09.15 (2)
5	03.53	05.06	06.57 (1)	06.29	07.46	08.12
	23.18	22.07	31 07.28 (1)	20.31	18.53	16 09.16 (2)
6	03.55	05.09	06.56 (1)	06.31	07.49	08.15
	23.16	22.04	32 07.28 (1)	20.27	18.50	18 09.16 (2)
7	03.56	05.11	06.56 (1)	06.34	07.52	08.17
	23.15	22.02	32 07.28 (1)	20.24	18.46	19 09.17 (2)
8	03.58	05.14	06.56 (1)	06.37	07.54	08.20
	23.14	21.59	32 07.28 (1)	20.21	18.43	20 09.17 (2)
9	04.00	05.17	06.56 (1)	06.39	07.57	08.23
	23.12	21.56	33 07.29 (1)	20.18	18.40	20 09.17 (2)
10	04.02	05.19	06.55 (1)	06.42	08.00	08.26
	23.10	21.53	33 07.28 (1)	20.14	18.37	20 09.17 (2)
11	04.04	05.22	06.55 (1)	06.44	08.02	08.29
	23.09	21.50	33 07.28 (1)	20.11	18.33	20 09.16 (2)
12	04.06	05.25	06.55 (1)	06.47	08.05	08.32
	23.07	21.47	33 07.28 (1)	20.08	18.30	18 09.15 (2)
13	04.08	05.28	06.55 (1)	06.50	08.08	08.34
	23.05	21.44	32 07.27 (1)	20.04	18.27	16 09.14 (2)
14	04.10	05.30	06.56 (1)	06.52	08.10	08.37
	23.03	21.41	31 07.27 (1)	20.01	18.24	13 09.12 (2)
15	04.12	05.33	06.56 (1)	06.55	08.13	08.40
	23.01	21.37	30 07.26 (1)	19.58	18.21	9 09.10 (2)
16	04.15	05.36	06.57 (1)	06.57	08.16	08.43
	22.59	21.34	29 07.26 (1)	19.55	18.18	15.49
17	04.17	05.38	06.57 (1)	07.00	08.19	08.46
	22.57	21.31	28 07.25 (1)	19.51	18.15	15.46
18	04.19	05.41	06.57 (1)	07.02	08.21	08.49
	22.54	21.28	26 07.23 (1)	19.48	18.11	15.44
19	04.22	05.44	06.59 (1)	07.05	08.24	08.51
	22.52	21.25	23 07.22 (1)	19.45	18.08	15.42
20	04.24	05.47	06.59 (1)	07.08	08.27	08.54
	22.50	21.22	21 07.20 (1)	19.42	18.05	15.39
21	04.27	05.49	07.02 (1)	07.10	08.29	08.57
	22.47	21.19	17 07.19 (1)	19.38	18.02	9 11.09 (3)
22	04.29	05.52	07.04 (1)	07.13	08.32	09.00
	22.45	21.16	11 07.15 (1)	19.35	17.59	15 11.12 (3)
23	04.32	05.55	07.15	07.15	08.35	09.02
	22.43	21.12	19.32	17.56	20 11.14 (3)	15.33
24	04.34	05.57	07.18	08.38	10.53 (3)	09.05
	22.40	21.09	19.28	17.53	23 11.16 (3)	15.31
25	04.37	06.00	07.20	07.41	09.52 (3)	09.07
	22.38	21.06	19.25	16.50	25 10.17 (3)	15.29
26	04.39	06.03	07.23	07.43	09.51 (3)	09.10
	22.35	21.03	19.22	16.47	26 10.17 (3)	15.27
27	04.42	07.07 (1)	06.05	07.26	07.46	09.50 (3)
	22.32	10 07.17 (1)	21.00	19.19	16.44	28 10.18 (3)
28	04.44	07.04 (1)	06.08	07.28	07.49	09.49 (3)
	22.30	15 07.19 (1)	20.56	19.15	16.41	29 10.18 (3)
29	04.47	07.04 (1)	06.10	07.31	07.52	09.48 (3)
	22.27	17 07.21 (1)	20.53	19.12	16.38	30 10.18 (3)
30	04.50	07.02 (1)	06.13	07.33	07.55	09.49 (3)
	22.24	21 07.23 (1)	20.50	19.09	16.35	30 10.19 (3)
31	04.52	07.01 (1)	06.16	07.37	07.57	09.49 (3)
	22.22	23 07.24 (1)	20.47	19.06	16.32	30 10.19 (3)
Potential sun hours	579	495	390	311	215	166
Total, worst case	86	617			475	278
Sun reduction	0,48	0,43			0,25	0,16
Oper. time red.	0,88	0,88			0,88	0,88
Wind dir. red.	0,59	0,59			0,64	0,66
Total reduction	0,25	0,23			0,14	0,10
Total, real	22	139			69	27

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: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** F - Asuinrakennus F, ~Välisalontie 101
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December		
1	09.55	08.59	10.53 (3)	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	10.33 (3)	09.22
	15.15	16.32	26 11.19 (3)	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	5 10.38 (3)	15.18
2	09.54	08.57	10.53 (3)	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	10.29 (3)	09.25
	15.17	16.35	26 11.19 (3)	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	13 10.42 (3)	15.16
3	09.53	08.54	10.53 (3)	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	10.28 (3)	09.27
	15.18	16.38	25 11.18 (3)	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.23	17 10.45 (3)	15.15
4	09.53	08.51	10.54 (3)	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	10.26 (3)	09.29
	15.20	16.41	24 11.18 (3)	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	20 10.46 (3)	15.13
5	09.52	08.49	10.55 (3)	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	10.25 (3)	09.31
	15.22	16.43	23 11.18 (3)	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	22 10.47 (3)	15.12
6	09.51	08.46	10.56 (3)	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	10.24 (3)	09.33
	15.24	16.46	21 11.17 (3)	18.06	20.30	21.52	23.09	23.16	22.05	20.27	18.49	16.15	23 10.47 (3)	15.11
7	09.50	08.43	10.57 (3)	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	10.24 (3)	09.35
	15.26	16.49	19 11.16 (3)	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	25 10.49 (3)	15.10
8	09.48	08.40	10.58 (3)	07.15	06.34	05.01	03.49	03.58	05.14	06.37	07.54	08.20	10.24 (3)	09.37
	15.28	16.52	16 11.14 (3)	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	25 10.49 (3)	15.09
9	09.47	08.38	11.00 (3)	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	10.24 (3)	09.39
	15.30	16.55	12 11.12 (3)	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	26 10.50 (3)	15.08
10	09.46	08.35	11.07 (3)	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	10.23 (3)	09.41
	15.33	16.58	18 11.17 (3)	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.37	16.04	27 10.50 (3)	15.07
11	09.44	08.32	11.08 (3)	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	10.23 (3)	09.43
	15.35	17.01	18 11.17 (3)	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	27 10.50 (3)	15.06
12	09.43	08.29	11.09 (3)	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	10.24 (3)	09.44
	15.37	17.04	18 11.16 (3)	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	26 10.50 (3)	15.05
13	09.41	08.26	11.10 (3)	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	10.24 (3)	09.46
	15.40	17.07	18 11.15 (3)	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	26 10.50 (3)	15.05
14	09.39	08.23	11.11 (3)	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	10.25 (3)	09.47
	15.42	17.10	18 11.14 (3)	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	25 10.50 (3)	15.04
15	09.38	08.20	11.12 (3)	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	10.25 (3)	09.49
	15.45	17.13	18 11.13 (3)	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	25 10.50 (3)	15.04
16	09.36	08.17	11.14 (3)	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	10.25 (3)	09.50
	15.47	17.16	18 11.12 (3)	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	24 10.49 (3)	15.04
17	09.34	08.14	11.15 (3)	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	10.26 (3)	09.51
	15.50	17.18	18 11.11 (3)	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	23 10.49 (3)	15.04
18	09.32	08.11	11.16 (3)	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	10.26 (3)	09.52
	15.52	17.21	5 11.05 (3)	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	23 10.49 (3)	15.03
19	09.30	08.08	11.17 (3)	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	10.28 (3)	09.53
	15.55	17.24	11 11.08 (3)	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	21 10.49 (3)	15.04
20	09.28	08.05	11.18 (3)	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	10.29 (3)	09.54
	15.58	17.27	14 11.10 (3)	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	19 10.48 (3)	15.04
21	09.26	08.02	11.19 (3)	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	10.30 (3)	09.54
	16.00	17.30	17 11.11 (3)	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	17 10.47 (3)	15.04
22	09.24	07.59	11.20 (3)	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	10.32 (3)	09.55
	16.03	17.33	19 11.13 (3)	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	14 10.46 (3)	15.05
23	09.21	07.56	11.21 (3)	06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	10.34 (3)	09.56
	16.06	17.36	21 11.14 (3)	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	11 10.45 (3)	15.05
24	09.19	07.53	11.22 (3)	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	10.37 (3)	09.56
	16.09	17.38	23 11.15 (3)	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	5 10.42 (3)	15.06
25	09.17	07.50	11.23 (3)	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.07	10.38 (3)	09.56
	16.12	17.41	23 11.15 (3)	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.06	
26	09.14	07.47	11.24 (3)	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	10.39 (3)	09.56
	16.14	17.44	24 11.16 (3)	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07	
27	09.12	07.43	11.25 (3)	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	10.40 (3)	09.56
	16.17	17.47	25 11.17 (3)	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08	
28	09.10	07.40	11.26 (3)	06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	10.41 (3)	09.56
	16.20	17.50	25 11.17 (3)	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09	
29	09.07	07.37	11.27 (3)	07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	10.42 (3)	09.56
	16.23	17.53	26 11.18 (3)	19.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11	
30	09.05	07.34	11.28 (3)	07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	10.43 (3)	09.56
	16.26	17.56	26 11.18 (3)	20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12	
31	09.02	07.31	11.29 (3)	07.00	05.21	04.03	03.47	04.52	06.16	07.37	07.57	09.21	10.44 (3)	09.55
	16.29	17.59	27 11.19 (3)	20.14	21.38	22.57	23.22	22.22	20.47	16.32	15.18	15.13	15.13	
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166		
Total, worst case	286	192									489			
Sun reduction	0,16	0,32									0,16			
Oper. time red.	0,88	0,88									0,88			
Wind dir. red.	0,66	0,66									0,66			
Total reduction	0,09	0,19									0,10			
Total, real	27	36									47			

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)

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129Shadow receptor: G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June				
1	09.55	08.59	07.37	08.32 (4)	06.57	07.38 (2)	05.21	04.01	05.13 (1)	
	15.15	16.32	17.52	21 08.53 (4)	20.16	53 08.58 (3)	21.38	22.59	20 05.33 (1)	
2	09.54	08.57	07.34	08.31 (4)	06.54	07.36 (2)	05.18	03.59	05.12 (1)	
	15.17	16.35	17.55	21 08.52 (4)	20.19	55 08.57 (3)	21.41	23.01	21 05.33 (1)	
3	09.53	08.54	07.31	08.32 (4)	06.50	07.35 (2)	05.15	03.57	05.12 (1)	
	15.19	16.38	17.58	20 08.52 (4)	20.22	56 08.57 (3)	21.44	23.03	21 05.33 (1)	
4	09.53	08.51	07.28	08.32 (4)	06.47	07.35 (2)	05.12	03.56	05.12 (1)	
	15.20	16.41	18.01	19 08.51 (4)	20.24	56 08.57 (3)	21.47	23.05	22 05.34 (1)	
5	09.52	08.49	07.24	08.32 (4)	06.44	07.35 (2)	05.09	03.54	05.13 (1)	
	15.22	16.44	18.04	18 08.50 (4)	20.27	55 08.56 (3)	21.49	23.07	21 05.34 (1)	
6	09.51	08.46	07.21	08.33 (4)	06.41	07.35 (2)	05.06	03.52	05.13 (1)	
	15.24	16.47	18.06	16 08.49 (4)	20.30	55 08.56 (3)	21.52	23.09	22 05.35 (1)	
7	09.49	08.43	07.18	08.35 (4)	06.37	07.35 (2)	05.04	03.51	05.13 (1)	
	15.26	16.49	18.09	12 08.47 (4)	20.32	51 08.54 (3)	21.55	23.11	22 05.35 (1)	
8	09.48	08.40	07.15	08.37 (4)	06.34	07.35 (2)	05.01	03.50	05.13 (1)	
	15.28	16.52	18.12	6 08.43 (4)	20.35	49 08.53 (3)	21.58	23.12	22 05.35 (1)	
9	09.47	08.37	07.12	06.31	06.31	07.36 (2)	04.58	03.48	05.13 (1)	
	15.30	16.55	18.15	20.38	45 08.52 (3)	22.00	23.14	22 05.35 (1)		
10	09.46	08.35	07.08	06.28	06.28	07.38 (2)	04.55	03.47	05.13 (1)	
	15.33	16.58	18.17	20.40	38 08.51 (3)	22.03	23.16	22 05.35 (1)		
11	09.44	08.32	07.05	06.24	06.24	08.22 (3)	04.52	03.46	05.14 (1)	
	15.35	17.01	18.20	20.43	27 08.49 (3)	22.06	23.17	22 05.36 (1)		
12	09.43	08.29	07.02	06.21	06.21	08.24 (3)	04.49	03.45	05.13 (1)	
	15.37	17.04	18.23	20.46	23 08.47 (3)	22.09	23.18	23 05.36 (1)		
13	09.41	08.26	06.59	06.18	06.18	08.25 (3)	04.46	03.44	05.14 (1)	
	15.40	17.07	18.25	20.49	20 08.45 (3)	22.12	23.19	22 05.36 (1)		
14	09.39	08.23	06.56	06.15	06.15	08.27 (3)	04.44	03.44	05.14 (1)	
	15.42	17.10	18.28	20.51	14 08.41 (3)	22.14	23.21	22 05.36 (1)		
15	09.38	08.20	06.52	06.12	06.12	04.41	03.43	05.14 (1)		
	15.45	17.13	18.31	20.54	22.17	23.22	23 05.37 (1)			
16	09.36	08.17	06.49	06.08	06.08	04.38	03.42	05.15 (1)		
	15.47	17.16	18.33	20.57	22.20	23.22	22 05.37 (1)			
17	09.34	08.14	06.46	06.05	06.05	04.36	03.42	05.14 (1)		
	15.50	17.19	18.36	21.00	22.22	23.23	22 05.36 (1)			
18	09.32	08.11	06.43	06.02	06.02	04.33	03.42	05.15 (1)		
	15.52	17.21	18.39	21.02	22.25	23.24	22 05.37 (1)			
19	09.30	08.08	06.39	05.59	05.59	04.30	03.41	05.15 (1)		
	15.55	17.24	18.42	21.05	22.28	23.24	22 05.37 (1)			
20	09.28	08.05	06.36	05.56	05.56	04.28	03.41	05.15 (1)		
	15.58	17.27	18.44	21.08	22.30	23.25	22 05.37 (1)			
21	09.26	08.02	06.33	05.52	05.52	04.25	03.41	05.16 (1)		
	16.01	17.30	18.47	21.10	22.33	23.25	22 05.38 (1)			
22	09.24	07.59	06.30	05.49	05.49	04.23	03.41	05.16 (1)		
	16.03	17.33	18.50	21.13	22.35	23.25	22 05.38 (1)			
23	09.21	07.56	08.42 (4)	06.26	07.36 (3)	05.46	04.20	05.20 (1)	03.42	05.16 (1)
	16.06	17.36	1 08.43 (4)	18.52	13 07.49 (3)	21.16	22.38	5 05.25 (1)	23.25	22 05.38 (1)
24	09.19	07.53	08.37 (4)	06.23	07.33 (3)	05.43	04.18	05.18 (1)	03.42	05.16 (1)
	16.09	17.38	11 08.48 (4)	18.55	19 07.52 (3)	21.19	22.41	9 05.27 (1)	23.25	22 05.38 (1)
25	09.17	07.50	08.36 (4)	06.20	07.29 (3)	05.40	04.16	05.16 (1)	03.43	05.16 (1)
	16.12	17.41	14 08.50 (4)	18.58	24 07.53 (3)	21.22	22.43	12 05.28 (1)	23.25	22 05.38 (1)
26	09.14	07.47	08.35 (4)	06.17	07.28 (3)	05.37	04.13	05.15 (1)	03.43	05.17 (1)
	16.15	17.44	16 08.51 (4)	19.00	27 07.55 (3)	21.24	22.45	14 05.29 (1)	23.25	22 05.39 (1)
27	09.12	07.43	08.33 (4)	06.13	07.26 (3)	05.34	04.11	05.14 (1)	03.44	05.17 (1)
	16.17	17.47	18 08.51 (4)	19.03	30 07.56 (3)	21.27	22.48	16 05.30 (1)	23.25	22 05.39 (1)
28	09.10	07.40	08.32 (4)	06.10	07.24 (3)	05.31	04.09	05.14 (1)	03.45	05.17 (1)
	16.20	17.50	20 08.52 (4)	19.06	32 07.56 (3)	21.30	22.50	17 05.31 (1)	23.24	22 05.39 (1)
29	09.07		07.07	08.23 (3)	05.28	04.07	04.07	05.13 (1)	03.46	05.17 (1)
	16.23		20.08	34 08.57 (3)	21.33	22.53	18 05.31 (1)	23.24	23 05.40 (1)	
30	09.05		07.03	07.42 (2)	05.24	04.05	04.05	05.13 (1)	03.47	05.18 (1)
	16.26		20.11	44 08.57 (3)	21.35	22.55	19 05.32 (1)	23.23	22 05.40 (1)	
31	09.02		07.00	07.39 (2)		04.03	04.03	05.12 (1)		
	16.29		20.14	50 08.58 (3)		22.57	20 05.32 (1)			
Potential sun hours	194	247	364	443	547	586				
Total, worst case			80	406	597	130			658	
Sun reduction			0,32	0,36	0,45	0,50			0,47	
Oper. time red.			0,88	0,88	0,88	0,88			0,88	
Wind dir. red.			0,63	0,61	0,60	0,63			0,63	
Total reduction			0,18	0,19	0,24	0,28			0,26	
Total, real			14	78	142	36			171	

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: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December			
1	03.48	05.18 (1)	04.55	06.18	08.21 (3)	07.36	08.00	09.22	
	23.22	22 05.40 (1)	22.19	20.44	27 08.48 (3)	19.06	16.29	15.18	
2	03.49	05.18 (1)	04.58	06.21	07.36 (2)	07.39	08.03	09.25	
	23.21	22 05.40 (1)	22.16	20.40	39 08.49 (3)	19.02	16.26	15.16	
3	03.50	05.18 (1)	05.01	06.24	07.34 (2)	07.41	08.06	09.27	
	23.20	22 05.40 (1)	22.13	20.37	45 08.50 (3)	18.59	16.23	15.15	
4	03.52	05.18 (1)	05.03	06.26	07.32 (2)	07.44	08.09	09.29	
	23.19	22 05.40 (1)	22.10	20.34	49 08.50 (3)	18.56	16.21	15.13	
5	03.53	05.18 (1)	05.06	06.29	07.32 (2)	07.46	08.12	09.31	
	23.18	22 05.40 (1)	22.07	20.31	51 08.51 (3)	18.53	16.18	15.12	
6	03.55	05.18 (1)	05.09	06.31	07.30 (2)	07.49	09.12 (4)	08.15	09.33
	23.16	22 05.40 (1)	22.04	20.27	55 08.51 (3)	18.50	9 09.21 (4)	16.15	15.11
7	03.57	05.19 (1)	05.11	06.34	07.30 (2)	07.52	09.10 (4)	08.17	09.35
	23.15	22 05.41 (1)	22.02	20.24	55 08.51 (3)	18.46	13 09.23 (4)	16.12	15.10
8	03.58	05.19 (1)	05.14	06.37	07.29 (2)	07.54	09.08 (4)	08.20	09.37
	23.13	22 05.41 (1)	21.59	20.21	56 08.51 (3)	18.43	17 09.25 (4)	16.10	15.09
9	04.00	05.20 (1)	05.17	06.39	07.30 (2)	07.57	09.07 (4)	08.23	09.39
	23.12	21 05.41 (1)	21.56	20.18	55 08.51 (3)	18.40	19 09.26 (4)	16.07	15.08
10	04.02	05.20 (1)	05.20	06.42	07.29 (2)	08.00	09.07 (4)	08.26	09.41
	23.10	20 05.40 (1)	21.53	20.14	55 08.50 (3)	18.37	19 09.26 (4)	16.04	15.07
11	04.04	05.20 (1)	05.22	06.44	07.30 (2)	08.02	09.05 (4)	08.29	09.43
	23.08	21 05.41 (1)	21.50	20.11	52 08.50 (3)	18.34	20 09.25 (4)	16.02	15.06
12	04.06	05.21 (1)	05.25	06.47	07.31 (2)	08.05	09.05 (4)	08.32	09.44
	23.07	20 05.41 (1)	21.47	20.08	49 08.49 (3)	18.30	20 09.25 (4)	15.59	15.05
13	04.08	05.21 (1)	05.28	06.50	07.33 (2)	08.08	09.05 (4)	08.34	09.46
	23.05	19 05.40 (1)	21.44	20.05	44 08.49 (3)	18.27	20 09.25 (4)	15.56	15.05
14	04.10	05.22 (1)	05.30	06.52	08.13 (3)	08.10	09.05 (4)	08.37	09.47
	23.03	18 05.40 (1)	21.41	20.01	34 08.47 (3)	18.24	20 09.25 (4)	15.54	15.04
15	04.13	05.22 (1)	05.33	06.55	08.14 (3)	08.13	09.06 (4)	08.40	09.49
	23.01	18 05.40 (1)	21.37	19.58	32 08.46 (3)	18.21	18 09.24 (4)	15.51	15.04
16	04.15	05.23 (1)	05.36	06.57	08.14 (3)	08.16	09.07 (4)	08.43	09.50
	22.59	17 05.40 (1)	21.34	19.55	31 08.45 (3)	18.18	16 09.23 (4)	15.49	15.04
17	04.17	05.24 (1)	05.39	07.00	08.16 (3)	08.19	09.08 (4)	08.46	09.51
	22.57	15 05.39 (1)	21.31	19.51	28 08.44 (3)	18.15	13 09.21 (4)	15.46	15.04
18	04.19	05.24 (1)	05.41	07.02	08.17 (3)	08.21	09.10 (4)	08.49	09.52
	22.54	14 05.38 (1)	21.28	19.48	24 08.41 (3)	18.11	9 09.19 (4)	15.44	15.04
19	04.22	05.26 (1)	05.44	07.05	08.19 (3)	08.24	08.51	09.53	
	22.52	11 05.37 (1)	21.25	19.45	20 08.39 (3)	18.08	15.42	15.04	
20	04.24	05.28 (1)	05.47	07.08	08.21 (3)	08.27	08.54	09.54	
	22.50	7 05.35 (1)	21.22	19.42	15 08.36 (3)	18.05	15.39	15.04	
21	04.27	05.29	05.49	07.10	08.26 (3)	08.29	08.57	09.54	
	22.47	21.19	19.38	4 08.30 (3)	18.02	15.37	15.04		
22	04.29	05.52	07.13	08.32	08.32	08.59	09.55		
	22.45	21.16	19.35	17.59	15.35	15.05			
23	04.32	05.55	07.15	08.35	09.02	09.55			
	22.43	21.12	19.32	17.56	15.33	15.05			
24	04.34	05.57	07.18	08.38	09.05	09.56			
	22.40	21.09	19.29	17.53	15.31	15.06			
25	04.37	06.00	07.20	07.41	09.07	09.56			
	22.38	21.06	19.25	16.50	15.29	15.07			
26	04.39	06.03	07.23	07.43	09.10	09.56			
	22.35	21.03	19.22	16.47	15.27	15.07			
27	04.42	06.05	07.26	07.46	09.13	09.56			
	22.32	21.00	19.19	16.44	15.25	15.08			
28	04.45	06.08	08.34 (3)	07.28	07.49	09.15	09.56		
	22.30	20.56	3 08.37 (3)	19.15	16.41	15.23	15.10		
29	04.47	06.11	08.29 (3)	07.31	07.52	09.18	09.56		
	22.27	20.53	14 08.43 (3)	19.12	16.38	15.21	15.11		
30	04.50	06.13	08.25 (3)	07.33	07.55	09.20	09.56		
	22.24	20.50	20 08.45 (3)	19.09	16.35	15.20	15.12		
31	04.53	06.16	08.23 (3)	07.37	07.57	09.23	09.55		
	22.22	20.47	23 08.46 (3)	19.06	16.32	15.19	15.13		
Potential sun hours	578	495	390	311	215	166			
Total, worst case	377	60	820	213					
Sun reduction	0,48	0,43	0,36	0,25					
Oper. time red.	0,88	0,88	0,88	0,88					
Wind dir. red.	0,63	0,60	0,60	0,63					
Total reduction	0,27	0,22	0,19	0,14					
Total, real	100	13	156	30					

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: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.25	06.44	05.09	03.54	03.53	05.06	06.29	07.47	08.12	09.31
	15.22	16.43	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.50	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.09
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.15	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.34	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.05	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.30	08.57	09.54
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129**Shadow receptor:** I - Asuinrakennus I, ~Kankaanpääntie 218
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.23
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.02	23.21	22.16	20.40	19.02	16.26	15.16
3	09.54	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.27
	15.18	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.49	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.37	07.54	08.20	09.38
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.07
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.19	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.44	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.55	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.55
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.15	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.26	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.43	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.56
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January		February		March		April		May		June	
1	09.55	12.15 (2)	08.59		14.24 (1)	07.37		09.34 (5)	06.57	05.21	04.01	
	15.15	18	12.33 (2)	16.32	13	14.37 (1)	17.52	32	10.06 (5)	20.16	21.38	22.59
2	09.54	12.16 (2)	08.57		14.21 (1)	07.34		09.34 (5)	06.53	05.18	03.59	
	15.17	18	12.34 (2)	16.35	19	14.40 (1)	17.55	30	10.04 (5)	20.19	21.41	23.01
3	09.53	12.15 (2)	08.54		14.19 (1)	07.31		09.35 (5)	06.50	05.15	03.57	
	15.18	19	12.34 (2)	16.37	23	14.42 (1)	17.58	29	10.04 (5)	20.22	21.44	23.03
4	09.53	12.15 (2)	08.51		14.18 (1)	07.28		09.36 (5)	06.47	05.12	03.55	
	15.20	20	12.35 (2)	16.40	25	14.43 (1)	18.01	26	10.02 (5)	20.24	21.47	23.05
5	09.52	12.17 (2)	08.49		14.17 (1)	07.24		09.37 (5)	06.44	05.09	03.54	
	15.22	19	12.36 (2)	16.43	28	14.45 (1)	18.03	23	10.00 (5)	20.27	21.49	23.07
6	09.51	12.17 (2)	08.46		14.16 (1)	07.21		09.39 (5)	06.40	05.06	03.52	
	15.24	20	12.37 (2)	16.46	30	14.46 (1)	18.06	19	09.58 (5)	20.30	21.52	23.09
7	09.50	12.16 (2)	08.43		14.15 (1)	07.18		09.42 (5)	06.37	05.03	03.51	
	15.26	20	12.36 (2)	16.49	33	14.48 (1)	18.09	12	09.54 (5)	20.32	21.55	23.11
8	09.48	12.17 (2)	08.40		14.14 (1)	07.15		06.34	05.00	03.49		
	15.28	20	12.37 (2)	16.52	34	14.48 (1)	18.12		20.35	21.58	23.13	
9	09.47	12.17 (2)	08.37		14.14 (1)	07.12		06.31	04.57	03.48		
	15.30	21	12.38 (2)	16.55	35	14.49 (1)	18.14		20.38	22.00	23.14	
10	09.46	12.18 (2)	08.35		14.13 (1)	07.08		06.27	04.55	03.47		
	15.32	20	12.38 (2)	16.58	37	14.50 (1)	18.17		20.40	22.03	23.16	
11	09.44	12.18 (2)	08.32		14.13 (1)	07.05		06.24	04.52	03.46		
	15.35	20	12.38 (2)	17.01	37	14.50 (1)	18.20		20.43	22.06	23.17	
12	09.43	12.19 (2)	08.29		14.12 (1)	07.02		06.21	04.49	03.45		
	15.37	20	12.39 (2)	17.04	38	14.50 (1)	18.23		20.46	22.09	23.18	
13	09.41	12.19 (2)	08.26		09.48 (5)	06.59		06.18	04.46	03.44		
	15.39	20	12.39 (2)	17.07	44	14.50 (1)	18.25		20.49	22.12	23.20	
14	09.39	12.20 (2)	08.23		09.44 (5)	06.55		06.15	04.43	03.43		
	15.42	20	12.40 (2)	17.10	54	14.51 (1)	18.28		20.51	22.14	23.21	
15	09.38	12.20 (2)	08.20		09.42 (5)	06.52		06.11	04.41	03.42		
	15.44	20	12.40 (2)	17.13	57	14.51 (1)	18.31		20.54	22.17	23.22	
16	09.36	12.21 (2)	08.17		09.39 (5)	06.49		06.08	04.38	03.42		
	15.47	18	12.39 (2)	17.15	61	14.50 (1)	18.33		20.57	22.20	23.23	
17	09.34	12.22 (2)	08.14		09.38 (5)	06.46		06.05	04.35	03.41		
	15.50	18	12.40 (2)	17.18	64	14.50 (1)	18.36		20.59	22.22	23.23	
18	09.32	12.23 (2)	08.11		09.37 (5)	06.42		06.02	04.33	03.41		
	15.52	17	12.40 (2)	17.21	65	14.50 (1)	18.39		21.02	22.25	23.24	
19	09.30	12.24 (2)	08.08		09.36 (5)	06.39		05.59	04.30	03.41		
	15.55	15	12.39 (2)	17.24	66	14.50 (1)	18.41		21.05	22.28	23.25	
20	09.28	12.25 (2)	08.05		09.35 (5)	06.36		05.55	04.27	03.41		
	15.58	13	12.38 (2)	17.27	67	14.49 (1)	18.44		21.08	22.30	23.25	
21	09.26	12.26 (2)	08.02		09.34 (5)	06.33		05.52	04.25	03.41		
	16.00	11	12.37 (2)	17.30	67	14.48 (1)	18.47		21.10	22.33	23.25	
22	09.24	12.28 (2)	07.59		09.34 (5)	06.29		05.49	04.23	03.41		
	16.03	8	12.36 (2)	17.33	65	14.47 (1)	18.49		21.13	22.36	23.26	
23	09.21		07.56		09.33 (5)	06.26		05.46	04.20	03.41		
	16.06		17.35		63	14.45 (1)	18.52		21.16	22.38	23.26	
24	09.19		07.53		09.33 (5)	06.23		05.43	04.18	03.42		
	16.09		17.38		61	14.44 (1)	18.55		21.19	22.41	23.26	
25	09.17		07.50		09.33 (5)	06.20		05.40	04.15	03.42		
	16.11		17.41		58	14.43 (1)	18.57		21.21	22.43	23.25	
26	09.14		07.46		09.32 (5)	06.16		05.37	04.13	03.43		
	16.14		17.44		52	14.39 (1)	19.00		21.24	22.46	23.25	
27	09.12		07.43		09.33 (5)	06.13		05.33	04.11	03.43		
	16.17		17.47		42	14.35 (1)	19.03		21.27	22.48	23.25	
28	09.10		07.40		09.33 (5)	06.10		05.30	04.09	03.44		
	16.20		17.50		34	10.07 (5)	19.05		21.30	22.50	23.24	
29	09.07					07.07		05.27	04.07	03.45		
	16.23					20.08		21.33	22.53	23.24		
30	09.04					07.03		05.24	04.04	03.46		
	16.26					20.11		21.35	22.55	23.23		
31	09.02	14.28 (1)				07.00			04.03			
	16.29	3	14.31 (1)			20.13			22.57			
Potential sun hours	194		247			364		443	547	586		
Total, worst case	398		1272			171						
Sun reduction	0,16		0,32			0,36						
Oper. time red.	0,88		0,88			0,88						
Wind dir. red.	0,68		0,65			0,62						
Total reduction	0,10		0,18			0,20						
Total, real	38		235			34						

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: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.47	04.55	06.18	07.36	08.00	13.43 (1) 09.22 12.00 (2)
	23.22	22.19	20.44	19.06	16.29 36	14.19 (1) 15.18 20 12.20 (2)
2	03.49	04.58	06.21	07.38	08.03	13.43 (1) 09.25 12.00 (2)
	23.21	22.16	20.40	19.02	16.26 35	14.18 (1) 15.16 21 12.21 (2)
3	03.50	05.00	06.23	07.41	08.06	13.44 (1) 09.27 12.01 (2)
	23.20	22.13	20.37	18.59	16.23 34	14.18 (1) 15.15 20 12.21 (2)
4	03.51	05.03	06.26	07.44	08.09	13.45 (1) 09.29 12.01 (2)
	23.19	22.10	20.34	18.56	16.20 32	14.17 (1) 15.13 20 12.21 (2)
5	03.53	05.06	06.29	07.46	08.12	13.46 (1) 09.31 12.02 (2)
	23.18	22.07	20.31	18.53	16.18 30	14.16 (1) 15.12 19 12.21 (2)
6	03.54	05.08	06.31	07.49	10.20 (5) 08.14	13.46 (1) 09.33 12.02 (2)
	23.16	22.04	20.27	18.49	7 10.27 (5) 16.15 29	14.15 (1) 15.11 20 12.22 (2)
7	03.56	05.11	06.34	07.52	10.16 (5) 08.17	13.48 (1) 09.35 12.03 (2)
	23.15	22.02	20.24	18.46	16 10.32 (5) 16.12 26	14.14 (1) 15.09 19 12.22 (2)
8	03.58	05.14	06.36	07.54	10.13 (5) 08.20	13.50 (1) 09.37 12.04 (2)
	23.14	21.59	20.21	18.43	21 10.34 (5) 16.09 22	14.12 (1) 15.08 19 12.23 (2)
9	04.00	05.17	06.39	07.57	10.12 (5) 08.23	13.51 (1) 09.39 12.05 (2)
	23.12	21.56	20.17	18.40	24 10.36 (5) 16.07 19	14.10 (1) 15.07 18 12.23 (2)
10	04.02	05.19	06.42	08.00	10.09 (5) 08.26	13.55 (1) 09.41 12.05 (2)
	23.10	21.53	20.14	18.37	28 10.37 (5) 16.04 13	14.08 (1) 15.07 18 12.23 (2)
11	04.04	05.22	06.44	08.02	10.08 (5) 08.29	13.56 (1) 09.43 12.05 (2)
	23.09	21.50	20.11	18.33	30 10.38 (5) 16.01	15.06 18 12.23 (2)
12	04.06	05.25	06.47	08.05	10.07 (5) 08.32	13.57 (1) 09.44 12.06 (2)
	23.07	21.47	20.08	18.30	31 10.38 (5) 15.59	15.05 18 12.24 (2)
13	04.08	05.27	06.49	08.08	10.07 (5) 08.34	13.58 (1) 09.46 12.07 (2)
	23.05	21.44	20.04	18.27	32 10.39 (5) 15.56	15.05 17 12.24 (2)
14	04.10	05.30	06.52	08.10	10.06 (5) 08.37	13.59 (1) 09.47 12.07 (2)
	23.03	21.40	20.01	18.24	33 10.39 (5) 15.54	15.04 17 12.24 (2)
15	04.12	05.33	06.55	08.13	10.06 (5) 08.40	13.60 (1) 09.49 12.08 (2)
	23.01	21.37	19.58	18.21	46 15.10 (1) 15.51	15.04 17 12.25 (2)
16	04.14	05.36	06.57	08.16	10.05 (5) 08.43	13.61 (1) 09.50 12.08 (2)
	22.59	21.34	19.55	18.18	54 15.13 (1) 15.49	15.03 16 12.24 (2)
17	04.17	05.38	07.00	08.18	10.05 (5) 08.46	13.62 (1) 09.51 12.09 (2)
	22.57	21.31	19.51	18.14	59 15.15 (1) 15.46	15.03 16 12.25 (2)
18	04.19	05.41	07.02	08.21	10.05 (5) 08.49	13.63 (1) 09.52 12.10 (2)
	22.54	21.28	19.48	18.11	62 15.17 (1) 15.44	15.03 15 12.25 (2)
19	04.21	05.44	07.05	08.24	10.05 (5) 08.51	13.64 (1) 09.53 12.11 (2)
	22.52	21.25	19.45	18.08	64 15.18 (1) 15.41	15.03 16 12.26 (2)
20	04.24	05.46	07.07	08.27	10.05 (5) 08.54	13.65 (1) 09.54 12.11 (2)
	22.50	21.22	19.41	18.05	67 15.19 (1) 15.39	12.11 (2) 15.04 15 12.26 (2)
21	04.26	05.49	07.10	08.29	10.05 (5) 08.57	13.66 (1) 09.54 12.12 (2)
	22.47	21.19	19.38	18.02	67 15.19 (1) 15.37	11 12.13 (2) 15.04 16 12.27 (2)
22	04.29	05.52	07.13	08.32	10.06 (5) 08.59	13.67 (1) 09.55 12.12 (2)
	22.45	21.16	19.35	17.59	67 15.20 (1) 15.35	13 12.14 (2) 15.04 16 12.27 (2)
23	04.31	05.54	07.15	08.35	10.06 (5) 09.02	13.68 (1) 09.55 12.13 (2)
	22.43	21.12	19.32	17.56	66 15.20 (1) 15.33	15 12.16 (2) 15.05 15 12.28 (2)
24	04.34	05.57	07.18	08.38	10.07 (5) 09.05	13.69 (1) 09.56 12.13 (2)
	22.40	21.09	19.28	17.53	65 15.20 (1) 15.30	17 12.17 (2) 15.05 15 12.28 (2)
25	04.36	06.00	07.20	07.40	09.08 (5) 09.07	13.70 (1) 09.56 12.13 (2)
	22.38	21.06	19.25	16.50	64 14.20 (1) 15.28	18 12.17 (2) 15.06 16 12.29 (2)
26	04.39	06.02	07.23	07.43	09.10 (5) 09.10	13.71 (1) 09.56 12.13 (2)
	22.35	21.03	19.22	16.47	60 14.20 (1) 15.26	18 12.18 (2) 15.07 16 12.29 (2)
27	04.42	06.05	07.25	07.46	09.11 (5) 09.13	13.72 (1) 09.56 12.14 (2)
	22.32	21.00	19.19	16.44	57 14.20 (1) 15.25	20 12.19 (2) 15.08 16 12.30 (2)
28	04.44	06.08	07.28	07.49	09.14 (5) 09.15	13.73 (1) 09.56 12.14 (2)
	22.30	20.56	19.15	16.41	51 14.20 (1) 15.23	20 12.19 (2) 15.09 16 12.30 (2)
29	04.47	06.10	07.31	07.52	09.19 (5) 09.18	13.74 (1) 09.56 12.14 (2)
	22.27	20.53	19.12	16.38	41 14.20 (1) 15.21	20 12.20 (2) 15.10 17 12.31 (2)
30	04.50	06.13	07.33	07.55	13.43 (1) 09.20	13.75 (1) 09.56 12.14 (2)
	22.24	20.50	19.09	16.35	37 14.20 (1) 15.19	20 12.20 (2) 15.12 17 12.31 (2)
31	04.52	06.16	07.36	07.57	13.43 (1) 09.21	13.76 (1) 09.56 12.15 (2)
	22.22	20.47	19.06	16.32	37 14.20 (1) 15.18	17 12.20 (2) 15.13 17 12.32 (2)
Potential sun hours	579	495	390	311	215	166
Total, worst case				1186	456	536
Sun reduction				0,25	0,16	0,11
Oper. time red.				0,88	0,88	0,88
Wind dir. red.				0,64	0,67	0,68
Total reduction				0,14	0,10	0,07
Total, real				171	44	35

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: Paholammi_VE1_Shadow__Forest_20211129 **Shadow receptor:** K - Asuinrakennus K, ~Seppäkoskentie 36
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.00	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.48	04.58	06.21	07.38	08.03	09.25
	15.16	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.14
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.04	20.27	18.49	16.15	15.10
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.56	20.17	18.40	16.07	15.07
10	09.46	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46
	15.39	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	15.04
15	09.38	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.49
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.49	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.35	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.41	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.50	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.24	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

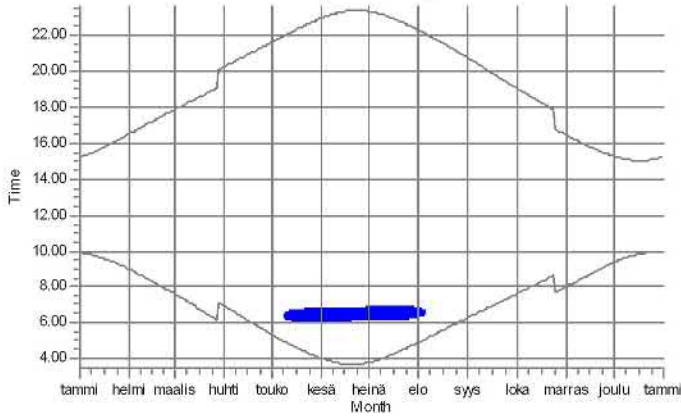
Table layout: For each day in each month the following matrix apply

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		

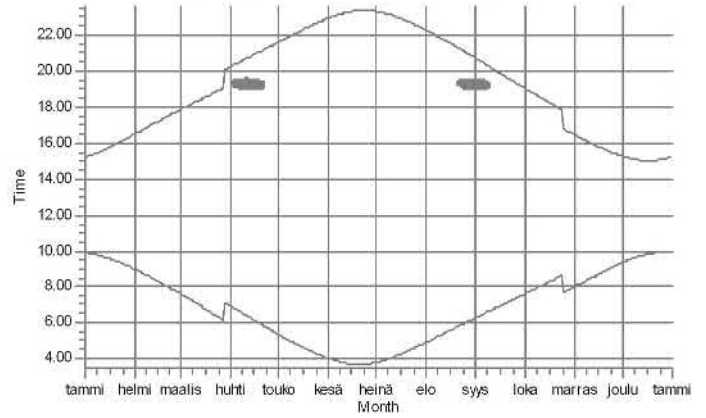
SHADOW - Calendar, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

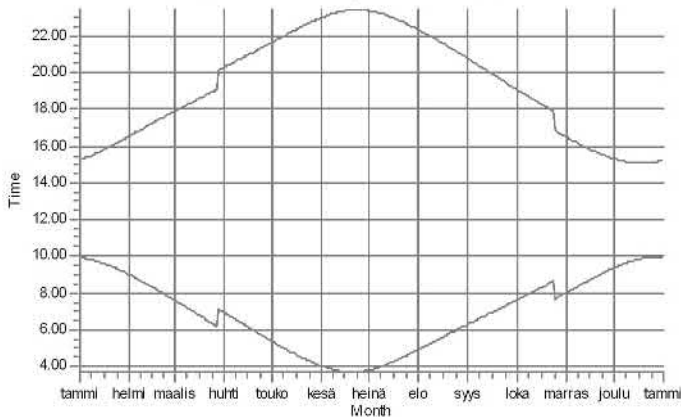
A: Asuinrakennus A, ~Kankaanpääntie 534



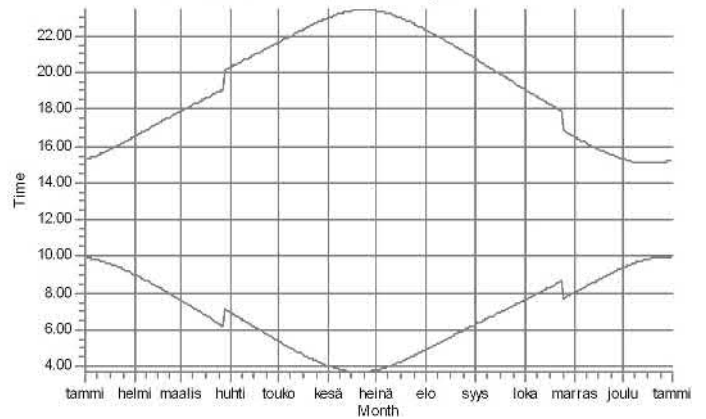
B: Asuinrakennus B, ~Ristiläntie 459



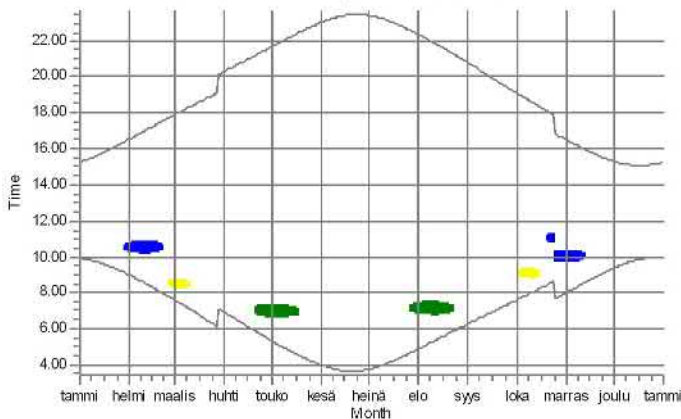
C: Lomarakennus C, ~Variksentie 93



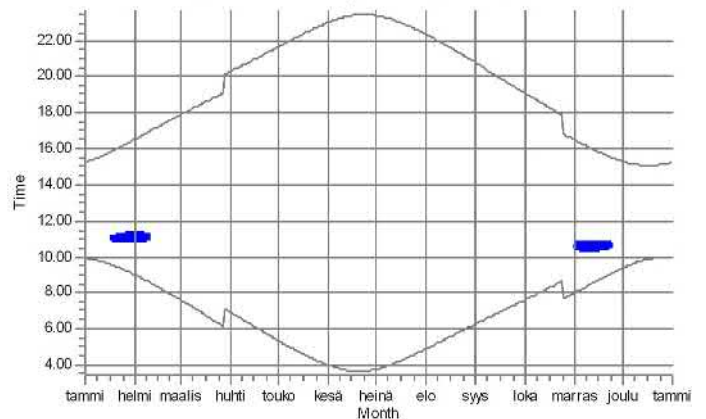
D: Asuinrakennus D, ~Kankaanpääntie 646



E: Asuinrakennus E, ~Välisalon tie 130



F: Asuinrakennus F, ~Välisalon tie 101



WTGs

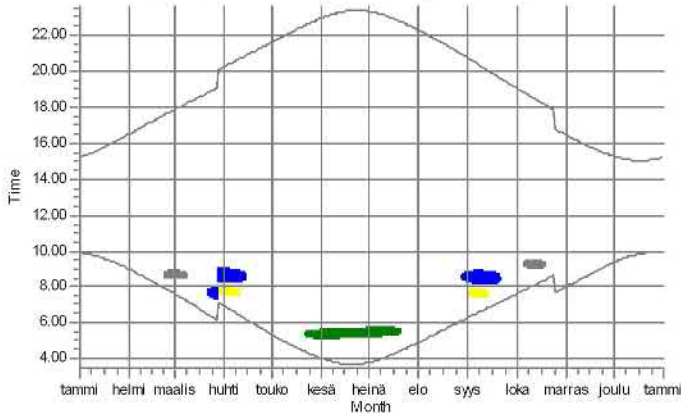
- 1: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (689)
- 2: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (690)

- 3: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (691)
- 4: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (692)

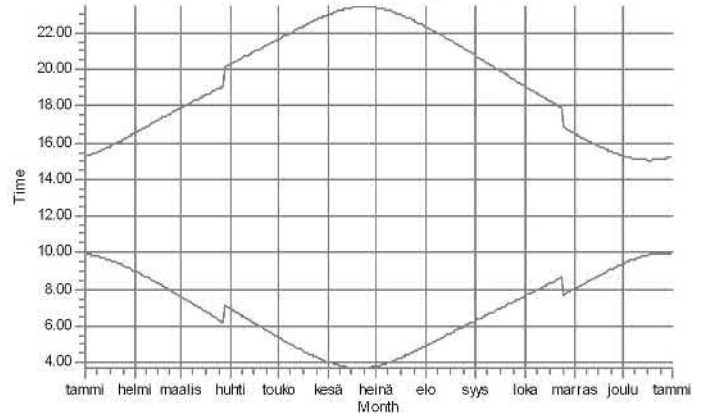
SHADOW - Calendar, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

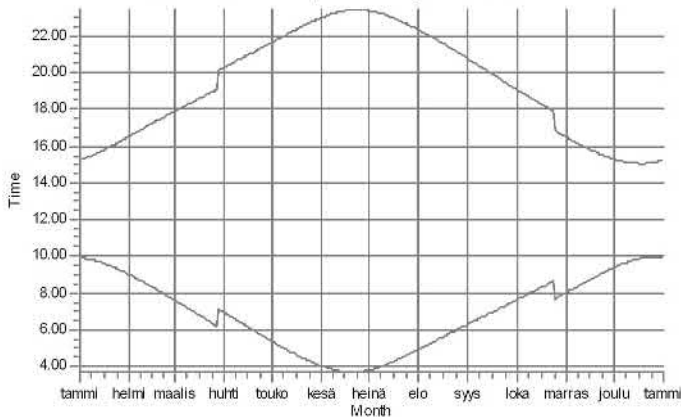
G: Asuinrakennus G, ~Kankaanpääntie 468



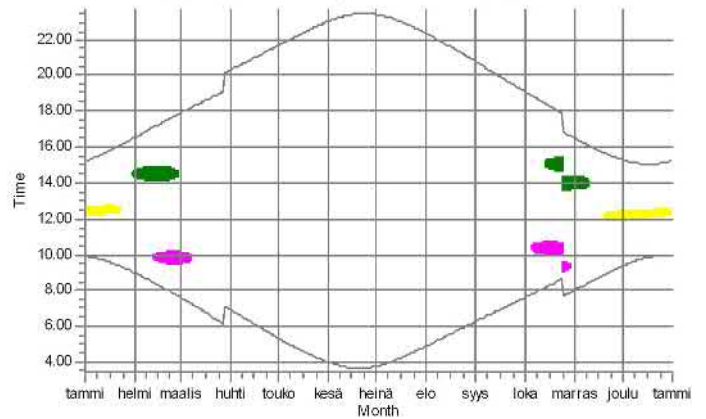
H: Lomarakennus H, ~Kankaanpääntie 320



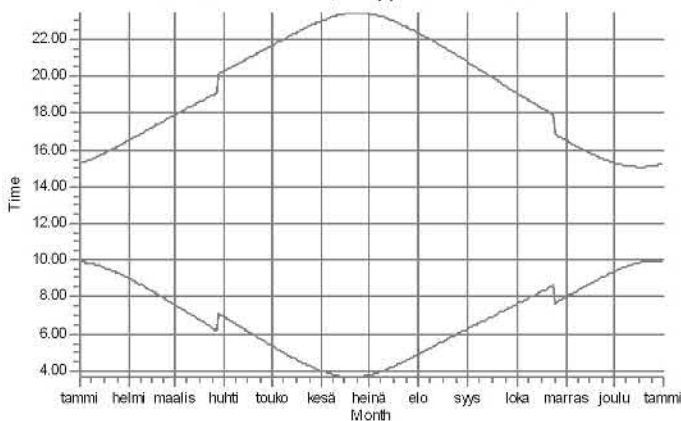
I: Asuinrakennus I, ~Kankaanpääntie 218



J: Asuinrakennus J, ~Penkkinevantie 85



K: Asuinrakennus K, ~Seppäkoskentie 36



WTGs

- 1: VESTAS V162-6.0 HH169 6000 162.0 !0! hub: 219,0 m (TOT: 300,0 m) (689)
- 2: VESTAS V162-6.0 HH169 6000 162.0 !0! hub: 219,0 m (TOT: 300,0 m) (690)
- 3: VESTAS V162-6.0 HH169 6000 162.0 !0! hub: 219,0 m (TOT: 300,0 m) (691)

- 4: VESTAS V162-6.0 HH169 6000 162.0 !0! hub: 219,0 m (TOT: 300,0 m) (692)
- 5: VESTAS V162-6.0 HH169 6000 162.0 !0! hub: 219,0 m (TOT: 300,0 m) (693)

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 1 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 14.24-14.37/13 16.32	07.37 17.52	06.57 20.16	05.21 06.47-07.20/33 21.38	04.01 05.13-05.33/20 22.59
2	09.54 15.17	08.57 14.21-14.40/19 16.35	07.34 17.55	06.54 20.19	05.18 06.47-07.20/33 21.41	03.59 05.12-05.33/21 23.01
3	09.53 15.18	08.54 14.19-14.42/23 16.38	07.31 17.58	06.50 20.22	05.15 06.46-07.19/33 21.44	03.57 05.12-05.33/21 23.03
4	09.53 15.20	08.51 14.18-14.43/25 16.40	07.28 18.01	06.47 20.24	05.12 06.47-07.20/33 21.47	03.55 05.12-05.34/22 23.05
5	09.52 15.22	08.49 14.17-14.45/28 16.43	07.24 18.03	06.44 20.27	05.09 06.47-07.19/32 21.49	03.54 05.13-05.34/21 23.07
6	09.51 15.24	08.46 14.16-14.46/30 16.46	07.21 18.06	06.41 20.30	05.06 06.46-07.18/32 21.52	03.52 05.13-05.35/22 23.09
7	09.49 15.26	08.43 14.15-14.48/33 16.49	07.18 18.09	06.37 20.32	05.03 06.47-07.18/31 21.55	03.51 05.13-05.35/22 23.11
8	09.48 15.28	08.40 14.14-14.48/34 16.52	07.15 18.12	06.34 20.35	05.00 06.47-07.17/30 21.58	03.49 05.13-05.35/22 23.13
9	09.47 15.30	08.37 14.14-14.49/35 16.55	07.12 18.14	06.31 20.38	04.58 06.48-07.17/29 22.00	03.48 05.13-05.35/22 23.14
10	09.46 15.32	08.35 14.13-14.50/37 16.58	07.08 18.17	06.28 20.40	04.55 06.48-07.16/28 22.03	03.47 05.13-05.35/22 23.16
11	09.44 15.35	08.32 14.13-14.50/37 17.01	07.05 18.20	06.24 20.43	04.52 06.49-07.15/26 22.06	03.46 05.14-05.36/22 23.17
12	09.43 15.37	08.29 14.12-14.50/38 17.04	07.02 18.23	06.21 20.46	04.49 06.50-07.14/24 22.09	03.45 05.13-05.36/23 23.18
13	09.41 15.40	08.26 14.12-14.50/38 17.07	06.59 18.25	06.18 20.49	04.46 06.51-07.13/22 22.11	03.44 05.14-05.36/22 23.20
14	09.39 15.42	08.23 14.12-14.51/39 17.10	06.55 18.28	06.15 20.51	04.43 06.52-07.12/20 22.14	03.43 05.14-05.36/22 23.21
15	09.38 15.44	08.20 14.13-14.51/38 17.13	06.52 18.31	06.11 20.54	04.41 06.53-07.10/17 22.17	03.42 05.14-05.37/23 23.22
16	09.36 15.47	08.17 14.12-14.50/38 17.15	06.49 18.33	06.08 20.57	04.38 06.55-07.08/13 22.20	03.42 05.15-05.37/22 23.22
17	09.34 15.50	08.14 14.12-14.50/38 17.18	06.46 18.36	06.05 20.59	04.35 06.58-07.05/7 22.22	03.42 05.14-05.36/22 23.23
18	09.32 15.52	08.11 14.13-14.50/37 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 05.15-05.37/22 23.24
19	09.30 15.55	08.08 14.14-14.50/36 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 05.15-05.37/22 23.24
20	09.28 15.58	08.05 14.13-14.49/36 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 05.15-05.37/22 23.25
21	09.26 16.00	08.02 14.14-14.48/34 17.30	06.33 18.47	05.52 06.59-07.11/12 21.10	04.25 22.33	03.41 05.16-05.38/22 23.25
22	09.24 16.03	07.59 14.16-14.47/31 17.33	06.29 18.49	05.49 06.56-07.13/17 21.13	04.23 22.35	03.41 05.16-05.38/22 23.25
23	09.21 16.06	07.56 14.16-14.45/29 17.35	06.26 18.52	05.46 06.54-07.15/21 21.16	04.20 05.20-05.25/5 22.38	03.41 05.16-05.38/22 23.26
24	09.19 16.09	07.53 14.18-14.44/26 17.38	06.23 18.55	05.43 06.52-07.16/24 21.19	04.18 05.18-05.27/9 22.41	03.42 05.16-05.38/22 23.25
25	09.17 16.12	07.50 14.20-14.43/23 17.41	06.20 18.57	05.40 06.51-07.18/27 21.21	04.15 05.16-05.28/12 22.43	03.42 05.16-05.38/22 23.25
26	09.14 16.14	07.46 14.22-14.39/17 17.44	06.16 19.00	05.37 06.50-07.18/28 21.24	04.13 05.15-05.29/14 22.45	03.43 05.17-05.39/22 23.25
27	09.12 16.17	07.43 14.27-14.35/8 17.47	06.13 19.03	05.34 06.49-07.19/30 21.27	04.11 05.14-05.30/16 22.48	03.44 05.17-05.39/22 23.25
28	09.09 16.20	07.40 17.50	06.10 19.05	05.30 06.48-07.19/31 21.30	04.09 05.14-05.31/17 22.50	03.44 05.17-05.39/22 23.24
29	09.07 16.23		07.07 20.08	05.27 06.47-07.19/32 21.33	04.07 05.13-05.31/18 22.53	03.45 05.17-05.40/23 23.24
30	09.04 16.26		07.03 20.11	05.24 06.47-07.19/32 21.35	04.05 05.13-05.32/19 22.55	03.46 05.18-05.40/22 23.23
31	09.02 14.28-14.31/3 16.29		07.00 20.14		04.03 05.12-05.32/20 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	3	820	0	254	573	658

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 1 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (689)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.47	05.18-05.40/22	04.55	07.00-07.25/25	06.18	07.36	08.00	13.43-14.19/36	09.22			
	23.22		22.19		20.44	19.06	16.29		15.18			
2	03.49	05.18-05.40/22	04.58	06.59-07.26/27	06.21	07.39	08.03	13.43-14.18/35	09.25			
	23.21		22.16		20.40	19.02	16.26		15.16			
3	03.50	05.18-05.40/22	05.00	06.58-07.26/28	06.23	07.41	08.06	13.44-14.18/34	09.27			
	23.20		22.13		20.37	18.59	16.23		15.15			
4	03.51	05.18-05.40/22	05.03	06.58-07.28/30	06.26	07.44	08.09	13.45-14.17/32	09.29			
	23.19		22.10		20.34	18.56	16.20		15.13			
5	03.53	05.18-05.40/22	05.06	06.57-07.28/31	06.29	07.46	08.12	13.46-14.16/30	09.31			
	23.18		22.07		20.31	18.53	16.18		15.12			
6	03.55	05.18-05.40/22	05.09	06.56-07.28/32	06.31	07.49	08.14	13.46-14.15/29	09.33			
	23.16		22.04		20.27	18.49	16.15		15.11			
7	03.56	05.19-05.41/22	05.11	06.56-07.28/32	06.34	07.52	08.17	13.48-14.14/26	09.35			
	23.15		22.01		20.24	18.46	16.12		15.10			
8	03.58	05.19-05.41/22	05.14	06.56-07.28/32	06.37	07.54	08.20	13.50-14.12/22	09.37			
	23.13		21.59		20.21	18.43	16.09		15.08			
9	04.00	05.20-05.41/21	05.17	06.56-07.29/33	06.39	07.57	08.23	13.51-14.10/19	09.39			
	23.12		21.56		20.17	18.40	16.07		15.07			
10	04.02	05.20-05.40/20	05.19	06.55-07.28/33	06.42	08.00	08.26	13.55-14.08/13	09.41			
	23.10		21.53		20.14	18.37	16.04		15.07			
11	04.04	05.20-05.41/21	05.22	06.55-07.28/33	06.44	08.02	08.29		09.43			
	23.08		21.50		20.11	18.33	16.01		15.06			
12	04.06	05.21-05.41/20	05.25	06.55-07.28/33	06.47	08.05	08.32		09.44			
	23.07		21.47		20.08	18.30	15.59		15.05			
13	04.08	05.21-05.40/19	05.28	06.55-07.27/32	06.49	08.08	08.34		09.46			
	23.05		21.44		20.04	18.27	15.56		15.05			
14	04.10	05.22-05.40/18	05.30	06.56-07.27/31	06.52	08.10	08.37		09.47			
	23.03		21.40		20.01	18.24	15.54		15.04			
15	04.12	05.22-05.40/18	05.33	06.56-07.26/30	06.55	08.13	14.58-15.10/12	08.40	09.49			
	23.01		21.37		19.58	18.21	15.51		15.04			
16	04.15	05.23-05.40/17	05.36	06.57-07.26/29	06.57	08.16	14.54-15.13/19	08.43	09.50			
	22.59		21.34		19.55	18.18	15.49		15.04			
17	04.17	05.24-05.39/15	05.38	06.57-07.25/28	07.00	08.18	14.51-15.15/24	08.46	09.51			
	22.57		21.31		19.51	18.14	15.46		15.03			
18	04.19	05.24-05.38/14	05.41	06.57-07.23/26	07.02	08.21	14.49-15.17/28	08.48	09.52			
	22.54		21.28		19.48	18.11	15.44		15.03			
19	04.22	05.26-05.37/11	05.44	06.59-07.22/23	07.05	08.24	14.48-15.18/30	08.51	09.53			
	22.52		21.25		19.45	18.08	15.41		15.04			
20	04.24	05.28-05.35/7	05.46	06.59-07.20/21	07.07	08.27	14.46-15.19/33	08.54	09.54			
	22.50		21.22		19.41	18.05	15.39		15.04			
21	04.26		05.49	07.02-07.19/17	07.10	08.29	14.45-15.19/34	08.57	09.54			
	22.47		21.19		19.38	18.02	15.37		15.04			
22	04.29		05.52	07.04-07.15/11	07.13	08.32	14.44-15.20/36	08.59	09.55			
	22.45		21.16		19.35	17.59	15.35		15.04			
23	04.31		05.54		07.15	08.35	14.44-15.20/36	09.02	09.55			
	22.43		21.12		19.32	17.56	15.33		15.05			
24	04.34		05.57		07.18	08.38	14.43-15.20/37	09.05	09.56			
	22.40		21.09		19.28	17.53	15.31		15.06			
25	04.37		06.00		07.20	07.40	13.42-14.20/38	09.07	09.56			
	22.37		21.06		19.25	16.50	15.29		15.06			
26	04.39		06.02		07.23	07.43	13.42-14.20/38	09.10	09.56			
	22.35		21.03		19.22	16.47	15.27		15.07			
27	04.42	07.07-07.17/10	06.05		07.26	07.46	13.42-14.20/38	09.13	09.56			
	22.32		21.00		19.19	16.44	15.25		15.08			
28	04.44	07.04-07.19/15	06.08		07.28	07.49	13.42-14.20/38	09.15	09.56			
	22.30		20.56		19.15	16.41	15.23		15.09			
29	04.47	07.04-07.21/17	06.10		07.31	07.52	13.42-14.20/38	09.18	09.56			
	22.27		20.53		19.12	16.38	15.21		15.11			
30	04.50	07.02-07.23/21	06.13		07.33	07.55	13.43-14.20/37	09.20	09.56			
	22.24		20.50		19.09	16.35	15.19		15.12			
31	04.52	07.01-07.24/23	06.16			07.57	13.43-14.20/37		09.55			
	22.21		20.47			16.32			15.13			
Potential sun hours	579		495		390	311	215	276	166			0
Sum of minutes with flicker	463		617		0	553						

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 2 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 12.15-12.33/18 15.15	08.59 16.32	07.37 08.24-08.42/18 17.52	06.57 07.38-07.54/16 20.16	05.21 21.38	04.01 22.59
2	09.54 12.16-12.34/18 15.17	08.57 16.35	07.34 08.23-08.41/18 17.55	06.54 07.36-07.54/18 20.19	05.18 21.41	03.59 23.01
3	09.53 12.15-12.34/19 15.18	08.54 16.38	07.31 08.22-08.42/20 17.58	06.50 07.35-07.54/19 20.21	05.15 21.44	03.57 23.03
4	09.52 12.15-12.35/20 15.20	08.51 16.40	07.28 08.22-08.42/20 18.01	06.47 07.35-07.54/19 20.24	05.12 21.46	03.55 23.05
5	09.51 12.17-12.36/19 15.22	08.48 16.43	07.24 08.21-08.42/21 18.03	06.44 07.35-07.54/19 20.27	05.09 21.49	03.54 23.07
6	09.50 12.17-12.37/20 15.24	08.46 16.46	07.21 08.22-08.41/19 18.06	06.40 07.35-07.54/19 20.30	05.06 21.52	03.52 23.09
7	09.49 12.16-12.36/20 15.26	08.43 16.49	07.18 08.22-08.41/19 18.09	06.37 07.35-07.52/17 20.32	05.03 21.55	03.51 23.11
8	09.48 12.17-12.37/20 15.28	08.40 16.52	07.15 08.22-08.39/17 18.12	06.34 07.35-07.51/16 20.35	05.00 21.58	03.50 23.12
9	09.47 12.17-12.38/21 15.30	08.37 16.55	07.12 08.24-08.38/14 18.14	06.31 07.36-07.50/14 20.38	04.58 22.00	03.48 23.14
10	09.45 12.18-12.38/20 15.33	08.34 16.58	07.08 08.26-08.36/10 18.17	06.28 07.38-07.47/9 20.40	04.55 22.03	03.47 23.15
11	09.44 12.18-12.38/20 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17
12	09.42 12.19-12.39/20 15.37	08.29 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 23.18
13	09.41 12.19-12.39/20 15.40	08.26 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 23.19
14	09.39 12.20-12.40/20 15.42	08.23 17.10	06.55 18.28	06.15 20.51	04.44 22.14	03.43 23.20
15	09.37 12.20-12.40/20 15.45	08.20 17.13	06.52 18.31	06.11 20.54	04.41 22.17	03.43 23.21
16	09.36 12.21-12.39/18 15.47	08.17 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 23.22
17	09.34 12.22-12.40/18 15.50	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 23.23
18	09.32 12.23-12.40/17 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24
19	09.30 12.24-12.39/15 15.55	08.08 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 23.24
20	09.28 12.25-12.38/13 15.58	08.05 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 23.25
21	09.26 12.26-12.37/11 16.00	08.02 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 12.28-12.36/8 16.03	07.59 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 16.06	07.56 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.42 23.25
24	09.19 16.09	07.53 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 16.12	07.50 17.41	06.20 18.57	05.40 21.21	04.16 22.43	03.42 23.25
26	09.14 16.14	07.46 08.32-08.36/4 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 08.27-08.38/11 17.47	06.13 19.03	05.34 21.27	04.11 22.48	03.44 23.24
28	09.09 16.20	07.40 08.25-08.40/15 17.50	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24
29	09.07 16.23		07.07 20.08	05.27 21.32	04.07 22.52	03.45 23.23
30	09.04 16.26		07.03 07.42-07.51/9 20.11	05.24 21.35	04.05 22.55	03.46 23.23
31	09.02 16.29		07.00 07.39-07.53/14 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	395	30	199	166	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 2 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (690

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.22 12.00-12.20/20
	23.22	22.19	20.43	19.06	16.29	15.18
2	03.49	04.58	06.21 07.36-07.45/9	07.38	08.03	09.25 12.00-12.21/21
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.00	06.23 07.34-07.48/14	07.41 09.04-09.12/8	08.06	09.27 12.01-12.21/20
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.52	05.03	06.26 07.32-07.48/16	07.44 09.02-09.15/13	08.09	09.29 12.01-12.21/20
	23.19	22.10	20.34	18.56	16.21	15.13
5	03.53	05.06	06.29 07.32-07.49/17	07.46 09.00-09.16/16	08.12	09.31 12.02-12.21/19
	23.18	22.07	20.30	18.53	16.18	15.12
6	03.55	05.09	06.31 07.30-07.49/19	07.49 08.58-09.16/18	08.14	09.33 12.02-12.22/20
	23.16	22.04	20.27	18.49	16.15	15.11
7	03.56	05.11	06.34 07.30-07.49/19	07.52 08.58-09.17/19	08.17	09.35 12.03-12.22/19
	23.15	22.01	20.24	18.46	16.12	15.10
8	03.58	05.14	06.36 07.29-07.48/19	07.54 08.57-09.17/20	08.20	09.37 12.04-12.23/19
	23.13	21.58	20.21	18.43	16.09	15.09
9	04.00	05.17	06.39 07.30-07.48/18	07.57 08.57-09.17/20	08.23	09.39 12.05-12.23/18
	23.12	21.55	20.17	18.40	16.07	15.08
10	04.02	05.19	06.42 07.29-07.47/18	08.00 08.57-09.17/20	08.26	09.41 12.05-12.23/18
	23.10	21.52	20.14	18.37	16.04	15.07
11	04.04	05.22	06.44 07.30-07.46/16	08.02 08.56-09.16/20	08.29	09.43 12.05-12.23/18
	23.08	21.49	20.11	18.33	16.01	15.06
12	04.06	05.25	06.47 07.31-07.44/13	08.05 08.57-09.15/18	08.31	09.44 12.06-12.24/18
	23.06	21.46	20.08	18.30	15.59	15.05
13	04.08	05.28	06.49 07.33-07.42/9	08.08 08.58-09.14/16	08.34	09.46 12.07-12.24/17
	23.05	21.43	20.04	18.27	15.56	15.05
14	04.10	05.30	06.52	08.10 08.59-09.12/13	08.37	09.47 12.07-12.24/17
	23.03	21.40	20.01	18.24	15.54	15.04
15	04.12	05.33	06.55	08.13 09.01-09.10/9	08.40	09.48 12.08-12.25/17
	23.01	21.37	19.58	18.21	15.51	15.04
16	04.15	05.36	06.57	08.16	08.43	09.50 12.08-12.24/16
	22.59	21.34	19.55	18.18	15.49	15.04
17	04.17	05.38	07.00	08.18	08.46	09.51 12.09-12.25/16
	22.56	21.31	19.51	18.14	15.46	15.04
18	04.19	05.41	07.02	08.21	08.48	09.52 12.10-12.25/15
	22.54	21.28	19.48	18.11	15.44	15.03
19	04.22	05.44	07.05	08.24	08.51	09.53 12.10-12.26/16
	22.52	21.25	19.45	18.08	15.42	15.04
20	04.24	05.46	07.07	08.27	08.54 12.03-12.11/8	09.53 12.11-12.26/15
	22.50	21.22	19.41	18.05	15.39	15.04
21	04.27	05.49	07.10	08.29	08.57 12.02-12.13/11	09.54 12.11-12.27/16
	22.47	21.19	19.38	18.02	15.37	15.04
22	04.29	05.52	07.13	08.32	08.59 12.01-12.14/13	09.55 12.11-12.27/16
	22.45	21.15	19.35	17.59	15.35	15.05
23	04.32	05.54	07.15	08.35	09.02 12.01-12.16/15	09.55 12.13-12.28/15
	22.42	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57	07.18	08.38	09.05 12.00-12.17/17	09.56 12.13-12.28/15
	22.40	21.09	19.28	17.53	15.31	15.06
25	04.37	06.00	07.20	07.40	09.07 11.59-12.17/18	09.56 12.13-12.29/16
	22.37	21.06	19.25	16.50	15.29	15.06
26	04.39	06.02	07.23	07.43	09.10 12.00-12.18/18	09.56 12.13-12.29/16
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05	07.25	07.46	09.12 11.59-12.19/20	09.56 12.14-12.30/16
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.44	06.08	07.28	07.49	09.15 11.59-12.19/20	09.56 12.14-12.30/16
	22.30	20.56	19.15	16.41	15.23	15.09
29	04.47	06.10	07.31	07.52	09.17 12.00-12.20/20	09.56 12.14-12.31/17
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13	07.33	07.54	09.20 12.00-12.20/20	09.56 12.14-12.31/17
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16		07.57		09.55 12.15-12.32/17
	22.21	20.47		16.32		15.13
Potential sun hours	578	495	390	311	215	166
Sum of minutes with flicker	0	0	187	210	180	536

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-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 3 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 10.53-11.19/26 16.32 10.25-10.42/17	07.37 17.52	06.57 08.21-08.58/37 20.16	05.21 21.38	04.01 06.06-06.45/39 22.59
2	09.54 15.17	08.57 10.53-11.19/26 16.35 10.23-10.44/21	07.34 17.55	06.54 08.20-08.57/37 20.19	05.18 21.41	03.59 06.06-06.44/38 23.01
3	09.53 15.19	08.54 10.53-11.18/25 16.38 10.22-10.45/23	07.31 17.58	06.50 08.20-08.57/37 20.22	05.15 21.44	03.57 06.06-06.45/39 23.03
4	09.52 15.20	08.51 10.54-11.18/24 16.41 10.21-10.46/25	07.28 18.01	06.47 08.20-08.57/37 20.24	05.12 21.46	03.56 06.07-06.45/38 23.05
5	09.51 15.22	08.49 10.55-11.18/23 16.44 10.20-10.47/27	07.24 18.03	06.44 08.20-08.56/36 20.27	05.09 21.49	03.54 06.07-06.45/38 23.07
6	09.50 15.24	08.46 10.56-11.17/21 16.46 10.20-10.48/28	07.21 18.06	06.41 08.20-08.56/36 20.30	05.06 21.52	03.52 06.07-06.45/38 23.09
7	09.49 15.26	08.43 10.57-11.16/19 16.49 10.20-10.49/29	07.18 18.09	06.37 08.20-08.54/34 20.32	05.03 21.55	03.51 06.08-06.45/37 23.11
8	09.48 15.28	08.40 10.58-11.14/16 16.52 10.19-10.48/29	07.15 18.12	06.34 08.20-08.53/33 20.35	05.01 21.58	03.50 06.08-06.45/37 23.12
9	09.47 15.30	08.37 11.00-11.12/12 16.55 10.19-10.49/30	07.12 18.14	06.31 08.21-08.52/31 20.38	04.58 06.20-06.29/9 22.00	03.48 06.08-06.45/37 23.14
10	09.45 15.33	08.35 10.19-10.49/30 16.58	07.08 18.17	06.28 08.22-08.51/29 20.40	04.55 06.16-06.32/16 22.03	03.47 06.08-06.45/37 23.15
11	09.44 15.35	08.32 10.19-10.50/31 17.01	07.05 18.20	06.24 08.22-08.49/27 20.43	04.52 06.15-06.34/19 22.06	03.46 06.09-06.46/37 23.17
12	09.43 15.37	08.29 10.20-10.50/30 17.04	07.02 18.23	06.21 08.24-08.47/23 20.46	04.49 06.12-06.35/23 22.09	03.45 06.09-06.45/36 23.18
13	09.41 15.40	08.26 10.19-10.49/30 17.07	06.59 18.25	06.18 08.25-08.45/20 20.49	04.46 06.11-06.37/26 22.11	03.44 06.10-06.46/36 23.19
14	09.39 15.42	08.23 10.20-10.49/29 17.10	06.55 18.28	06.15 08.27-08.41/14 20.51	04.44 06.10-06.38/28 22.14	03.43 06.09-06.45/36 23.20
15	09.37 15.45	08.20 10.21-10.49/28 17.13	06.52 18.31	06.12 20.54	04.41 06.09-06.38/29 22.17	03.43 06.10-06.46/36 23.21
16	09.36 15.47	08.17 10.21-10.47/26 17.16	06.49 18.33	06.08 20.57	04.38 06.08-06.39/31 22.20	03.42 06.10-06.46/36 23.22
17	09.34 15.50	08.14 10.22-10.46/24 17.18	06.46 18.36	06.05 20.59	04.36 06.08-06.40/32 22.22	03.42 06.10-06.46/36 23.23
18	09.32 11.00-11.05/5 15.52	08.11 10.23-10.45/22 17.21	06.43 18.39	06.02 21.02	04.33 06.07-06.41/34 22.25	03.42 06.10-06.46/36 23.24
19	09.30 10.57-11.08/11 15.55	08.08 10.25-10.44/19 17.24	06.39 18.41	05.59 21.05	04.30 06.07-06.42/35 22.28	03.41 06.10-06.46/36 23.24
20	09.28 10.56-11.10/14 15.58	08.05 10.26-10.41/15 17.27	06.36 18.44	05.56 21.08	04.28 06.07-06.42/35 22.30	03.41 06.11-06.46/35 23.25
21	09.26 10.54-11.11/17 16.00	08.02 10.31-10.36/5 17.30	06.33 18.47	05.52 21.10	04.25 06.05-06.42/37 22.33	03.41 06.12-06.47/35 23.25
22	09.23 10.54-11.13/19 16.03	07.59 17.33	06.29 18.50	05.49 21.13	04.23 06.06-06.43/37 22.35	03.41 06.12-06.47/35 23.25
23	09.21 10.53-11.14/21 16.06	07.56 17.36	06.26 07.36-07.49/13 18.52	05.46 21.16	04.20 06.06-06.43/37 22.38	03.42 06.12-06.47/35 23.25
24	09.19 10.52-11.15/23 16.09	07.53 17.38	06.23 07.33-07.52/19 18.55	05.43 21.19	04.18 06.06-06.43/37 22.40	03.42 06.12-06.48/36 23.25
25	09.17 10.52-11.15/23 16.12	07.50 17.41	06.20 07.29-07.53/24 18.58	05.40 21.21	04.16 06.05-06.44/39 22.43	03.42 06.12-06.48/36 23.25
26	09.14 10.52-11.16/24 16.14	07.46 17.44	06.16 07.28-07.55/27 19.00	05.37 21.24	04.13 06.05-06.44/39 22.45	03.43 06.13-06.48/35 23.25
27	09.12 10.52-11.17/25 16.17	07.43 17.47	06.13 07.26-07.56/30 19.03	05.34 21.27	04.11 06.05-06.43/38 22.48	03.44 06.12-06.48/36 23.25
28	09.09 10.52-11.17/25 16.20	07.40 17.50	06.10 07.24-07.56/32 19.06	05.31 21.30	04.09 06.06-06.44/38 22.50	03.45 06.13-06.49/36 23.24
29	09.07 10.52-11.18/26 16.23		07.07 08.23-08.57/34 20.08	05.27 21.33	04.07 06.05-06.44/39 22.52	03.46 06.13-06.49/36 23.23
30	09.04 10.52-11.18/26 16.26 10.30-10.37/7		07.03 08.22-08.57/35 20.11	05.24 21.35	04.05 06.06-06.45/39 22.55	03.47 06.13-06.50/37 23.23
31	09.02 10.52-11.19/27 16.29 10.26-10.40/14		07.00 08.22-08.58/36 20.14		04.03 06.06-06.44/38 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	307	710	250	431	735	1095

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 3 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (691)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	July		August		September		October		November		December	
1	03.48	06.13-06.50/37	04.55	06.24-06.46/22	06.18	08.21-08.48/27	07.36	08.00	10.33-10.38/5	09.22		
	23.22		22.19		20.44		19.06	16.29	09.48-10.19/31	15.18		
2	03.49	06.13-06.50/37	04.58	06.26-06.44/18	06.21	08.19-08.49/30	07.39	08.03	10.29-10.42/13	09.25		
	23.21		22.16		20.40		19.02	16.26	09.48-10.18/30	15.16		
3	03.50	06.13-06.50/37	05.01	06.28-06.41/13	06.24	08.19-08.50/31	07.41	08.06	10.28-10.45/17	09.27		
	23.20		22.13		20.37		18.59	16.23	09.49-10.19/30	15.15		
4	03.52	06.13-06.51/38	05.03	06.33-06.37/4	06.26	08.17-08.50/33	07.44	08.09	10.26-10.46/20	09.29		
	23.19		22.10		20.34		18.56	16.21	09.49-10.18/29	15.13		
5	03.53	06.13-06.51/38	05.06		06.29	08.17-08.51/34	07.46	08.12	10.25-10.47/22	09.31		
	23.18		22.07		20.31		18.53	16.18	09.50-10.17/27	15.12		
6	03.55	06.13-06.51/38	05.09		06.31	08.15-08.51/36	07.49	08.14	10.24-10.47/23	09.33		
	23.16		22.04		20.27		18.49	16.15	09.50-10.16/26	15.11		
7	03.56	06.14-06.52/38	05.11		06.34	08.15-08.51/36	07.52	08.17	10.24-10.49/25	09.35		
	23.15		22.01		20.24		18.46	16.12	09.52-10.16/24	15.10		
8	03.58	06.13-06.51/38	05.14		06.37	08.14-08.51/37	07.54	08.20	10.24-10.49/25	09.37		
	23.13		21.59		20.21		18.43	16.09	09.52-10.15/23	15.09		
9	04.00	06.14-06.52/38	05.17		06.39	08.14-08.51/37	07.57	08.23	10.24-10.50/26	09.39		
	23.12		21.56		20.18		18.40	16.07	09.54-10.15/21	15.08		
10	04.02	06.13-06.52/39	05.20		06.42	08.13-08.50/37	08.00	08.26	10.23-10.50/27	09.41		
	23.10		21.53		20.14		18.37	16.04	09.56-10.13/17	15.07		
11	04.04	06.14-06.52/38	05.22		06.44	08.14-08.50/36	08.02	08.29	10.23-10.50/27	09.43		
	23.08		21.50		20.11		18.33	16.01	09.57-10.11/14	15.06		
12	04.06	06.14-06.53/39	05.25		06.47	08.13-08.49/36	08.05	08.32	10.24-10.50/26	09.44		
	23.07		21.47		20.08		18.30	15.59	10.02-10.08/6	15.05		
13	04.08	06.14-06.52/38	05.28		06.49	08.14-08.49/35	08.08	08.34	10.24-10.50/26	09.46		
	23.05		21.43		20.04		18.27	15.56		15.05		
14	04.10	06.14-06.53/39	05.30		06.52	08.13-08.47/34	08.10	08.37	10.25-10.50/25	09.47		
	23.03		21.40		20.01		18.24	15.54		15.04		
15	04.12	06.14-06.53/39	05.33		06.55	08.14-08.46/32	08.13	08.40	10.25-10.50/25	09.48		
	23.01		21.37		19.58		18.21	15.51		15.04		
16	04.15	06.15-06.53/38	05.36		06.57	08.14-08.45/31	08.16	08.43	10.25-10.49/24	09.50		
	22.59		21.34		19.55		18.18	15.49		15.04		
17	04.17	06.15-06.54/39	05.38		07.00	08.16-08.44/28	08.18	08.46	10.26-10.49/23	09.51		
	22.56		21.31		19.51		18.15	15.46		15.04		
18	04.19	06.14-06.53/39	05.41		07.02	08.17-08.41/24	08.21	08.48	10.26-10.49/23	09.52		
	22.54		21.28		19.48		18.11	15.44		15.04		
19	04.22	06.15-06.53/38	05.44		07.05	08.19-08.39/20	08.24	08.51	10.28-10.49/21	09.53		
	22.52		21.25		19.45		18.08	15.42		15.04		
20	04.24	06.15-06.52/37	05.47		07.07	08.21-08.36/15	08.27	08.54	10.29-10.48/19	09.54		
	22.50		21.22		19.42		18.05	15.39		15.04		
21	04.27	06.15-06.52/37	05.49		07.10	08.26-08.30/4	08.29	11.00-11.09/9	08.57	10.30-10.47/17	09.54	
	22.47		21.19		19.38		18.02	15.37		15.04		
22	04.29	06.16-06.53/37	05.52		07.13		08.32	10.57-11.12/15	08.59	10.32-10.46/14	09.55	
	22.45		21.16		19.35		17.59	15.35		15.05		
23	04.32	06.17-06.53/36	05.55		07.15		08.35	10.54-11.14/20	09.02	10.34-10.45/11	09.55	
	22.42		21.12		19.32		17.56	15.33		15.05		
24	04.34	06.17-06.52/35	05.57		07.18		08.38	10.53-11.16/23	09.05	10.37-10.42/5	09.56	
	22.40		21.09		19.28		17.53	15.31		15.06		
25	04.37	06.17-06.51/34	06.00		07.20		07.40	09.52-10.17/25	09.07		09.56	
	22.37		21.06		19.25		16.50	15.29		15.07		
26	04.39	06.18-06.51/33	06.03		07.23		07.43	09.51-10.17/26	09.10		09.56	
	22.35		21.03		19.22		16.47	15.27		15.07		
27	04.42	06.18-06.50/32	06.05		07.26		07.46	09.50-10.18/28	09.12		09.56	
	22.32		21.00		19.19		16.44	15.25		15.08		
28	04.45	06.20-06.50/30	06.08	08.34-08.37/3	07.28		07.49	09.49-10.18/29	09.15		09.56	
	22.30		20.56		19.15		16.41	15.23		15.10		
29	04.47	06.20-06.49/29	06.10	08.29-08.43/14	07.31		07.52	09.48-10.18/30	09.17		09.56	
	22.27		20.53		19.12		16.38	15.21		15.11		
30	04.50	06.21-06.48/27	06.13	08.25-08.45/20	07.33		07.55	09.49-10.19/30	09.20		09.56	
	22.24		20.50		19.09		16.35	15.19		15.12		
31	04.52	06.22-06.46/24	06.16	08.23-08.46/23			07.57	09.49-10.19/30			09.55	
	22.21		20.47				16.32				15.13	
Potential sun hours	578		495		390		311		215		167	
Sum of minutes with flicker	1116		117		633		265		767		0	

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 4 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.54 15.15	08.59 16.32	07.37 17.52	08.32-08.53/21 20.16	06.57 21.38	04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 17.55	08.31-08.52/21 20.19	06.54 21.41	03.59 23.01
3	09.53 15.19	08.54 16.38	07.31 17.58	08.32-08.52/20 20.22	06.50 21.44	03.57 23.03
4	09.52 15.20	08.51 16.41	07.28 18.01	08.32-08.51/19 20.24	06.47 21.46	03.56 23.05
5	09.51 15.22	08.48 16.43	07.24 18.03	08.32-08.50/18 20.27	06.44 21.49	03.54 23.07
6	09.50 15.24	08.46 16.46	07.21 18.06	08.33-08.49/16 20.30	06.41 21.52	03.52 23.09
7	09.49 15.26	08.43 16.49	07.18 18.09	08.35-08.47/12 20.32	06.37 21.55	03.51 23.11
8	09.48 15.28	08.40 16.52	07.15 18.12	08.37-08.43/6 20.35	06.34 21.58	03.50 23.12
9	09.47 15.30	08.37 16.55	07.12 18.14	07.12 20.38	06.31 22.00	03.48 23.14
10	09.45 15.33	08.34 16.58	07.08 18.17	06.28 20.40	19.05-19.32/27 22.03	03.47 23.15
11	09.44 15.35	08.32 17.01	07.05 18.20	06.24 20.43	19.04-19.33/29 22.06	03.46 23.17
12	09.42 15.37	08.29 17.04	07.02 18.23	06.21 20.46	19.03-19.31/28 22.09	03.45 23.18
13	09.41 15.40	08.26 17.07	06.59 18.25	06.18 20.48	19.03-19.31/28 22.11	03.44 23.19
14	09.39 15.42	08.23 17.10	06.55 18.28	06.15 20.51	19.03-19.31/28 22.14	03.44 23.20
15	09.37 15.45	08.20 17.13	06.52 18.31	06.11 20.54	19.03-19.30/27 22.17	03.43 23.21
16	09.36 15.47	08.17 17.16	06.49 18.33	06.08 20.57	19.03-19.29/26 22.19	03.42 23.22
17	09.34 15.50	08.14 17.18	06.46 18.36	06.05 20.59	19.04-19.28/24 22.22	03.42 23.23
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	19.05-19.27/22 22.25	03.42 23.24
19	09.30 15.55	08.08 17.24	06.39 18.41	05.59 21.05	19.06-19.26/20 22.27	03.41 23.24
20	09.28 15.58	08.05 17.27	06.36 18.44	05.56 21.08	19.07-19.24/17 22.30	03.41 23.25
21	09.26 16.00	08.02 17.30	06.33 18.47	05.52 21.10	19.10-19.22/12 22.33	03.41 23.25
22	09.23 16.03	07.59 17.33	06.29 18.49	05.49 21.13	19.15-19.16/1 22.35	03.41 23.25
23	09.21 16.06	07.56 17.36	08.42-08.43/1 18.52	06.26 21.16	05.46 21.16	03.42 23.25
24	09.19 16.09	07.53 17.38	08.37-08.48/11 18.55	06.23 21.19	05.43 21.19	03.42 23.25
25	09.17 16.12	07.50 17.41	08.36-08.50/14 18.57	06.20 21.21	05.40 21.21	03.43 23.25
26	09.14 16.14	07.46 17.44	08.35-08.51/16 19.00	06.16 21.24	05.37 21.24	03.43 23.25
27	09.12 16.17	07.43 17.47	08.33-08.51/18 19.03	06.13 21.27	05.34 21.27	03.44 23.24
28	09.09 16.20	07.40 17.50	08.32-08.52/20 19.05	06.10 21.30	05.31 21.30	03.45 23.24
29	09.07 16.23		07.07 20.08	05.27 21.32	05.27 21.32	03.46 23.23
30	09.04 16.26		07.03 20.11	05.24 21.35	05.24 21.35	03.47 23.23
31	09.02 16.29		07.00 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	0	80	133	428	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 4 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 219,0 m (TOT: 300,0 m) (692)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18 19.03-19.31/28	07.36	08.00	09.22
	23.22	22.19	20.43	19.06	16.29	15.18
2	03.49	04.58	06.21 19.03-19.30/27	07.38	08.03	09.24
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.01	06.24 19.03-19.30/27	07.41	08.06	09.27
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.52	05.03	06.26 19.03-19.29/26	07.44	08.09	09.29
	23.19	22.10	20.34	18.56	16.21	15.13
5	03.53	05.06	06.29 19.04-19.28/24	07.46	08.11	09.31
	23.17	22.07	20.30	18.53	16.18	15.12
6	03.55	05.09	06.31 19.04-19.26/22	07.49 09.12-09.21/9	08.14	09.33
	23.16	22.04	20.27	18.49	16.15	15.11
7	03.57	05.11	06.34 19.06-19.25/19	07.52 09.10-09.23/13	08.17	09.35
	23.15	22.01	20.24	18.46	16.12	15.10
8	03.58	05.14	06.37 19.07-19.22/15	07.54 09.08-09.25/17	08.20	09.37
	23.13	21.58	20.21	18.43	16.09	15.09
9	04.00	05.17	06.39 19.09-19.18/9	07.57 09.07-09.26/19	08.23	09.39
	23.12	21.55	20.17	18.40	16.07	15.08
10	04.02	05.20	06.42	08.00 09.07-09.26/19	08.26	09.41
	23.10	21.52	20.14	18.37	16.04	15.07
11	04.04	05.22	06.44	08.02 09.05-09.25/20	08.29	09.42
	23.08	21.49	20.11	18.33	16.01	15.06
12	04.06	05.25	06.47	08.05 09.05-09.25/20	08.31	09.44
	23.06	21.46	20.08	18.30	15.59	15.05
13	04.08	05.28	06.49	08.08 09.05-09.25/20	08.34	09.46
	23.05	21.43	20.04	18.27	15.56	15.05
14	04.10	05.30	06.52	08.10 09.05-09.25/20	08.37	09.47
	23.03	21.40	20.01	18.24	15.54	15.04
15	04.12	05.33	06.55	08.13 09.06-09.24/18	08.40	09.48
	23.01	21.37	19.58	18.21	15.51	15.04
16	04.15	05.36	06.57	08.16 09.07-09.23/16	08.43	09.50
	22.58	21.34	19.55	18.18	15.49	15.04
17	04.17	05.38	07.00	08.18 09.08-09.21/13	08.46	09.51
	22.56	21.31	19.51	18.14	15.46	15.04
18	04.19	05.41	07.02	08.21 09.10-09.19/9	08.48	09.52
	22.54	21.28	19.48	18.11	15.44	15.04
19	04.22	05.44	07.05	08.24	08.51	09.53
	22.52	21.25	19.45	18.08	15.42	15.04
20	04.24	05.46	07.07	08.27	08.54	09.53
	22.50	21.22	19.41	18.05	15.39	15.04
21	04.27	05.49 19.18-19.24/6	07.10	08.29	08.57	09.54
	22.47	21.19	19.38	18.02	15.37	15.04
22	04.29	05.52 19.14-19.27/13	07.13	08.32	08.59	09.55
	22.45	21.15	19.35	17.59	15.35	15.05
23	04.32	05.55 19.12-19.29/17	07.15	08.35	09.02	09.55
	22.42	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57 19.09-19.30/21	07.18	08.38	09.05	09.56
	22.40	21.09	19.28	17.53	15.31	15.06
25	04.37	06.00 19.07-19.30/23	07.20	07.40	09.07	09.56
	22.37	21.06	19.25	16.50	15.29	15.07
26	04.39	06.02 19.07-19.31/24	07.23	07.43	09.10	09.56
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05 19.05-19.31/26	07.25	07.46	09.12	09.56
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.45	06.08 19.05-19.32/27	07.28	07.49	09.15	09.56
	22.29	20.56	19.15	16.41	15.23	15.10
29	04.47	06.10 19.04-19.32/28	07.31	07.52	09.17	09.56
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13 19.04-19.32/28	07.33	07.54	09.20	09.55
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16 19.03-19.31/28		07.57		09.55
	22.21	20.47		16.32		15.13
Potential sun hours	578	495	390	311	215	167
Sum of minutes with flicker	0	241	197	213	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

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Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 12.22/3.4.388

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 5 - VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (693)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37 09.34-10.06/32	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34 09.34-10.04/30	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31 09.35-10.04/29	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27 09.36-10.02/26	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.49	07.24 09.37-10.00/23	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21 09.39-09.58/19	06.40	05.06	03.52	03.55	05.08	06.31	07.49	10.20-10.27/7	08.14
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18 09.42-09.54/12	06.37	05.03	03.51	03.56	05.11	06.34	07.52	10.16-10.32/16	08.17
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	10.13-10.34/21	08.20
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	10.12-10.36/24	08.23
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.46	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	10.09-10.37/28	08.26
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	10.08-10.38/30	08.29
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	10.07-10.38/31	08.31
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26 09.48-09.54/6	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	10.07-10.39/32	08.34
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23 09.44-09.59/15	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	10.06-10.39/33	08.37
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20 09.42-10.01/19	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	10.06-10.40/34	08.40
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17 09.39-10.02/23	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	10.05-10.40/35	08.43
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14 09.38-10.04/26	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	10.05-10.40/35	08.46
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11 09.37-10.05/28	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	10.05-10.39/34	08.48
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08 09.36-10.06/30	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	10.05-10.39/34	08.51
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05 09.35-10.06/31	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27	10.05-10.39/34	08.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02 09.34-10.07/33	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	10.05-10.38/33	08.57
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59 09.34-10.08/34	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	10.06-10.37/31	08.59
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56 09.33-10.07/34	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	10.06-10.36/30	09.02
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53 09.33-10.08/35	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	10.07-10.35/28	09.05
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49 09.33-10.08/35	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.08-09.34/26	09.07
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46 09.32-10.07/35	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10-09.32/22	09.10
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43 09.33-10.07/34	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.11-09.30/19	09.12
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.09	07.40 09.33-10.07/34	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.14-09.27/13	09.15
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.19-09.22/3	09.17
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	452	171	0	0	0	0	0	0	633	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 6 - VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 219,0 m (TOT: 300,0 m) (694)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.06	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.46
	15.40	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.04
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.49	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 7 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 8 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (713)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54 15.15	08.59 16.32	07.37 17.52	06.57 20.16	05.21 21.38	04.01 22.59	03.47 23.22	04.55 22.18	06.18 20.43	07.36 19.05	08.00 16.29	09.22 15.18
2	09.54 15.17	08.56 16.34	07.34 17.55	06.53 20.19	05.18 21.41	03.59 23.01	03.49 23.21	04.58 22.16	06.21 20.40	07.38 19.02	08.03 16.26	09.24 15.16
3	09.53 15.18	08.54 16.37	07.31 17.58	06.50 20.21	05.15 21.43	03.57 23.03	03.50 23.20	05.00 22.13	06.23 20.37	07.41 18.59	08.06 16.23	09.27 15.14
4	09.52 15.20	08.51 16.40	07.27 18.00	06.47 20.24	05.12 21.46	03.55 23.05	03.51 23.19	05.03 22.10	06.26 20.34	07.44 18.56	08.08 16.20	09.29 15.13
5	09.51 15.22	08.48 16.43	07.24 18.03	06.44 20.27	05.09 21.49	03.54 23.07	03.53 23.17	05.06 22.07	06.29 20.30	07.46 18.52	08.11 16.17	09.31 15.12
6	09.50 15.24	08.46 16.46	07.21 18.06	06.40 20.29	05.06 21.52	03.52 23.09	03.55 23.16	05.08 22.04	06.31 20.27	07.49 18.49	08.14 16.15	09.33 15.11
7	09.49 15.26	08.43 16.49	07.18 18.09	06.37 20.32	05.03 21.55	03.51 23.11	03.56 23.15	05.11 22.01	06.34 20.24	07.51 18.46	08.17 16.12	09.35 15.09
8	09.48 15.28	08.40 16.52	07.15 18.11	06.34 20.35	05.00 21.57	03.49 23.12	03.58 23.13	05.14 21.58	06.36 20.21	07.54 18.43	08.20 16.09	09.37 15.08
9	09.47 15.30	08.37 16.55	07.11 18.14	06.31 20.37	04.57 22.00	03.48 23.14	04.00 23.12	05.17 21.55	06.39 20.17	07.57 18.40	08.23 16.07	09.39 15.07
10	09.45 15.32	08.34 16.58	07.08 18.17	06.27 20.40	04.55 22.03	03.47 23.15	04.02 23.10	05.19 21.52	06.41 20.14	07.59 18.36	08.26 16.04	09.41 15.07
11	09.44 15.35	08.31 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17	04.04 23.08	05.22 21.49	06.44 20.11	08.02 18.33	08.28 16.01	09.42 15.06
12	09.42 15.37	08.29 17.04	07.02 18.22	06.21 20.46	04.49 22.08	03.45 23.18	04.06 23.06	05.25 21.46	06.47 20.07	08.05 18.30	08.31 15.59	09.44 15.05
13	09.41 15.39	08.26 17.07	06.58 18.25	06.18 20.48	04.46 22.11	03.44 23.19	04.08 23.04	05.27 21.43	06.49 20.04	08.07 18.27	08.34 15.56	09.45 15.05
14	09.39 15.42	08.23 17.10	06.55 18.28	06.14 20.51	04.43 22.14	03.43 23.20	04.10 23.02	05.30 21.40	06.52 20.01	08.10 18.24	08.37 15.53	09.47 15.04
15	09.37 15.44	08.20 17.12	06.52 18.30	06.11 20.54	04.41 22.17	03.43 23.21	04.12 23.00	05.33 21.37	06.54 19.58	08.13 18.21	08.40 15.51	09.48 15.04
16	09.35 15.47	08.17 17.15	06.49 18.33	06.08 20.56	04.38 22.19	03.42 23.22	04.14 22.58	05.35 21.34	06.57 19.54	08.15 18.17	08.43 15.48	09.49 15.03
17	09.34 15.49	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 23.23	04.17 22.56	05.38 21.31	07.00 19.51	08.18 18.14	08.45 15.46	09.51 15.03
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 23.24	04.19 22.54	05.41 21.28	07.02 19.48	08.21 18.11	08.48 15.44	09.52 15.03
19	09.30 15.55	08.08 17.24	06.39 18.41	05.58 21.05	04.30 22.27	03.41 23.24	04.21 22.52	05.44 21.25	07.05 19.45	08.24 18.08	08.51 15.41	09.53 15.03
20	09.28 15.57	08.05 17.27	06.36 18.44	05.55 21.07	04.27 22.30	03.41 23.25	04.24 22.49	05.46 21.22	07.07 19.41	08.26 18.05	08.54 15.39	09.53 15.04
21	09.25 16.00	08.02 17.30	06.32 18.47	05.52 21.10	04.25 22.33	03.41 23.25	04.26 22.47	05.49 21.18	07.10 19.38	08.29 18.02	08.56 15.37	09.54 15.04
22	09.23 16.03	07.59 17.32	06.29 18.49	05.49 21.13	04.22 22.35	03.41 23.25	04.29 22.45	05.52 21.15	07.12 19.35	08.32 17.59	08.59 15.35	09.55 15.04
23	09.21 16.06	07.56 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.41 23.25	04.31 22.42	05.54 21.12	07.15 19.31	08.35 17.56	09.02 15.32	09.55 15.05
24	09.19 16.09	07.52 17.38	06.23 18.55	05.43 21.18	04.18 22.40	03.42 23.25	04.34 22.40	05.57 21.09	07.18 19.28	08.37 17.53	09.04 15.30	09.55 15.06
25	09.16 16.11	07.49 17.41	06.19 18.57	05.40 21.21	04.15 22.43	03.42 23.25	04.36 22.37	06.00 21.06	07.20 19.25	07.40 16.50	09.07 15.28	09.56 15.06
26	09.14 16.14	07.46 17.44	06.16 19.00	05.36 21.24	04.13 22.45	03.43 23.25	04.39 22.35	06.02 21.03	07.23 19.22	07.43 16.47	09.10 15.26	09.56 15.07
27	09.12 16.17	07.43 17.47	06.13 19.03	05.33 21.27	04.11 22.48	03.43 23.24	04.42 22.32	06.05 20.59	07.25 19.18	07.46 16.44	09.12 15.24	09.56 15.08
28	09.09 16.20	07.40 17.49	06.10 19.05	05.30 21.30	04.09 22.50	03.44 23.24	04.44 22.29	06.08 20.56	07.28 19.15	07.49 16.41	09.15 15.23	09.56 15.09
29	09.07 16.23	07.37 17.52	06.07 19.08	05.27 21.32	04.07 22.52	03.45 23.23	04.47 22.27	06.10 20.53	07.30 19.12	07.51 16.38	09.17 15.21	09.56 15.10
30	09.04 16.26	07.34 17.55	06.04 19.09	05.24 21.35	04.05 22.55	03.46 23.22	04.50 22.24	06.13 20.50	07.33 19.09	07.54 16.35	09.20 15.19	09.55 15.12
31	09.02 16.29	07.31 17.58	06.01 19.10	05.21 21.36	04.02 22.56	03.44 23.21	04.47 22.25	06.15 20.46	07.37 19.12	07.57 16.32	09.23 15.18	09.55 15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 9 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (714

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 10 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (715)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 11 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (716)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 12 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (717)
Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 13 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (718)
Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 14 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (719) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 15 - NORDEX N117/2400 2400 116.8 IO! hub: 120.0 m (TOT: 178,4 m) (720)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.25	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.53	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 16 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (721)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.16	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.58	03.51	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.28
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.54	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.59	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.10	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.38
	15.31	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.48	04.02	05.20	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.37	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.06
13	09.40	08.25	06.58	06.18	04.46	03.45	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.11	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.16	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.51
	15.53	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.56	04.28	03.42	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.42	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.21	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.15	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.50	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.31	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.14
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 17 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (722)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.39	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.01	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129 **WTG:** 18 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (723)
Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 19 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (724)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.49	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129WTG: 20 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (725)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.22	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.39	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 21 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (726)
 Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 22 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (727)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 23 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (728)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.26
	15.19	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE1_Shadow__Forest_20211129**WTG:** 24 - NORDEX N131/3000 3000 131.0 IO! hub: 144.0 m (TOT: 209,5 m) (729) Sunshine probability S (Average daily sunshine hours) []

Assumptions for shadow calculations

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.56	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.31	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.26	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.30	04.57	03.48	04.00	05.16	06.39	07.57	08.22	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.39	16.06	15.07
10	09.45	08.34	07.08	06.27	04.54	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.19	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.21	05.43	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.03
20	09.27	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.57	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.22	03.41	04.29	05.51	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.08	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.39	04.15	03.42	04.36	05.59	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.21	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.46	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.07	07.28	07.48	09.14	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.08	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

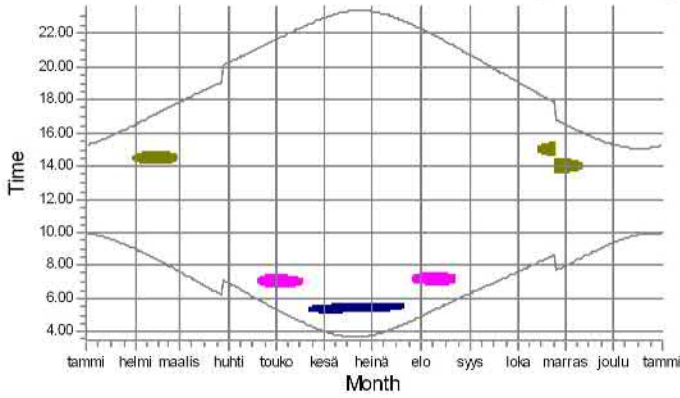
Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

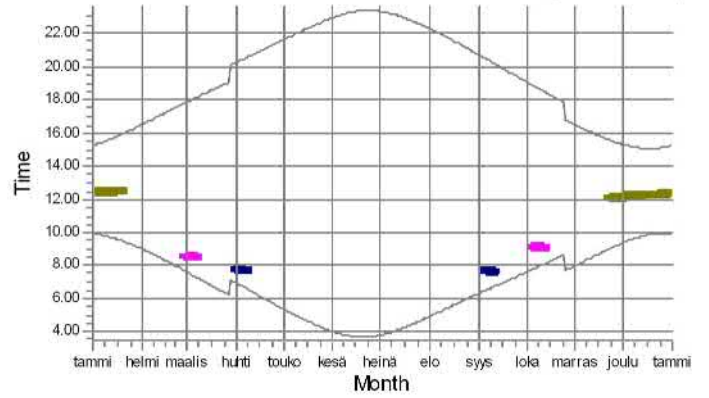
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

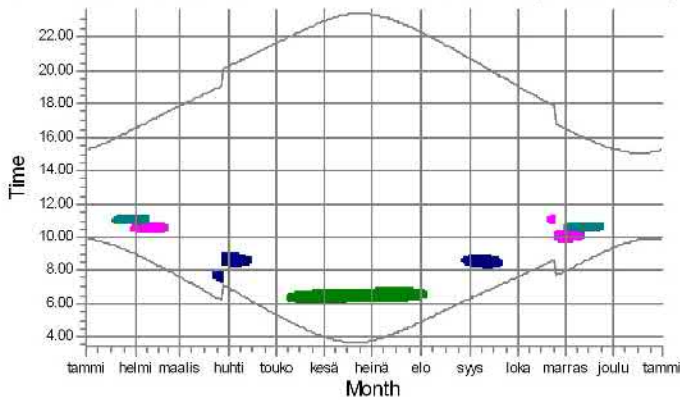
1: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



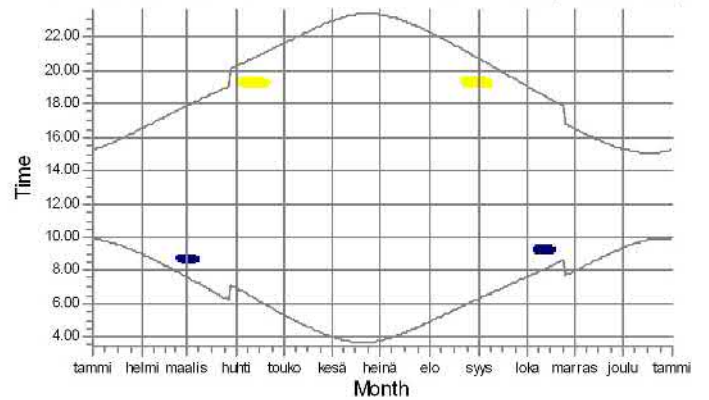
2: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



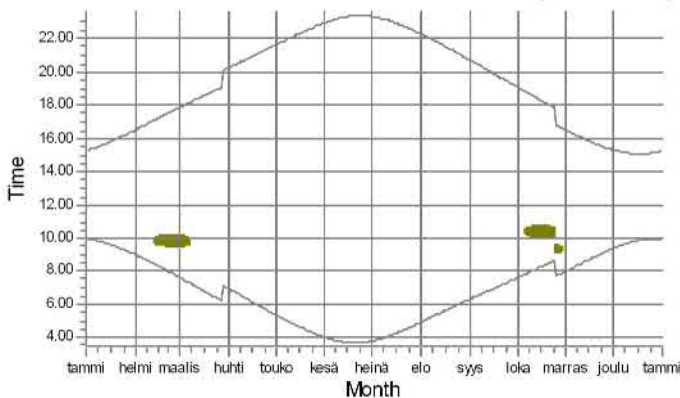
3: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



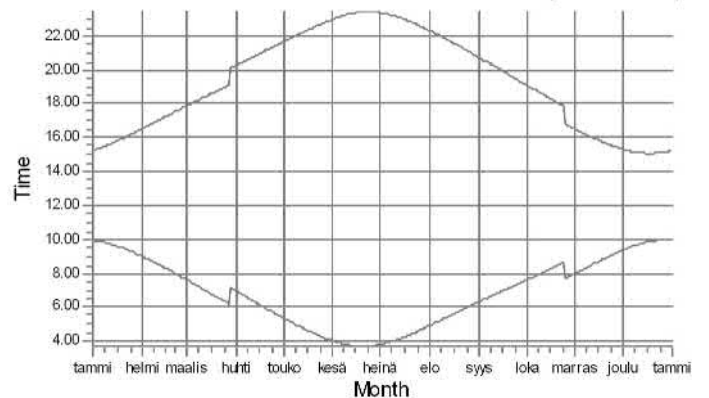
4: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



5: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



6: VESTAS V162-6.0 HH169 6000 162.0 IO| hub: 219,0 m (TOT: 300,0 m)



Shadow receptors

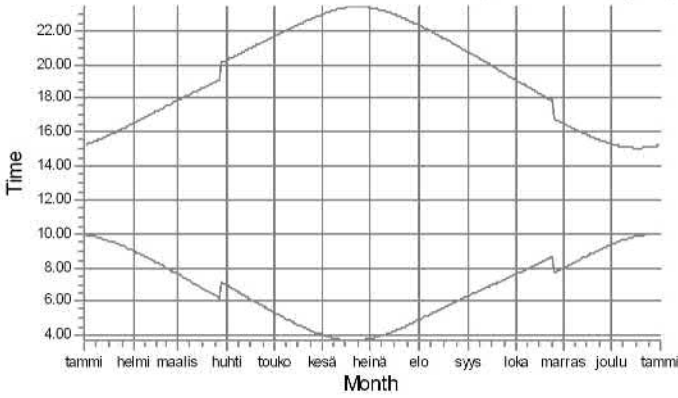
- A: Asuinrakennus A, ~Kankaanpäntie 534
- B: Asuinrakennus B, ~Ristiläntie 459
- E: Asuinrakennus E, ~Välisalontie 130

- F: Asuinrakennus F, ~Välisalontie 101
- G: Asuinrakennus G, ~Kankaanpäntie 468
- J: Asuinrakennus J, ~Penkkinevantie 85

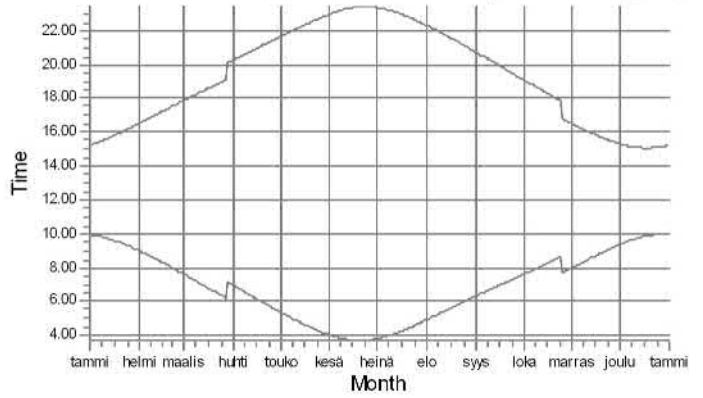
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

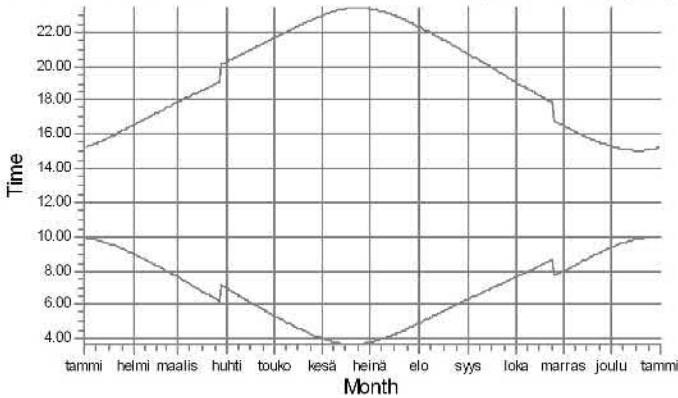
7: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (712)



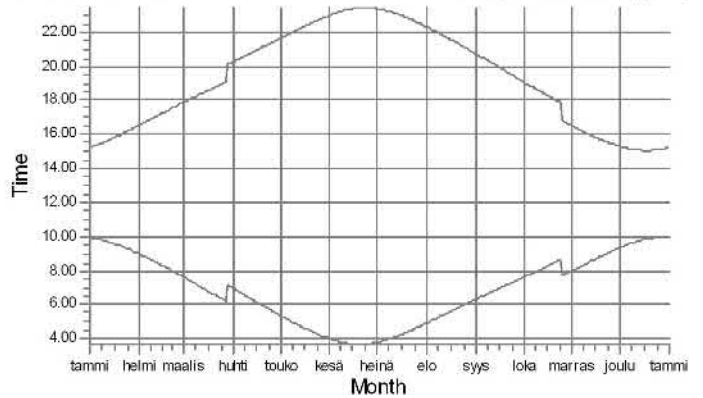
8: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (713)



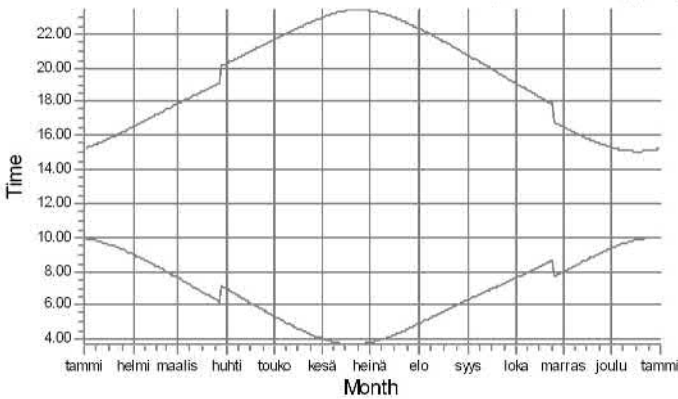
9: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (714)



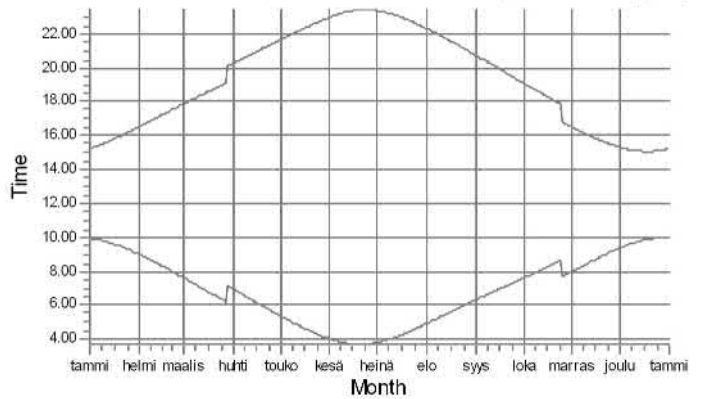
10: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (715)



11: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (716)



12: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (717)

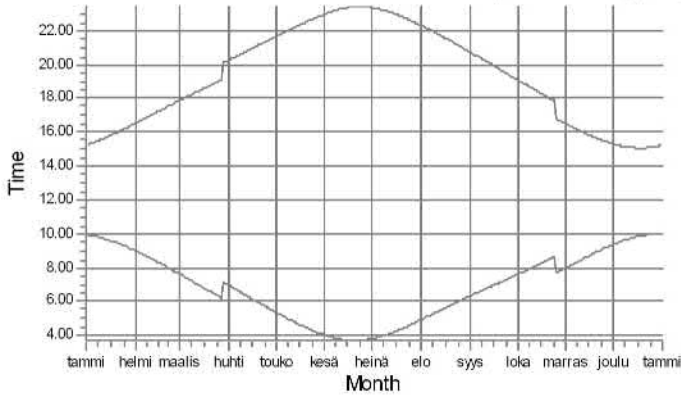


Shadow receptors

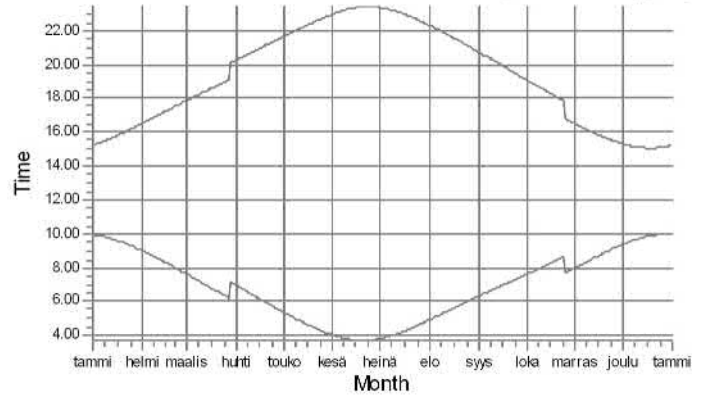
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

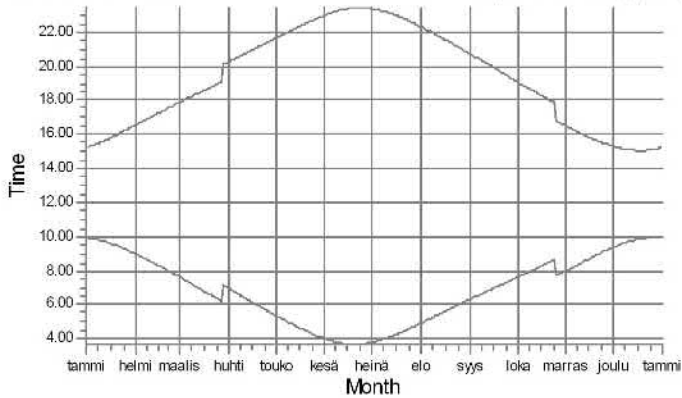
13: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (718



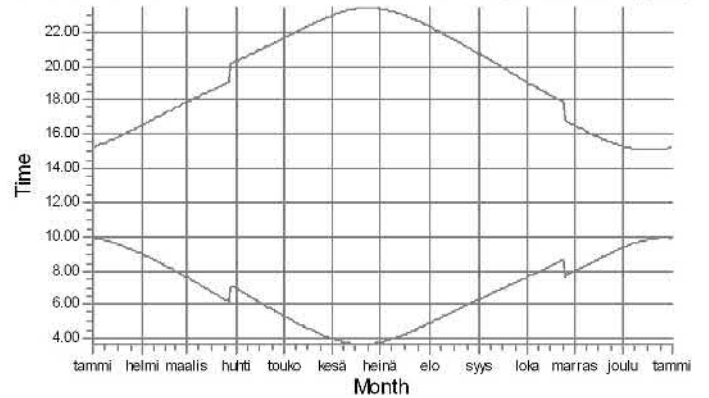
14: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (719



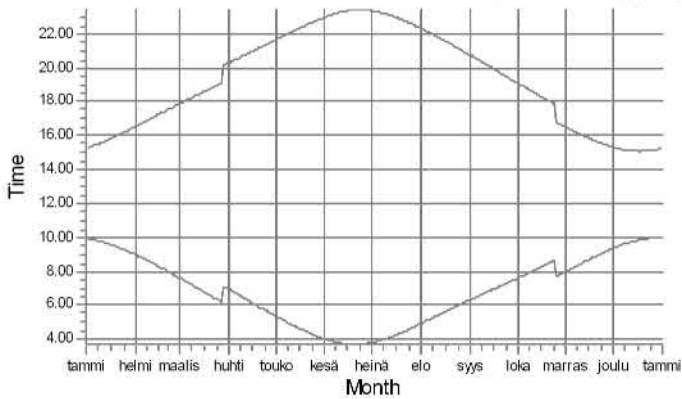
15: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (720



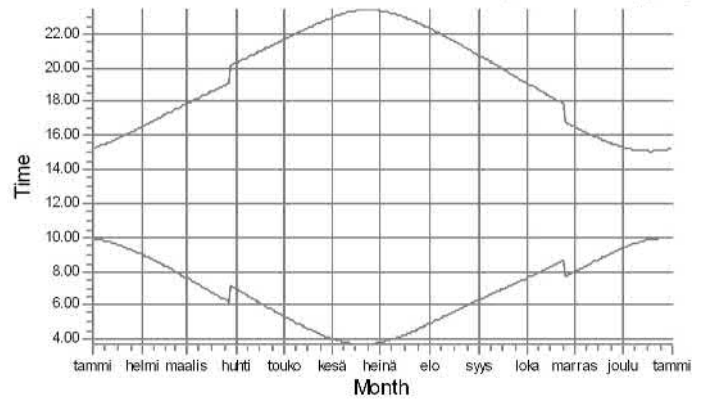
16: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (721



17: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (722



18: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (723

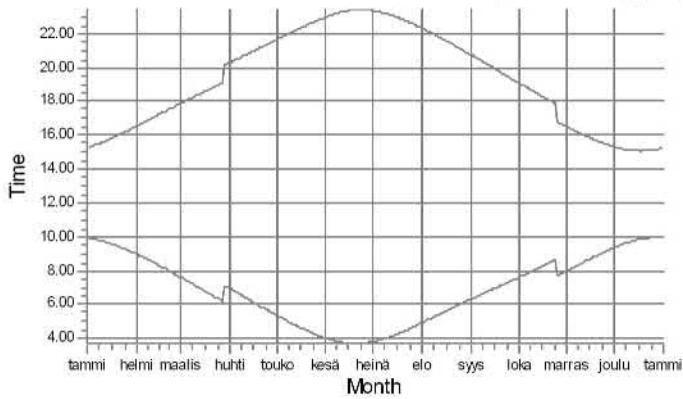


Shadow receptors

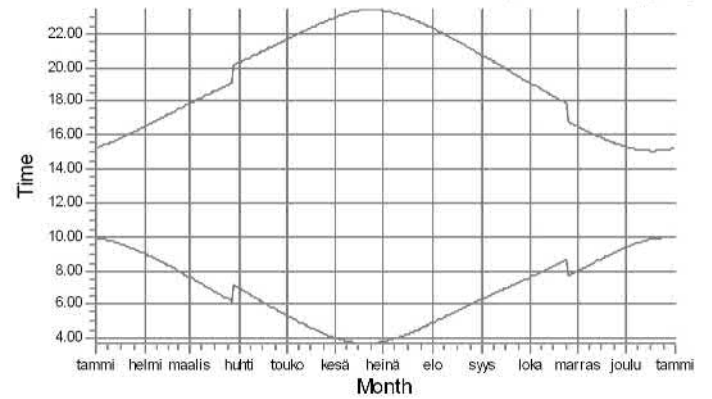
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE1_Shadow__Forest_20211129

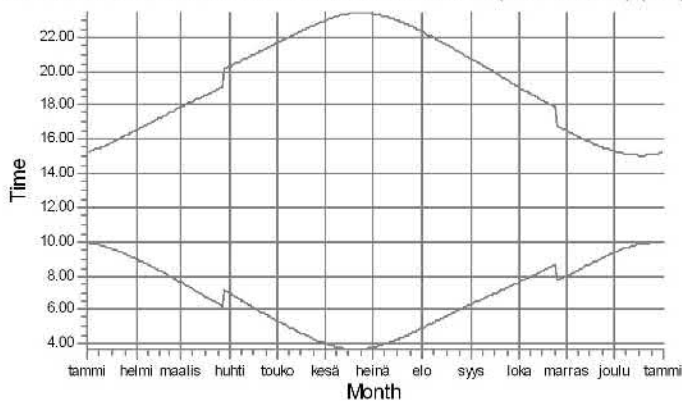
19: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (724



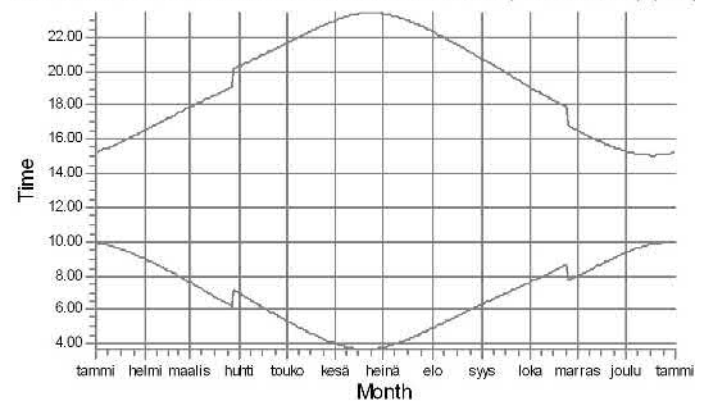
20: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (725



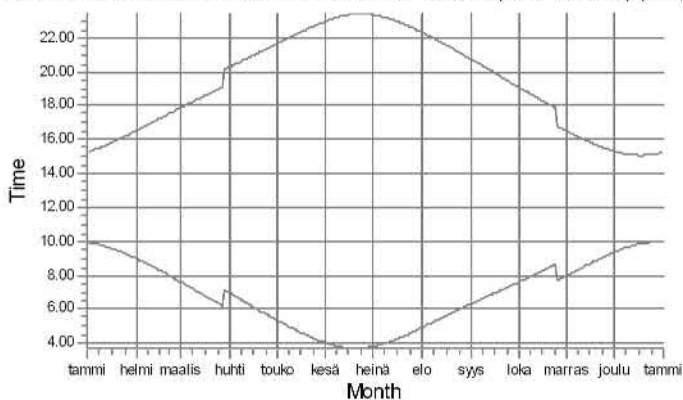
21: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (726



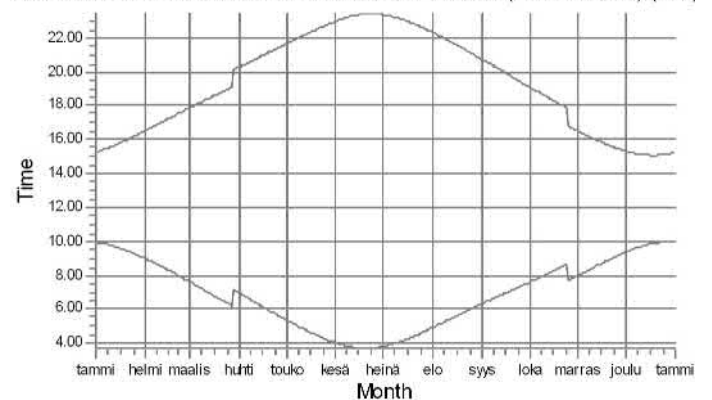
22: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (727



23: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (728



24: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (729



Shadow receptors

Project:

Paholammi /Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

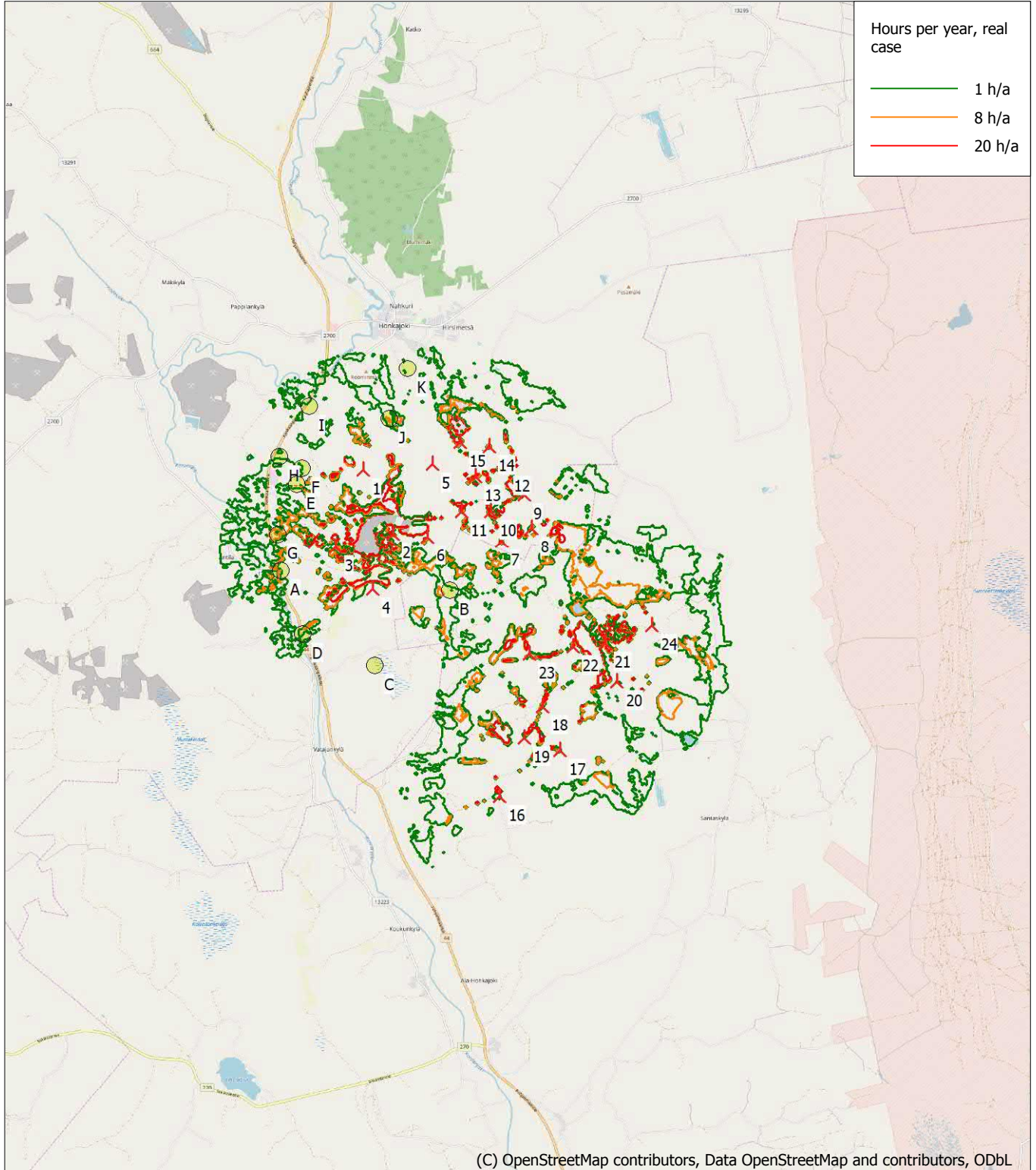
Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 12.22/3.4.388

SHADOW - Map

Calculation: Paholammi_VE1_Shadow__Forest_20211129



0 1 2 3 4 km

Map: EMD OpenStreetMap , Print scale 1:100 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 620 North: 6 877 590

New WTG

Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_EP_Tuulivoimaselvitys_0.wpo (4)

Project:

Paholammi / Neoen

Licensed user:

FCG Finnish Consulting Group Oy

Osmontie 34, PO Box 950

FI-00601 Helsinki

+358104095666

Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 12.12/3.4.388

SHADOW - Main Result

Calculation: Paholammi_VE2_Shadow_Forest_20211130

Assumptions for shadow calculations

Maximum distance for influence

Calculate only when more than 20 % of sun is covered by the blade

Please look in WTG table

Minimum sun height over horizon for influence 3 °

Day step for calculation 1 days

Time step for calculation 1 minutes

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

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: CONTOURLINE_EP_Tuulivoimaselvitys

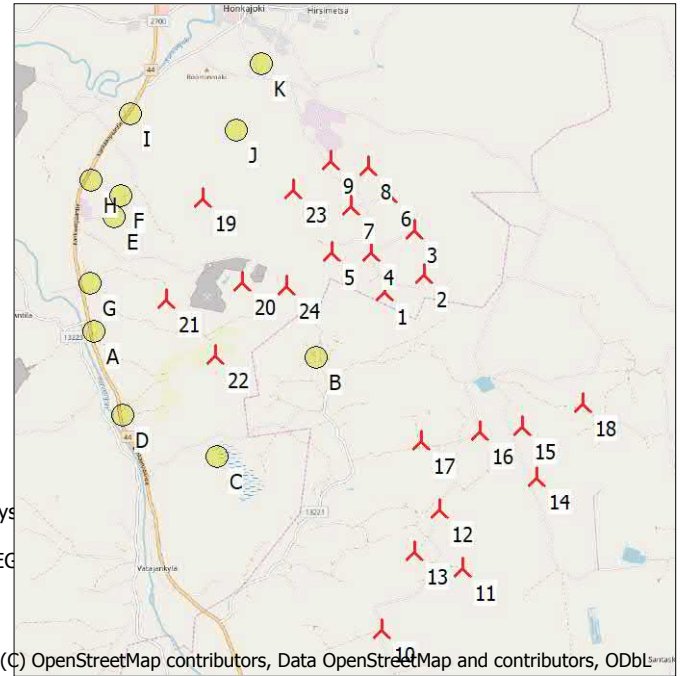
Area object(s) used in calculation:

Area object (Heights a.g.l. for e.g. Forest (ORA tool) or ZVI obstructions): REG

Obstacles used in calculation

Eye height for map: 1,5 m

Grid resolution: 1,0 m



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

All coordinates are in

Finish TM ETRS-TM35FIN-ETRS89

WTGs

No.	East	North	Z [m]	Row data/Description	WTG type			Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Shadow data	
					Valid	Manufact.	Type-generator				Calculation distance [m]	RPM [RPM]
1	253 616	6 878 546	105,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
2	254 154	6 878 757	112,2	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
3	254 073	6 879 329	112,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
4	253 487	6 879 084	110,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
5	252 957	6 879 121	107,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
6	253 775	6 879 840	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
7	253 252	6 879 721	117,5	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
8	253 525	6 880 225	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
9	253 026	6 880 328	115,0	NORDEX N117/2400 2400 ...	Yes	NORDEX	N117/2400-2 400	2 400	116,8	120,0	1 487	11,8
10	253 256	6 874 086	105,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
11	254 378	6 874 820	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
12	254 139	6 875 605	109,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
13	253 765	6 875 082	105,6	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
14	255 464	6 875 947	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
15	255 305	6 876 650	112,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
16	254 745	6 876 621	107,5	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
17	253 975	6 876 541	107,4	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
18	256 142	6 876 896	110,0	NORDEX N131/3000 3000 ...	Yes	NORDEX	N131/3000-3 000	3 000	131,0	144,0	1 721	10,3
19	251 304	6 879 975	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
20	251 747	6 878 810	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
21	250 727	6 878 659	100,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
22	251 315	6 877 881	105,0	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
23	252 523	6 879 987	107,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4
24	252 334	6 878 721	102,5	VESTAS V162-6.0 HH169 6...	Yes	VESTAS	V162-6.0 HH169-6 000	6 000	162,0	169,0	2 041	10,4

Shadow receptor-Input

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]	[m]	
A	Asuinrakennus A, ~Kankaanpääntie 534	249 740	6 878 307	92,4	5,0	5,0	1,0	90,0	"Green house mode"	6,0
B	Asuinrakennus B, ~Ristiläntie 459	252 656	6 877 758	100,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

To be continued on next page...

SHADOW - Main Result

Calculation: Paholammi_VE2_Shadow_Forest_20211130

...continued from previous page

No.	Name	East	North	Z	Width	Height	Elevation a.g.l.	Slope of window	Direction mode	Eye height (ZVI) a.g.l.
				[m]	[m]	[m]	[m]	[°]		[m]
C	Lomarakennus C, ~Variksentie 93	251 251	6 876 536	93,2	5,0	5,0	1,0	90,0	"Green house mode"	6,0
D	Asuinrakennus D, ~Kankaanpääntie 646	250 034	6 877 181	87,7	5,0	5,0	1,0	90,0	"Green house mode"	6,0
E	Asuinrakennus E, ~Välisälontie 130	250 125	6 879 799	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
F	Asuinrakennus F, ~Välisälontie 101	250 226	6 880 083	97,6	5,0	5,0	1,0	90,0	"Green house mode"	6,0
G	Asuinrakennus G, ~Kankaanpääntie 468	249 740	6 878 942	94,8	5,0	5,0	1,0	90,0	"Green house mode"	6,0
H	Lomarakennus H, ~Kankaanpääntie 320	249 856	6 880 304	95,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0
I	Asuinrakennus I, ~Kankaanpääntie 218	250 438	6 881 151	96,3	5,0	5,0	1,0	90,0	"Green house mode"	6,0
J	Asuinrakennus J, ~Penkkinevantie 85	251 819	6 880 838	102,5	5,0	5,0	1,0	90,0	"Green house mode"	6,0
K	Asuinrakennus K, ~Seppäkoskentie 36	252 204	6 881 690	105,0	5,0	5,0	1,0	90,0	"Green house mode"	6,0

Calculation Results

Shadow receptor

No.	Name	Shadow, expected values	
		Shadow hours	per year [h/year]
A	Asuinrakennus A, ~Kankaanpääntie 534		0:00
B	Asuinrakennus B, ~Ristiläntie 459		5:26
C	Lomarakennus C, ~Variksentie 93		0:00
D	Asuinrakennus D, ~Kankaanpääntie 646		0:00
E	Asuinrakennus E, ~Välisälontie 130		8:53
F	Asuinrakennus F, ~Välisälontie 101		1:57
G	Asuinrakennus G, ~Kankaanpääntie 468		12:49
H	Lomarakennus H, ~Kankaanpääntie 320		0:00
I	Asuinrakennus I, ~Kankaanpääntie 218		0:00
J	Asuinrakennus J, ~Penkkinevantie 85		9:03
K	Asuinrakennus K, ~Seppäkoskentie 36		0:00

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

No.	Name	Worst case [h/year]	Expected [h/year]
1	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (712)	0:00	0:00
2	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (713)	0:00	0:00
3	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (714)	0:00	0:00
4	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (715)	0:00	0:00
5	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (716)	0:00	0:00
6	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (717)	0:00	0:00
7	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (718)	0:00	0:00
8	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (719)	0:00	0:00
9	NORDEX N117/2400 2400 116.8 !O! hub: 120,0 m (TOT: 178,4 m) (720)	0:00	0:00
10	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (721)	0:00	0:00
11	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (722)	0:00	0:00
12	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (723)	0:00	0:00
13	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (724)	0:00	0:00
14	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (725)	0:00	0:00
15	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (726)	0:00	0:00
16	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (727)	0:00	0:00
17	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (728)	0:00	0:00
18	NORDEX N131/3000 3000 131.0 !O! hub: 144,0 m (TOT: 209,5 m) (729)	0:00	0:00
19	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (730)	76:02	15:15
20	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731)	37:41	5:56
21	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)	63:35	9:05
22	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)	21:16	4:14
23	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (734)	22:46	3:30
24	VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (735)	0:00	0:00

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.

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** A - Asuinrakennus A, ~Kankaanpääntie 534
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.24	15.15
4	09.52	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.07	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.59	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.15	20.38	22.00	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.50	20.11	18.34	16.02	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.11	23.19	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.22	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.19	08.46	09.51
	15.50	17.19	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.41	09.07	09.56
	16.12	17.41	18.58	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.47	06.17	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.25	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** B - Asuinrakennus B, ~Ristiläntie 459

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.54	08.59	07.37	06.57	19.14 (22)	04.01
	15.15	16.32	17.52	20.16	21	19.35 (22)
2	09.54	08.56	07.34	06.53	19.13 (22)	05.18
	15.17	16.35	17.55	20.19	23	19.36 (22)
3	09.53	08.54	07.31	06.50	19.12 (22)	05.15
	15.19	16.38	17.58	20.21	25	19.37 (22)
4	09.52	08.51	07.27	06.47	19.11 (22)	05.12
	15.20	16.40	18.01	20.24	27	19.38 (22)
5	09.51	08.48	07.24	06.44	19.09 (22)	05.09
	15.22	16.43	18.03	20.27	28	19.37 (22)
6	09.50	08.46	07.21	06.40	19.09 (22)	05.06
	15.24	16.46	18.06	20.29	28	19.37 (22)
7	09.49	08.43	07.18	06.37	19.09 (22)	05.03
	15.26	16.49	18.09	20.32	28	19.37 (22)
8	09.48	08.40	07.15	06.34	19.09 (22)	05.00
	15.28	16.52	18.12	20.35	28	19.37 (22)
9	09.47	08.37	07.11	06.31	19.09 (22)	04.58
	15.30	16.55	18.14	20.38	28	19.37 (22)
10	09.45	08.34	07.08	06.27	19.09 (22)	04.55
	15.33	16.58	18.17	20.40	27	19.36 (22)
11	09.44	08.32	07.05	06.24	19.09 (22)	04.52
	15.35	17.01	18.20	20.43	26	19.35 (22)
12	09.42	08.29	07.02	06.21	19.09 (22)	04.49
	15.37	17.04	18.22	20.46	24	19.33 (22)
13	09.41	08.26	06.59	06.18	19.10 (22)	04.46
	15.40	17.07	18.25	20.48	22	19.32 (22)
14	09.39	08.23	06.55	06.15	19.11 (22)	04.44
	15.42	17.10	18.28	20.51	20	19.31 (22)
15	09.37	08.20	06.52	06.11	19.13 (22)	04.41
	15.45	17.13	18.31	20.54	16	19.29 (22)
16	09.35	08.17	06.49	06.08	19.15 (22)	04.38
	15.47	17.15	18.33	20.57	11	19.26 (22)
17	09.34	08.14	06.46	06.05		04.35
	15.50	17.18	18.36	20.59		22.22
18	09.32	08.11	06.42	06.02		04.33
	15.52	17.21	18.39	21.02		22.25
19	09.30	08.08	06.39	05.59		04.30
	15.55	17.24	18.41	21.05		22.27
20	09.28	08.05	06.36	05.55		04.28
	15.58	17.27	18.44	21.07		22.30
21	09.25	08.02	06.33	05.52		04.25
	16.00	17.30	18.47	21.10		22.33
22	09.23	07.59	06.29	05.49		04.23
	16.03	17.33	18.49	21.13		22.35
23	09.21	07.56	06.26	05.46		04.20
	16.06	17.35	18.52	21.16		22.38
24	09.19	07.53	06.23	05.43		04.18
	16.09	17.38	18.55	21.18		22.40
25	09.16	07.49	06.20	05.40		04.16
	16.12	17.41	18.57	21.21		22.43
26	09.14	07.46	06.16	05.37		04.13
	16.14	17.44	19.00	21.24		22.45
27	09.12	07.43	06.13	05.34		04.11
	16.17	17.47	19.03	21.27		22.48
28	09.09	07.40	06.10	05.30		04.09
	16.20	17.49	19.05	21.30		22.50
29	09.07		07.07	19.23 (22)	05.27	04.07
	16.23		20.08	5 19.28 (22)	21.32	22.52
30	09.04		07.03	19.19 (22)	05.24	04.05
	16.26		20.11	13 19.32 (22)	21.35	22.55
31	09.02		07.00	19.17 (22)		04.03
	16.29		20.13	18 19.35 (22)		22.57
Potential sun hours	194	247	364	443	547	586
Total, worst case			36			458
Sun reduction			0,36			0,47
Oper. time red.			0,88			0,88
Wind dir. red.			0,61			0,63
Total reduction			0,19			0,26
Total, real			7			118

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** B - Asuinrakennus B, ~Ristolantie 459

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December		
1	03.48	21.59 (20)	04.55	06.18	19.08 (22)	07.36	08.00	09.22
	23.22	18 22.17 (20)	22.18	20.43	26 19.34 (22)	19.05	16.29	15.18
2	03.49	22.00 (20)	04.58	06.21	19.07 (22)	07.38	08.03	09.24
	23.21	16 22.16 (20)	22.16	20.40	27 19.34 (22)	19.02	16.26	15.16
3	03.50	22.02 (20)	05.00	06.23	19.07 (22)	07.41	08.06	09.27
	23.20	15 22.17 (20)	22.13	20.37	28 19.35 (22)	18.59	16.23	15.15
4	03.52	22.02 (20)	05.03	06.26	19.06 (22)	07.44	08.09	09.29
	23.19	14 22.16 (20)	22.10	20.34	28 19.34 (22)	18.56	16.20	15.13
5	03.53	22.03 (20)	05.06	06.29	19.06 (22)	07.46	08.11	09.31
	23.17	12 22.15 (20)	22.07	20.30	28 19.34 (22)	18.53	16.18	15.12
6	03.55	22.04 (20)	05.09	06.31	19.05 (22)	07.49	08.14	09.33
	23.16	10 22.14 (20)	22.04	20.27	28 19.33 (22)	18.49	16.15	15.11
7	03.56	22.06 (20)	05.11	06.34	19.05 (22)	07.52	08.17	09.35
	23.15	7 22.13 (20)	22.01	20.24	28 19.33 (22)	18.46	16.12	15.10
8	03.58	05.14	06.36	19.05 (22)	07.54	08.20	09.37	
	23.13	21.58	20.21	27 19.32 (22)	18.43	16.09	15.09	
9	04.00	05.17	06.39	19.05 (22)	07.57	08.23	09.39	
	23.12	21.55	20.17	26 19.31 (22)	18.40	16.07	15.08	
10	04.02	05.19	06.42	19.06 (22)	07.59	08.26	09.41	
	23.10	21.52	20.14	24 19.30 (22)	18.37	16.04	15.07	
11	04.04	05.22	06.44	19.06 (22)	08.02	08.28	09.42	
	23.08	21.49	20.11	22 19.28 (22)	18.33	16.01	15.06	
12	04.06	05.25	06.47	19.08 (22)	08.05	08.31	09.44	
	23.06	21.46	20.08	18 19.26 (22)	18.30	15.59	15.05	
13	04.08	05.28	06.49	19.09 (22)	08.07	08.34	09.45	
	23.04	21.43	20.04	14 19.23 (22)	18.27	15.56	15.05	
14	04.10	05.30	06.52	19.13 (22)	08.10	08.37	09.47	
	23.02	21.40	20.01	7 19.20 (22)	18.24	15.54	15.04	
15	04.12	05.33	06.54	08.13	08.40	09.48		
	23.00	21.37	19.58	18.21	15.51	15.04		
16	04.15	05.36	06.57	08.16	08.43	09.49		
	22.58	21.34	19.54	18.18	15.49	15.04		
17	04.17	05.38	07.00	08.18	08.45	09.51		
	22.56	21.31	19.51	18.14	15.46	15.04		
18	04.19	05.41	07.02	08.21	08.48	09.52		
	22.54	21.28	19.48	18.11	15.44	15.04		
19	04.22	05.44	07.05	08.24	08.51	09.52		
	22.52	21.25	19.45	18.08	15.42	15.04		
20	04.24	05.46	07.07	08.26	08.54	09.53		
	22.49	21.22	19.41	18.05	15.39	15.04		
21	04.27	05.49	07.10	08.29	08.56	09.54		
	22.47	21.18	19.38	18.02	15.37	15.04		
22	04.29	05.52	07.12	08.32	08.59	09.55		
	22.45	21.15	19.35	17.59	15.35	15.05		
23	04.32	05.54	07.15	08.35	09.02	09.55		
	22.42	21.12	19.32	17.56	15.33	15.05		
24	04.34	05.57	07.18	08.38	09.05	09.55		
	22.40	21.09	19.28	17.53	15.31	15.06		
25	04.37	06.00	07.20	08.40	09.07	09.56		
	22.37	21.06	19.25	16.50	15.29	15.07		
26	04.39	06.02	07.23	08.43	09.10	09.56		
	22.35	21.03	19.22	16.47	15.27	15.07		
27	04.42	06.05	19.17 (22)	07.25	08.45	09.12	09.56	
	22.32	20.59	11 19.28 (22)	19.18	16.44	15.25	15.08	
28	04.44	06.08	19.14 (22)	07.28	08.48	09.15	09.56	
	22.29	20.56	17 19.31 (22)	19.15	16.41	15.23	15.09	
29	04.47	06.10	19.12 (22)	07.31	08.51	09.17	09.56	
	22.27	20.53	20 19.32 (22)	19.12	16.38	15.21	15.11	
30	04.50	06.13	19.11 (22)	07.33	08.54	09.20	09.55	
	22.24	20.50	22 19.33 (22)	19.09	16.35	15.19	15.12	
31	04.52	06.16	19.09 (22)	07.36	08.57	09.23	09.55	
	22.21	20.47	24 19.33 (22)	16.32	15.17	15.13		
Potential sun hours	578	495	390	311	215	167		
Total, worst case	92	94	331					
Sun reduction	0,48	0,43	0,36					
Oper. time red.	0,88	0,88	0,88					
Wind dir. red.	0,63	0,61	0,61					
Total reduction	0,26	0,23	0,19					
Total, real	24	22	64					

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: Paholammi_VE2_Shadow_Forest_20211130**Shadow receptor:** C - Lomarakennus C, ~Variksentie 93
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.06	16.29	15.18
2	09.54	08.56	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.34	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.10	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.14	20.38	22.00	23.14	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.08	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.49
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.24	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.55
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** D - Asuinrakennus D, ~Kankaanpääntie 646
Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.22	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.58	03.51	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	16.24	15.15
4	09.52	08.51	07.28	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.09	09.29
	15.21	16.41	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.21	15.14
5	09.51	08.49	07.24	06.44	05.10	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.44	18.04	20.27	21.49	23.07	23.17	22.07	20.31	18.53	16.18	15.12
6	09.50	08.46	07.21	06.41	05.07	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.47	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.50	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.12	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.10	15.09
9	09.47	08.37	07.12	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.31	16.55	18.15	20.38	22.00	23.14	23.12	21.55	20.18	18.40	16.07	15.08
10	09.45	08.35	07.08	06.28	04.55	03.47	04.02	05.20	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.34	16.02	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.06
13	09.41	08.26	06.59	06.18	04.47	03.44	04.08	05.28	06.50	08.08	08.34	09.46
	15.40	17.07	18.25	20.49	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.12	04.41	03.43	04.13	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.19	23.22	22.58	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.36	03.42	04.17	05.39	07.00	08.18	08.46	09.51
	15.50	17.19	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.52
	15.53	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	09.54
	16.01	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.30	05.49	04.23	03.42	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.50	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.21	03.42	04.32	05.55	07.15	08.35	09.02	09.55
	16.06	17.36	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.58	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.15	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.08
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	21.00	19.19	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.10
29	09.07		07.07	05.28	04.07	03.46	04.47	06.11	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.25	04.05	03.47	04.50	06.13	07.33	07.55	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.20	15.12
31	09.02		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.14		22.57		22.21	20.47		16.32		15.14
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** E - Asuinrakennus E, ~Välisalontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 16.32 30	10.16 (21) 10.46 (21)	07.37 17.52 21	08.20 (20) 08.41 (20)	06.57 20.16
2	09.54 15.17	08.57 16.35 31	10.16 (21) 10.47 (21)	07.34 17.55 20	08.20 (20) 08.40 (20)	06.54 20.19
3	09.53 15.19	08.54 16.38 31	10.15 (21) 10.46 (21)	07.31 17.58 19	08.20 (20) 08.39 (20)	06.50 20.22
4	09.53 15.20	08.51 16.41 31	10.16 (21) 10.47 (21)	07.28 18.01 18	08.21 (20) 08.39 (20)	06.47 20.24
5	09.52 15.22	08.49 16.44 31	10.16 (21) 10.47 (21)	07.24 18.04 16	08.21 (20) 08.37 (20)	06.44 20.27
6	09.51 15.24	08.46 16.46 30	10.17 (21) 10.47 (21)	07.21 18.06 14	08.22 (20) 08.36 (20)	06.41 20.30
7	09.50 15.26	08.43 16.49 30	10.17 (21) 10.47 (21)	07.18 18.09 8	08.25 (20) 08.33 (20)	06.37 20.32
8	09.48 15.28	08.40 16.52 29	10.17 (21) 10.46 (21)	07.15 18.12	06.34 20.35	20.33
9	09.47 15.30	08.38 16.55 28	10.18 (21) 10.46 (21)	07.12 18.15	06.31 20.38	20.34
10	09.46 15.33	08.35 16.58 26	10.19 (21) 10.45 (21)	07.08 18.17	06.28 20.40	20.35
11	09.44 15.35	08.32 17.01 25	10.20 (21) 10.45 (21)	07.05 18.20	06.24 20.43	20.36
12	09.43 15.37	08.29 17.04 23	10.21 (21) 10.44 (21)	07.02 18.23	06.21 20.46	20.37
13	09.41 15.40	08.26 17.07 19	10.22 (21) 10.41 (21)	06.59 18.25	06.18 20.49	20.38
14	09.39 15.42	08.23 17.10 15	10.24 (21) 10.39 (21)	06.56 18.28	06.15 20.51	20.39
15	09.38 15.45	08.20 17.13 8	10.28 (21) 10.36 (21)	06.52 18.31	06.12 20.54	20.40
16	09.36 15.47	08.17 17.16	06.49 18.33	06.08 20.57	12 07.08 (19) 06.53 (19)	22.17 04.38
17	09.34 15.50	08.14 17.18	06.46 18.36	06.05 21.00	17 07.10 (19) 06.50 (19)	22.20 04.35
18	09.32 15.52	08.11 17.21	06.43 18.39	06.02 21.02	22 07.12 (19) 06.49 (19)	22.22 04.33
19	09.30 15.55	08.08 17.24	06.39 18.42	05.59 21.05	24 07.13 (19) 06.47 (19)	22.25 04.30
20	09.28 15.58	08.05 17.27	06.36 18.44	05.56 21.08	27 07.14 (19) 06.46 (19)	22.28 04.28
21	09.26 16.00	08.02 17.30	06.33 18.47	05.52 21.10	29 07.15 (19) 06.45 (19)	22.30 04.25
22	09.24 16.03	10.23 (21) 07.59 10.34 (21) 17.33	06.30 18.50	05.49 21.13	30 07.15 (19) 06.44 (19)	22.33 04.23
23	09.21 16.06	10.21 (21) 10.36 (21) 17.36	06.26 08.28 (20) 18.52	05.46 21.16	31 07.15 (19) 06.44 (19)	22.36 04.20
24	09.19 16.09	15 10.36 (21) 10.20 (21) 17.36 07.53	7 08.35 (20) 18.52	05.43 21.19	32 07.16 (19) 06.43 (19)	22.38 04.18
25	09.17 16.12	18 10.38 (21) 10.19 (21) 17.38 07.50	13 08.38 (20) 18.55	05.40 21.22	33 07.16 (19) 06.44 (19)	22.41 04.16
26	09.14 16.14	21 10.40 (21) 10.18 (21) 17.41 07.47	16 08.39 (20) 18.58	05.37 21.24	32 07.16 (19) 06.43 (19)	22.43 04.13
27	09.12 16.17	23 10.41 (21) 10.17 (21) 17.44 07.43	18 08.40 (20) 19.00	05.34 21.27	33 07.16 (19) 06.43 (19)	22.46 04.11
28	09.10 16.20	25 10.42 (21) 10.17 (21) 17.47 07.40	20 08.40 (20) 19.03	05.31 21.30	33 07.16 (19) 06.43 (19)	22.48 04.09
29	09.07 16.23	26 10.43 (21) 10.16 (21) 17.50	20 08.40 (20) 19.06	05.27 21.33	32 07.15 (19) 06.43 (19)	22.50 04.07
30	09.05 16.26	28 10.44 (21) 10.16 (21) 17.53	20.08 07.03	05.24 21.35	32 07.15 (19) 06.43 (19)	22.53 04.05
31	09.02 16.29	29 10.45 (21) 10.16 (21) 17.56	20.11 07.00	05.21 21.35	31 07.14 (19) 06.43 (19)	22.55 04.03
Potential sun hours	194	247	364	443	547	586
Total, worst case	225	481	116	450	192	
Sun reduction	0,16	0,32	0,36	0,45	0,50	
Oper. time red.	0,88	0,88	0,88	0,88	0,88	
Wind dir. red.	0,66	0,65	0,62	0,59	0,59	
Total reduction	0,09	0,19	0,20	0,24	0,26	
Total, real	21	90	23	107	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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** E - Asuinrakennus E, ~Välisälontie 130
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18	07.36	08.00	09.48 (21) 09.22
	23.22	22.19	20.44	19.06	16.29	27 10.15 (21) 15.18
2	03.49	04.58	06.21	07.39	08.03	09.47 (21) 09.25
	23.21	22.16	20.40	19.02	16.26	28 10.15 (21) 15.16
3	03.50	05.01	06.24	07.41	08.06	09.47 (21) 09.27
	23.20	22.13	20.37	18.59	16.23	29 10.16 (21) 15.15
4	03.52	05.03	07.03 (19) 06.26	07.44	08.09	09.47 (21) 09.29
	23.19	22.10	9 07.12 (19) 20.34	18.56	16.21	30 10.17 (21) 15.13
5	03.53	05.06	07.00 (19) 06.29	07.46	08.12	09.46 (21) 09.31
	23.18	22.07	15 07.15 (19) 20.31	18.53	16.18	31 10.17 (21) 15.12
6	03.55	05.09	06.58 (19) 06.31	07.49	2 09.03 (20) 08.15	09.46 (21) 09.33
	23.16	22.04	18 07.16 (19) 20.27	18.50	30 09.05 (20) 16.15	10.16 (21) 15.11
7	03.56	05.11	06.57 (19) 06.34	07.52	08.59 (20) 08.17	09.46 (21) 09.35
	23.15	22.02	21 07.18 (19) 20.24	18.46	11 09.10 (20) 16.12	31 10.17 (21) 15.10
8	03.58	05.14	06.55 (19) 06.37	07.54	08.57 (20) 08.20	09.46 (21) 09.37
	23.14	21.59	24 07.19 (19) 20.21	18.43	15 09.12 (20) 16.09	31 10.17 (21) 15.09
9	04.00	05.17	06.55 (19) 06.39	07.57	08.56 (20) 08.23	09.47 (21) 09.39
	23.12	21.56	26 07.21 (19) 20.18	18.40	17 09.13 (20) 16.07	30 10.17 (21) 15.08
10	04.02	05.19	06.53 (19) 06.42	08.00	08.55 (20) 08.26	09.47 (21) 09.41
	23.10	21.53	28 07.21 (19) 20.14	18.37	19 09.14 (20) 16.04	30 10.17 (21) 15.07
11	04.04	05.22	06.52 (19) 06.44	08.02	08.53 (20) 08.29	09.47 (21) 09.43
	23.09	21.50	29 07.21 (19) 20.11	18.33	20 09.13 (20) 16.01	29 10.16 (21) 15.06
12	04.06	05.25	06.52 (19) 06.47	08.05	08.53 (20) 08.32	09.48 (21) 09.44
	23.07	21.47	30 07.22 (19) 20.08	18.30	20 09.13 (20) 15.59	29 10.17 (21) 15.05
13	04.08	05.28	06.51 (19) 06.50	08.08	08.53 (20) 08.34	09.48 (21) 09.46
	23.05	21.44	31 07.22 (19) 20.04	18.27	20 09.13 (20) 15.56	28 10.16 (21) 15.05
14	04.10	05.30	06.51 (19) 06.52	08.10	08.53 (20) 08.37	09.50 (21) 09.47
	23.03	21.41	32 07.23 (19) 20.01	18.24	20 09.13 (20) 15.54	26 10.16 (21) 15.04
15	04.12	05.33	06.50 (19) 06.55	08.13	08.53 (20) 08.40	09.50 (21) 09.49
	23.01	21.37	33 07.23 (19) 19.58	18.21	19 09.12 (20) 15.51	25 10.15 (21) 15.04
16	04.15	05.36	06.50 (19) 06.57	08.16	08.54 (20) 08.43	09.51 (21) 09.50
	22.59	21.34	33 07.23 (19) 19.55	18.18	18 09.12 (20) 15.49	23 10.14 (21) 15.04
17	04.17	05.38	06.50 (19) 07.00	08.19	08.55 (20) 08.46	09.53 (21) 09.51
	22.57	21.31	33 07.23 (19) 19.51	18.15	15 09.10 (20) 15.46	20 10.13 (21) 15.04
18	04.19	05.41	06.49 (19) 07.02	08.21	08.58 (20) 08.49	09.54 (21) 09.52
	22.54	21.28	33 07.22 (19) 19.48	18.11	11 09.09 (20) 15.44	18 10.12 (21) 15.04
19	04.22	05.44	06.50 (19) 07.05	08.24	09.01 (20) 08.51	09.56 (21) 09.53
	22.52	21.25	32 07.22 (19) 19.45	18.08	5 09.06 (20) 15.42	15 10.11 (21) 15.04
20	04.24	05.47	06.49 (19) 07.08	08.27	08.54 (20) 08.54	09.58 (21) 09.54
	22.50	21.22	32 07.21 (19) 19.42	18.05	11 15.39	10.09 (21) 15.04
21	04.27	05.49	06.50 (19) 07.10	08.29	08.57 (20) 08.57	09.54 (21) 09.54
	22.47	21.19	31 07.21 (19) 19.38	18.02	1 15.37	10.05 (21) 15.04
22	04.29	05.52	06.50 (19) 07.13	08.32	09.00 (20) 09.00	09.55 (21) 09.55
	22.45	21.16	30 07.20 (19) 19.35	17.59	15.35	15.05
23	04.32	05.55	06.51 (19) 07.15	08.35	09.02 (20) 09.02	09.55 (21) 09.55
	22.43	21.12	28 07.19 (19) 19.32	17.56	15.33	15.05
24	04.34	05.57	06.51 (19) 07.18	08.38	09.05 (20) 09.05	09.56 (21) 09.56
	22.40	21.09	27 07.18 (19) 19.28	17.53	15.31	15.06
25	04.37	06.00	06.52 (19) 07.20	07.41	09.07 (20) 09.07	09.56 (21) 09.56
	22.38	21.06	25 07.17 (19) 19.25	16.50	15.29	15.07
26	04.39	06.03	06.53 (19) 07.23	07.43	09.10 (20) 09.10	09.56 (21) 09.56
	22.35	21.03	22 07.15 (19) 19.22	16.47	15.27	15.07
27	04.42	06.05	06.56 (19) 07.26	07.46	09.56 (21) 09.13	09.56 (21) 09.56
	22.32	21.00	17 07.13 (19) 19.19	16.44	10 10.06 (21) 15.25	15.08
28	04.44	06.08	06.58 (19) 07.28	07.49	09.53 (21) 09.15	09.56 (21) 09.56
	22.30	20.56	11 07.09 (19) 19.15	16.41	16 10.09 (21) 15.23	15.09
29	04.47	06.10	07.31 (19) 07.52	07.52	09.51 (21) 09.18	09.56 (21) 09.56
	22.27	20.53	19.12	16.38	20 10.11 (21) 15.21	15.11
30	04.50	06.13	07.33 (19) 07.55	07.55	09.50 (21) 09.20	09.56 (21) 09.56
	22.24	20.50	19.09	16.35	23 10.13 (21) 15.19	15.12
31	04.52	06.16	07.57 (19) 07.57	07.57	09.49 (21) 09.49	09.55 (21) 09.55
	22.22	20.47	16.32	16.32	25 10.14 (21) 15.14	15.13
Potential sun hours	579	495	390	311	215	166
Total, worst case		650		306		522
Sun reduction		0,43		0,25		0,16
Oper. time red.		0,88		0,88		0,88
Wind dir. red.		0,59		0,63		0,66
Total reduction		0,23		0,14		0,10
Total, real		147		44		50

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** F - Asuinrakennus F, ~Välisälontie 101
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December			
1	09.55	08.59	10.55 (21)	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22	10.32 (21)	
	15.15	16.32	19	11.14 (21)	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	15.18	16	10.48 (21)
2	09.54	08.57	10.56 (21)	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25	10.33 (21)	
	15.17	16.35	17	11.13 (21)	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	15.16	15	10.48 (21)
3	09.53	08.54	10.57 (21)	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.27	10.34 (21)	
	15.18	16.38	13	11.10 (21)	17.58	20.22	21.44	23.03	23.20	22.13	20.37	18.59	15.15	13	10.47 (21)
4	09.53	08.51	11.01 (21)	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29	10.36 (21)	
	15.20	16.41	6	11.07 (21)	18.01	20.24	21.47	23.05	23.19	22.10	20.34	18.56	15.13	10	10.46 (21)
5	09.52	08.49			07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31	10.38 (21)
	15.22	16.43			18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	15.12	7	10.45 (21)
6	09.51	08.46			07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.33	
	15.24	16.46			18.06	20.30	21.52	23.09	23.16	22.05	20.27	18.49	15.11		
7	09.50	08.43	10.53 (21)		07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17		10.31 (21)
	15.26	16.49	6		18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	15.12	7	10.38 (21)
8	09.48	08.40	10.52 (21)		07.15	06.34	05.01	03.49	03.58	05.14	06.37	07.54	08.20		10.28 (21)
	15.28	16.52	10		18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	15.09	13	10.41 (21)
9	09.47	08.38	10.51 (21)		07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	10.27 (21)	09.39
	15.30	16.55	13		18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	15.07	17	10.44 (21)
10	09.46	08.35	10.51 (21)		07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	10.25 (21)	09.41
	15.33	16.58	14		18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.37	15.04	20	10.45 (21)
11	09.44	08.32	10.49 (21)		07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	10.24 (21)	09.43
	15.35	17.01	11.06 (21)		18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	15.01	22	10.46 (21)
12	09.43	08.29	10.49 (21)		07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	10.24 (21)	09.44
	15.37	17.04	19		18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.09	23	10.47 (21)
13	09.41	08.26	10.49 (21)		06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	10.23 (21)	09.46
	15.40	17.07	19		18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.06	24	10.47 (21)
14	09.39	08.23	10.49 (21)		06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	10.23 (21)	09.47
	15.42	17.10	21		18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.04	26	10.49 (21)
15	09.38	08.20	10.48 (21)		06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	10.23 (21)	09.49
	15.45	17.13	23		18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.01	26	10.49 (21)
16	09.36	08.17	10.48 (21)		06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	10.22 (21)	09.50
	15.47	17.16	23		18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.09	27	10.49 (21)
17	09.34	08.14	10.49 (21)		06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	10.23 (21)	09.51
	15.50	17.18	24		18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.06	27	10.50 (21)
18	09.32	08.11	10.48 (21)		06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	10.23 (21)	09.52
	15.52	17.21	25		18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.04	26	10.49 (21)
19	09.30	08.08	10.48 (21)		06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	10.23 (21)	09.53
	15.55	17.24	26		18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.02	27	10.50 (21)
20	09.28	08.05	10.48 (21)		06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	10.23 (21)	09.54
	15.58	17.27	26		18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.09	27	10.50 (21)
21	09.26	08.02	10.48 (21)		06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.57	10.24 (21)	09.54
	16.00	17.30	26		18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.07	26	10.50 (21)
22	09.24	07.59	10.48 (21)		06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	10.24 (21)	09.55
	16.03	17.33	27		18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.05	26	10.50 (21)
23	09.21	07.56	10.48 (21)		06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	10.25 (21)	09.56
	16.06	17.36	27		18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.03	26	10.51 (21)
24	09.19	07.53	10.49 (21)		06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	10.25 (21)	09.56
	16.09	17.38	26		18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.01	25	10.50 (21)
25	09.17	07.50	10.49 (21)		06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.07	10.26 (21)	09.56
	16.12	17.41	27		18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.09	24	10.50 (21)
26	09.14	07.47	10.49 (21)		06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	10.27 (21)	09.56
	16.14	17.44	27		19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.07	23	10.50 (21)
27	09.12	07.43	10.50 (21)		06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	10.28 (21)	09.56
	16.17	17.47	26		19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.05	22	10.50 (21)
28	09.10	07.40	10.51 (21)		06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	10.28 (21)	09.56
	16.20	17.50	25		19.06	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.03	21	10.49 (21)
29	09.07	07.31	10.51 (21)		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	10.30 (21)	09.56
	16.23	17.51	25		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.01	20	10.50 (21)
30	09.05	07.21	10.52 (21)		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	10.31 (21)	09.56
	16.26	17.51	23		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.09	18	10.49 (21)
31	09.02	07.11	10.53 (21)		07.00	04.13	04.03	03.44	04.52	06.16	07.37	07.57	09.25	10.32 (21)	09.56
	16.29	17.51	22		20.14	21.37	22.57	23.22	22.22	20.47	18.16	16.32	15.13		
Potential sun hours	194	247		364	443	547	586	579	495	390	311	215	166		61
Total, worst case	547		55									543			0.11
Sun reduction	0,16		0,32									0,16			0,11
Oper. time red.	0,88		0,88									0,88			0,88
Wind dir. red.	0,66		0,66									0,66			0,66
Total reduction	0,09		0,19									0,10			0,06
Total, real	51		10									52			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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	
1	09.55	08.59	07.37	08.31 (22)	06.57	07.34 (20)	05.21
	15.15	16.32	17.52	18	08.49 (22)	20.16	54
2	09.54	08.57	07.34	08.31 (22)	06.54	07.33 (20)	05.18
	15.17	16.35	17.55	16	08.47 (22)	20.19	52
3	09.53	08.54	07.31	08.32 (22)	06.50	07.33 (20)	05.15
	15.19	16.38	17.58	14	08.46 (22)	20.22	49
4	09.53	08.51	07.28	08.34 (22)	06.47	07.33 (20)	05.12
	15.20	16.41	18.01	10	08.44 (22)	20.24	47
5	09.52	08.49	07.24	07.24	06.44	07.34 (20)	05.09
	15.22	16.44	18.04	20.27	41	08.46 (21)	21.49
6	09.51	08.46	07.21	06.41	07.35 (20)	05.06	03.52
	15.24	16.47	18.06	20.30	36	08.44 (21)	21.52
7	09.49	08.43	07.18	06.37	07.37 (20)	05.04	03.51
	15.26	16.49	18.09	20.32	25	08.40 (21)	21.55
8	09.48	08.40	07.15	06.34	08.25 (21)	05.01	03.50
	15.28	16.52	18.12	20.35	12	08.37 (21)	21.58
9	09.47	08.37	07.12	06.31	06.31	04.58	03.48
	15.30	16.55	18.15	20.38	22.00	23.14	19
10	09.46	08.35	07.08	06.28	04.55	03.47	05.12 (19)
	15.33	16.58	18.17	20.40	22.03	23.16	19
11	09.44	08.32	07.05	06.24	04.52	03.46	05.13 (19)
	15.35	17.01	18.20	20.43	22.06	23.17	18
12	09.43	08.29	07.02	06.21	04.49	03.45	05.13 (19)
	15.37	17.04	18.23	20.46	22.09	23.18	18
13	09.41	08.26	06.59	06.18	04.46	03.44	05.14 (19)
	15.40	17.07	18.25	20.49	22.12	23.19	18
14	09.39	08.23	06.56	06.15	04.44	03.44	05.14 (19)
	15.42	17.10	18.28	20.51	22.14	23.21	17
15	09.38	08.20	06.52	06.12	04.41	03.43	05.14 (19)
	15.45	17.13	18.31	20.54	22.17	23.22	17
16	09.36	08.17	06.49	06.08	04.38	03.42	05.15 (19)
	15.47	17.16	18.33	2	07.41 (21)	20.57	22.20
17	09.34	08.14	06.46	07.32 (21)	06.05	04.36	05.16 (19)
	15.50	17.19	18.36	15	07.47 (21)	21.00	22.22
18	09.32	08.11	06.43	07.28 (21)	06.02	04.33	05.14 (19)
	15.52	17.21	18.39	21	07.49 (21)	21.02	22.25
19	09.30	08.08	06.39	07.26 (21)	05.59	04.30	05.12 (19)
	15.55	17.24	18.42	25	07.51 (21)	21.05	22.28
20	09.28	08.05	06.36	07.24 (21)	05.56	04.28	05.10 (19)
	15.58	17.27	7	08.45 (22)	18.44	28	07.52 (21)
21	09.26	08.02	06.33	07.22 (21)	05.52	04.25	05.10 (19)
	16.01	17.30	12	08.47 (22)	18.47	30	07.52 (21)
22	09.24	07.59	06.30	07.21 (21)	05.49	04.23	05.09 (19)
	16.03	17.33	16	08.49 (22)	18.50	32	07.53 (21)
23	09.21	07.56	06.26	07.20 (21)	05.46	04.20	05.10 (19)
	16.06	17.36	18	08.49 (22)	18.52	34	07.54 (21)
24	09.19	07.53	06.23	07.20 (21)	05.43	04.18	05.09 (19)
	16.09	17.38	20	08.50 (22)	18.55	35	07.55 (21)
25	09.17	07.50	06.20	07.18 (21)	05.40	04.16	05.09 (19)
	16.12	17.41	20	08.50 (22)	18.58	36	07.54 (21)
26	09.14	07.47	06.17	07.18 (21)	05.37	04.13	05.08 (19)
	16.15	17.44	21	08.51 (22)	19.00	36	07.54 (21)
27	09.12	07.43	06.13	06.43 (20)	05.34	04.11	05.08 (19)
	16.17	17.47	20	08.50 (22)	19.03	45	07.55 (21)
28	09.10	07.40	06.10	06.39 (20)	05.31	04.09	05.09 (19)
	16.20	17.50	20	08.50 (22)	19.06	49	07.53 (21)
29	09.07		07.07	07.36 (20)	05.28	04.07	05.08 (19)
	16.23		20.08	53	08.53 (21)	21.33	22.53
30	09.05		07.03	07.34 (20)	05.24	04.05	05.09 (19)
	16.26		20.11	54	08.53 (21)	21.35	22.55
31	09.02		07.00	07.34 (20)		04.03	05.09 (19)
	16.29		20.14	54	08.52 (21)	22.57	22
Potential sun hours	194	247	364	443	547	586	
Total, worst case		154	607	316	278	540	
Sun reduction		0,32	0,36	0,45	0,50	0,47	
Oper. time red.		0,88	0,88	0,88	0,88	0,88	
Wind dir. red.		0,63	0,60	0,60	0,63	0,63	
Total reduction		0,18	0,19	0,24	0,28	0,26	
Total, real		27	116	75	77	140	

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** G - Asuinrakennus G, ~Kankaanpääntie 468
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December			
1	03.48	05.17 (19)	04.55	06.18	07.36	08.00	09.22		
	23.22	19 05.36 (19)	22.19	20.44	19.06	16.29	15.18		
2	03.49	05.17 (19)	04.58	06.21	07.39	08.03	09.25		
	23.21	19 05.36 (19)	22.16	20.40	19.02	16.26	15.16		
3	03.50	05.17 (19)	05.01	06.24	07.41	08.06	09.27		
	23.20	19 05.36 (19)	22.13	20.37	18.59	16.23	15.15		
4	03.52	05.17 (19)	05.03	06.26	08.22 (21)	07.44	08.09	09.29	
	23.19	20 05.37 (19)	22.10	20.34	12 08.34 (21)	18.56	16.21	15.13	
5	03.53	05.17 (19)	05.06	06.29	07.34 (20)	07.46	08.12	09.31	
	23.18	20 05.37 (19)	22.07	20.31	25 08.37 (21)	18.53	16.18	15.12	
6	03.55	05.17 (19)	05.09	06.31	07.31 (20)	07.49	08.15	09.33	
	23.16	20 05.37 (19)	22.04	20.27	35 08.39 (21)	18.50	16.15	15.11	
7	03.57	05.17 (19)	05.11	06.34	07.29 (20)	07.52	08.17	09.35	
	23.15	21 05.38 (19)	22.02	20.24	42 08.41 (21)	18.46	16.12	15.10	
8	03.58	05.17 (19)	05.14	06.37	07.28 (20)	07.54	08.20	09.37	
	23.13	21 05.38 (19)	21.59	20.21	46 08.42 (21)	18.43	16.10	15.09	
9	04.00	05.17 (19)	05.17	06.39	07.27 (20)	07.57	09.11 (22)	08.23	09.39
	23.12	22 05.39 (19)	21.56	20.18	50 08.43 (21)	18.40	5 09.16 (22)	16.07	15.08
10	04.02	05.17 (19)	05.20	06.42	07.26 (20)	08.00	09.08 (22)	08.26	09.41
	23.10	21 05.38 (19)	21.53	20.14	52 08.43 (21)	18.37	12 09.20 (22)	16.04	15.07
11	04.04	05.17 (19)	05.22	06.44	07.26 (20)	08.02	09.05 (22)	08.29	09.43
	23.08	22 05.39 (19)	21.50	20.11	53 08.44 (21)	18.34	15 09.20 (22)	16.02	15.06
12	04.06	05.18 (19)	05.25	06.47	07.25 (20)	08.05	09.04 (22)	08.32	09.44
	23.07	21 05.39 (19)	21.47	20.08	55 08.44 (21)	18.30	18 09.22 (22)	15.59	15.05
13	04.08	05.17 (19)	05.28	06.50	07.26 (20)	08.08	09.03 (22)	08.34	09.46
	23.05	22 05.39 (19)	21.44	20.05	54 08.44 (21)	18.27	19 09.22 (22)	15.56	15.05
14	04.10	05.17 (19)	05.30	06.52	07.26 (20)	08.10	09.03 (22)	08.37	09.47
	23.03	22 05.39 (19)	21.41	20.01	53 08.44 (21)	18.24	20 09.23 (22)	15.54	15.04
15	04.13	05.18 (19)	05.33	06.55	07.29 (20)	08.13	09.02 (22)	08.40	09.49
	23.01	22 05.40 (19)	21.37	19.58	49 08.44 (21)	18.21	21 09.23 (22)	15.51	15.04
16	04.15	05.18 (19)	05.36	06.57	07.31 (20)	08.16	09.02 (22)	08.43	09.50
	22.59	22 05.40 (19)	21.34	19.55	45 08.43 (21)	18.18	21 09.23 (22)	15.49	15.04
17	04.17	05.18 (19)	05.39	07.00	07.34 (20)	08.19	09.02 (22)	08.46	09.51
	22.57	22 05.40 (19)	21.31	19.51	38 08.43 (21)	18.15	20 09.22 (22)	15.46	15.04
18	04.19	05.18 (19)	05.41	07.02	08.06 (21)	08.21	09.02 (22)	08.49	09.52
	22.54	21 05.39 (19)	21.28	19.48	36 08.42 (21)	18.11	20 09.22 (22)	15.44	15.04
19	04.22	05.18 (19)	05.44	07.05	08.06 (21)	08.24	09.03 (22)	08.51	09.53
	22.52	21 05.39 (19)	21.25	19.45	36 08.42 (21)	18.08	18 09.21 (22)	15.42	15.04
20	04.24	05.18 (19)	05.47	07.08	08.06 (21)	08.27	09.04 (22)	08.54	09.54
	22.50	20 05.38 (19)	21.22	19.42	34 08.40 (21)	18.05	16 09.20 (22)	15.39	15.04
21	04.27	05.19 (19)	05.49	07.10	08.07 (21)	08.29	09.07 (22)	08.57	09.54
	22.47	19 05.38 (19)	21.19	19.38	32 08.39 (21)	18.02	11 09.18 (22)	15.37	15.04
22	04.29	05.20 (19)	05.52	07.13	08.07 (21)	08.32	09.10 (22)	08.59	09.55
	22.45	19 05.39 (19)	21.16	19.35	31 08.38 (21)	17.59	5 09.15 (22)	15.35	15.05
23	04.32	05.21 (19)	05.55	07.15	08.08 (21)	08.35	09.02	09.02	09.55
	22.43	17 05.38 (19)	21.12	19.32	28 08.36 (21)	17.56	15.33	15.05	
24	04.34	05.22 (19)	05.57	07.18	08.09 (21)	08.38	09.05	09.05	09.56
	22.40	15 05.37 (19)	21.09	19.29	26 08.35 (21)	17.53	15.31	15.06	
25	04.37	05.23 (19)	06.00	07.20	08.10 (21)	07.41	09.07	09.07	09.56
	22.38	13 05.36 (19)	21.06	19.25	22 08.32 (21)	16.50	15.29	15.07	
26	04.39	05.25 (19)	06.03	07.23	08.13 (21)	07.43	09.10	09.10	09.56
	22.35	9 05.34 (19)	21.03	19.22	17 08.30 (21)	16.47	15.27	15.07	
27	04.42	05.27 (19)	06.05	07.26	08.16 (21)	07.46	09.13	09.13	09.56
	22.32	5 05.32 (19)	21.00	19.19	9 08.25 (21)	16.44	15.25	15.08	
28	04.45	06.08	07.28	07.49	07.49	07.49	09.15	09.15	09.56
	22.30	20.56	19.15	16.41	16.41	16.41	15.23	15.10	
29	04.47	06.11	07.31	07.52	07.52	07.52	09.18	09.18	09.56
	22.27	20.53	19.12	16.38	16.38	16.38	15.21	15.11	
30	04.50	06.13	07.33	07.55	07.55	07.55	09.20	09.20	09.56
	22.24	20.50	19.09	16.35	16.35	16.35	15.20	15.12	
31	04.53	06.16	07.37	07.57	07.57	07.57	09.25	09.25	09.55
	22.22	20.47	19.06	16.32	16.32	16.32	15.13	15.13	
Potential sun hours	578	495	390	311		215	166		
Total, worst case	514		880		221				
Sun reduction	0,48		0,36		0,25				
Oper. time red.	0,88		0,88		0,88				
Wind dir. red.	0,63		0,60		0,63				
Total reduction	0,27		0,19		0,14				
Total, real	136		167		31				

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** H - Lomarakennus H, ~Kankaanpääntie 320
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.01	06.24	07.41	08.06	09.27
	15.19	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.41	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.25	06.44	05.09	03.54	03.53	05.06	06.29	07.47	08.12	09.31
	15.22	16.43	18.04	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.50	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.37	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.09
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.15	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.08
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.34	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.50	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.05	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.12	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.45	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.15	15.46	15.04
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.04
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.42	15.04
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.47	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.30	08.57	09.54
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.05
23	09.21	07.56	06.26	05.46	04.20	03.41	04.32	05.55	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.29	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.25	22.38	21.06	19.25	16.50	15.29	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.03	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.31	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.11
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

Calculation: Paholammi_VE2_Shadow_Forest_20211130**Shadow receptor:** I - Asuinrakennus I, ~Kankaanpääntie 218
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.23
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.18
2	09.54	08.57	07.34	06.54	05.18	03.59	03.49	04.58	06.21	07.39	08.03	09.25
	15.17	16.35	17.55	20.19	21.41	23.02	23.21	22.16	20.40	19.02	16.26	15.16
3	09.54	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.24	07.41	08.06	09.27
	15.18	16.38	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.15
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.21	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.41	05.06	03.52	03.55	05.09	06.31	07.49	08.15	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.05	20.27	18.49	16.15	15.11
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.37	07.54	08.20	09.38
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.38	07.12	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.01	23.14	23.12	21.56	20.18	18.40	16.07	15.07
10	09.46	08.35	07.08	06.28	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.41	22.03	23.16	23.10	21.53	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.19	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.35	09.46
	15.40	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.05
14	09.39	08.23	06.56	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.41	20.01	18.24	15.54	15.04
15	09.38	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.49
	15.44	17.13	18.31	20.54	22.17	23.22	23.01	21.38	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.16	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.19	08.46	09.51
	15.50	17.18	18.36	21.00	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.43	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.55	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.42	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.56	04.28	03.41	04.24	05.46	07.08	08.27	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.42	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.55
	16.00	17.30	18.47	21.11	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.30	05.49	04.23	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.50	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.36	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.50	06.20	05.40	04.15	03.42	04.37	06.00	07.20	07.41	09.08	09.56
	16.12	17.41	18.58	21.22	22.43	23.26	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.47	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.34	04.11	03.43	04.42	06.05	07.26	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.06	21.30	22.50	23.24	22.30	20.57	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.56
	16.29		20.14		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

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

SHADOW - Calendar

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
Assumptions for shadow calculations Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January		February		March		April		May		June	
1	09.55	12.13 (20)	08.59		14.15 (19)	07.37		09.40 (23)	06.57	05.21	04.01	
	15.15	21	12.34 (20)	16.32	37	14.52 (19)	17.52	12	09.52 (23)	20.16	21.38	22.59
2	09.54	12.14 (20)	08.57		14.15 (19)	07.34			06.53	05.18	03.59	
	15.17	21	12.35 (20)	16.35	37	14.52 (19)	17.55		20.19	21.41	23.01	
3	09.53	12.15 (20)	08.54		14.14 (19)	07.31			06.50	05.15	03.57	
	15.18	20	12.35 (20)	16.37	38	14.52 (19)	17.58		20.22	21.44	23.03	
4	09.53	12.15 (20)	08.51		14.14 (19)	07.28			06.47	05.12	03.55	
	15.20	20	12.35 (20)	16.40	38	14.52 (19)	18.01		20.24	21.47	23.05	
5	09.52	12.16 (20)	08.49		14.14 (19)	07.24			06.44	05.09	03.54	
	15.22	20	12.36 (20)	16.43	39	14.53 (19)	18.03		20.27	21.49	23.07	
6	09.51	12.17 (20)	08.46		09.42 (23)	07.21			06.40	05.06	03.52	
	15.24	19	12.36 (20)	16.46	51	14.53 (19)	18.06		20.30	21.52	23.09	
7	09.50	12.17 (20)	08.43		09.39 (23)	07.18			06.37	05.03	03.51	
	15.26	19	12.36 (20)	16.49	58	14.54 (19)	18.09		20.32	21.55	23.11	
8	09.48	12.17 (20)	08.40		09.36 (23)	07.15			06.34	05.00	03.49	
	15.28	19	12.36 (20)	16.52	61	14.53 (19)	18.12		20.35	21.58	23.13	
9	09.47	12.18 (20)	08.37		09.35 (23)	07.12			06.31	04.57	03.48	
	15.30	18	12.36 (20)	16.55	64	14.53 (19)	18.14		20.38	22.00	23.14	
10	09.46	12.20 (20)	08.35		09.34 (23)	07.08			06.27	04.55	03.47	
	15.32	17	12.37 (20)	16.58	65	14.53 (19)	18.17		20.40	22.03	23.16	
11	09.44	12.20 (20)	08.32		09.33 (23)	07.05			06.24	04.52	03.46	
	15.35	16	12.36 (20)	17.01	67	14.53 (19)	18.20		20.43	22.06	23.17	
12	09.43	12.21 (20)	08.29		09.32 (23)	07.02			06.21	04.49	03.45	
	15.37	15	12.36 (20)	17.04	68	14.52 (19)	18.23		20.46	22.09	23.18	
13	09.41	12.22 (20)	08.26		09.31 (23)	06.59			06.18	04.46	03.44	
	15.39	14	12.36 (20)	17.07	67	14.51 (19)	18.25		20.49	22.12	23.20	
14	09.39	12.24 (20)	08.23		09.31 (23)	06.55			06.15	04.43	03.43	
	15.42	11	12.35 (20)	17.10	67	14.51 (19)	18.28		20.51	22.14	23.21	
15	09.38	12.25 (20)	08.20		09.31 (23)	06.52			06.11	04.41	03.42	
	15.44	9	12.34 (20)	17.13	65	14.50 (19)	18.31		20.54	22.17	23.22	
16	09.36	12.29 (20)	08.17		09.30 (23)	06.49			06.08	04.38	03.42	
	15.47	2	12.31 (20)	17.15	64	14.48 (19)	18.33		20.57	22.20	23.23	
17	09.34		08.14		09.30 (23)	06.46			06.05	04.35	03.41	
	15.50		17.18	61	14.47 (19)	18.36			20.59	22.22	23.23	
18	09.32		08.11		09.30 (23)	06.42			06.02	04.33	03.41	
	15.52		17.21	57	14.45 (19)	18.39			21.02	22.25	23.24	
19	09.30		08.08		09.30 (23)	06.39			05.59	04.30	03.41	
	15.55		17.24	53	14.43 (19)	18.41			21.05	22.28	23.25	
20	09.28	14.27 (19)	08.05		09.30 (23)	06.36			05.55	04.27	03.41	
	15.58	4	14.31 (19)	17.27	42	14.38 (19)	18.44		21.08	22.30	23.25	
21	09.26	14.23 (19)	08.02		09.30 (23)	06.33			05.52	04.25	03.41	
	16.00	13	14.36 (19)	17.30	34	10.04 (23)	18.47		21.10	22.33	23.25	
22	09.24	14.21 (19)	07.59		09.31 (23)	06.29			05.49	04.23	03.41	
	16.03	18	14.39 (19)	17.33	33	10.04 (23)	18.49		21.13	22.36	23.26	
23	09.21	14.20 (19)	07.56		09.31 (23)	06.26			05.46	04.20	03.41	
	16.06	21	14.41 (19)	17.35	32	10.03 (23)	18.52		21.16	22.38	23.26	
24	09.19	14.19 (19)	07.53		09.32 (23)	06.23			05.43	04.18	03.42	
	16.09	24	14.43 (19)	17.38	30	10.02 (23)	18.55		21.19	22.41	23.26	
25	09.17	14.18 (19)	07.50		09.33 (23)	06.20			05.40	04.15	03.42	
	16.11	26	14.44 (19)	17.41	28	10.01 (23)	18.57		21.21	22.43	23.25	
26	09.14	14.17 (19)	07.46		09.33 (23)	06.16			05.37	04.13	03.43	
	16.14	29	14.46 (19)	17.44	26	09.59 (23)	19.00		21.24	22.46	23.25	
27	09.12	14.16 (19)	07.43		09.35 (23)	06.13			05.33	04.11	03.43	
	16.17	31	14.47 (19)	17.47	23	09.58 (23)	19.03		21.27	22.48	23.25	
28	09.10	14.16 (19)	07.40		09.37 (23)	06.10			05.30	04.09	03.44	
	16.20	32	14.48 (19)	17.50	19	09.56 (23)	19.05		21.30	22.50	23.24	
29	09.07	14.15 (19)				07.07			05.27	04.07	03.45	
	16.23	34	14.49 (19)			20.08			21.33	22.53	23.24	
30	09.04	14.15 (19)				07.03			05.24	04.04	03.46	
	16.26	35	14.50 (19)			20.11			21.35	22.55	23.23	
31	09.02	14.15 (19)				07.00				04.03		
	16.29	36	14.51 (19)			20.13				22.57		
Potential sun hours	194		247		364		443		547		586	
Total, worst case	564		1324		12							
Sun reduction	0,16		0,32		0,36							
Oper. time red.	0,88		0,88		0,88							
Wind dir. red.	0,67		0,64		0,62							
Total reduction	0,10		0,18		0,20							
Total, real	54		242		2							

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** J - Asuinrakennus J, ~Penkkinevantie 85
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December	
1	03.47	04.55	06.18	07.36	08.00	09.04 (23) 09.22	12.02 (20)
	23.22	22.19	20.44	19.06	16.29	64 14.22 (19) 15.18	16 12.18 (20)
2	03.49	04.58	06.21	07.38	08.03	09.05 (23) 09.25	12.02 (20)
	23.21	22.16	20.40	19.02	16.26	62 14.22 (19) 15.16	17 12.19 (20)
3	03.50	05.00	06.23	07.41	08.06	09.07 (23) 09.27	12.02 (20)
	23.20	22.13	20.37	18.59	16.23	60 14.23 (19) 15.15	18 12.20 (20)
4	03.51	05.03	06.26	07.44	08.09	09.09 (23) 09.29	12.02 (20)
	23.19	22.10	20.34	18.56	16.20	56 14.23 (19) 15.13	18 12.20 (20)
5	03.53	05.06	06.29	07.46	08.12	09.12 (23) 09.31	12.02 (20)
	23.18	22.07	20.31	18.53	16.18	50 14.23 (19) 15.12	19 12.21 (20)
6	03.54	05.08	06.31	07.49	08.14	13.43 (19) 09.33	12.02 (20)
	23.16	22.04	20.27	18.49	16.15	40 14.23 (19) 15.11	20 12.22 (20)
7	03.56	05.11	06.34	07.52	08.17	13.44 (19) 09.35	12.03 (20)
	23.15	22.02	20.24	18.46	16.12	39 14.23 (19) 15.09	19 12.22 (20)
8	03.58	05.14	06.36	07.54	08.20	13.44 (19) 09.37	12.03 (20)
	23.14	21.59	20.21	18.43	16.09	39 14.23 (19) 15.08	20 12.23 (20)
9	04.00	05.17	06.39	07.57	08.23	13.44 (19) 09.39	12.04 (20)
	23.12	21.56	20.17	18.40	16.07	38 14.22 (19) 15.07	20 12.24 (20)
10	04.02	05.19	06.42	08.00	08.26	13.45 (19) 09.41	12.04 (20)
	23.10	21.53	20.14	18.37	16.04	37 14.22 (19) 15.07	20 12.24 (20)
11	04.04	05.22	06.44	08.02	08.29	13.46 (19) 09.43	12.04 (20)
	23.09	21.50	20.11	18.33	16.01	36 14.22 (19) 15.06	20 12.24 (20)
12	04.06	05.25	06.47	08.05	10.16 (23) 08.32	13.47 (19) 09.44	12.05 (20)
	23.07	21.47	20.08	18.30	6 10.22 (23) 15.59	35 14.22 (19) 15.05	20 12.25 (20)
13	04.08	05.27	06.49	08.08	10.11 (23) 08.34	13.47 (19) 09.46	12.05 (20)
	23.05	21.44	20.04	18.27	16 10.27 (23) 15.56	34 14.21 (19) 15.05	21 12.26 (20)
14	04.10	05.30	06.52	08.10	10.09 (23) 08.37	13.49 (19) 09.47	12.06 (20)
	23.03	21.40	20.01	18.24	20 10.29 (23) 15.54	32 14.21 (19) 15.04	20 12.26 (20)
15	04.12	05.33	06.55	08.13	10.07 (23) 08.40	13.49 (19) 09.49	12.06 (20)
	23.01	21.37	19.58	18.21	24 10.31 (23) 15.51	31 14.20 (19) 15.04	21 12.27 (20)
16	04.14	05.36	06.57	08.16	10.05 (23) 08.43	13.50 (19) 09.50	12.06 (20)
	22.59	21.34	19.55	18.18	28 10.33 (23) 15.49	29 14.19 (19) 15.03	20 12.26 (20)
17	04.17	05.38	07.00	08.18	10.04 (23) 08.46	13.52 (19) 09.51	12.07 (20)
	22.57	21.31	19.51	18.14	30 10.34 (23) 15.46	26 14.18 (19) 15.03	20 12.27 (20)
18	04.19	05.41	07.02	08.21	10.03 (23) 08.49	13.53 (19) 09.52	12.07 (20)
	22.54	21.28	19.48	18.11	31 10.34 (23) 15.44	24 14.17 (19) 15.03	21 12.28 (20)
19	04.21	05.44	07.05	08.24	10.02 (23) 08.51	13.55 (19) 09.53	12.07 (20)
	22.52	21.25	19.45	18.08	33 10.35 (23) 15.41	21 14.16 (19) 15.03	21 12.28 (20)
20	04.24	05.46	07.07	08.27	10.02 (23) 08.54	13.56 (19) 09.54	12.08 (20)
	22.50	21.22	19.41	18.05	33 10.35 (23) 15.39	18 14.14 (19) 15.04	21 12.29 (20)
21	04.26	05.49	07.10	08.29	10.01 (23) 08.57	13.59 (19) 09.54	12.09 (20)
	22.47	21.19	19.38	18.02	35 10.36 (23) 15.37	13 14.12 (19) 15.04	20 12.29 (20)
22	04.29	05.52	07.13	08.32	10.01 (23) 08.59	14.03 (19) 09.55	12.09 (20)
	22.45	21.16	19.35	17.59	46 15.11 (19) 15.35	5 14.08 (19) 15.04	20 12.29 (20)
23	04.31	05.54	07.15	08.35	10.00 (23) 09.02	09.55	12.10 (20)
	22.43	21.12	19.32	17.56	55 15.14 (19) 15.33	15.05	20 12.30 (20)
24	04.34	05.57	07.18	08.38	10.00 (23) 09.05	09.56	12.10 (20)
	22.40	21.09	19.28	17.53	58 15.16 (19) 15.30	15.05	21 12.31 (20)
25	04.36	06.00	07.20	07.40	09.00 (23) 09.07	09.56	12.11 (20)
	22.38	21.06	19.25	16.50	62 14.18 (19) 15.28	15.06	20 12.31 (20)
26	04.39	06.02	07.23	07.43	09.00 (23) 09.10	12.08 (20) 09.56	12.11 (20)
	22.35	21.03	19.22	16.47	65 14.19 (19) 15.26	1 12.09 (20) 15.07	20 12.31 (20)
27	04.42	06.05	07.25	07.46	09.00 (23) 09.13	12.05 (20) 09.56	12.12 (20)
	22.32	21.00	19.19	16.44	66 14.20 (19) 15.25	8 12.13 (20) 15.08	20 12.32 (20)
28	04.44	06.08	07.28	07.49	09.00 (23) 09.15	12.03 (20) 09.56	12.12 (20)
	22.30	20.56	19.15	16.41	67 14.20 (19) 15.23	12 12.15 (20) 15.09	20 12.32 (20)
29	04.47	06.10	07.31	07.52	09.01 (23) 09.18	12.03 (20) 09.56	12.12 (20)
	22.27	20.53	19.12	16.38	68 14.21 (19) 15.21	14 12.17 (20) 15.10	20 12.32 (20)
30	04.50	06.13	07.33	07.55	09.02 (23) 09.20	12.03 (20) 09.56	12.13 (20)
	22.24	20.50	19.09	16.35	67 14.22 (19) 15.19	15 12.18 (20) 15.12	20 12.33 (20)
31	04.52	06.16	07.57	09.03 (23)	09.55	12.13 (20)	
	22.22	20.47	16.32	66 14.22 (19)	15.13	21 12.34 (20)	
Potential sun hours	579	495	390	311	215	166	
Total, worst case				876	839	614	
Sun reduction				0,25	0,16	0,11	
Oper. time red.				0,88	0,88	0,88	
Wind dir. red.				0,64	0,66	0,68	
Total reduction				0,14	0,10	0,07	
Total, real				125	80	40	

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: Paholammi_VE2_Shadow_Forest_20211130 **Shadow receptor:** K - Asuinrakennus K, ~Seppäkoskentie 36
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

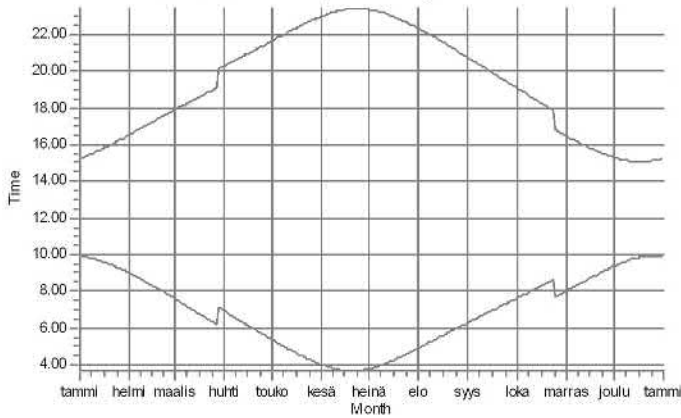
	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.00	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.44	19.06	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.48	04.58	06.21	07.38	08.03	09.25
	15.16	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.22	21.44	23.04	23.20	22.13	20.37	18.59	16.23	15.14
4	09.53	08.51	07.28	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.47	23.06	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.31	18.53	16.18	15.12
6	09.51	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.34
	15.24	16.46	18.06	20.30	21.52	23.09	23.17	22.04	20.27	18.49	16.15	15.10
7	09.50	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.36
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.02	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.13	23.14	21.59	20.21	18.43	16.09	15.08
9	09.47	08.37	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.56	20.17	18.40	16.07	15.07
10	09.46	08.35	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.09	21.50	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.32	09.44
	15.37	17.04	18.23	20.46	22.09	23.18	23.07	21.47	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46
	15.39	17.07	18.25	20.49	22.12	23.20	23.05	21.44	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	15.04
15	09.38	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.49
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.23	22.59	21.34	19.55	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.57	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.49	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.25	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.48	21.19	19.38	18.02	15.37	15.04
22	09.24	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.13	08.32	09.00	09.55
	16.03	17.33	18.49	21.13	22.36	23.26	22.45	21.16	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.56
	16.06	17.35	18.52	21.16	22.38	23.26	22.43	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.41	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.41	23.26	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.50	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.38	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.46	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.13	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.24	15.08
28	09.10	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.18	09.56
	16.23		20.08	21.33	22.53	23.24	22.27	20.53	19.12	16.38	15.21	15.10
30	09.05		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.55	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.22	20.47		16.32		15.13
Potential sun hours	194	247	364	443	548	586	579	495	390	311	215	166
Total, worst case												
Sun reduction												
Oper. time red.												
Wind dir. red.												
Total reduction												
Total, real												

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

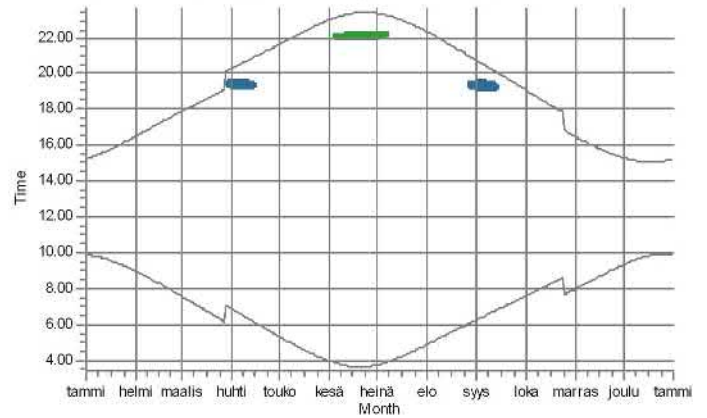
Day in month	Sun rise (hh:mm)	Minutes with flicker	First time (hh:mm) with flicker	(WTG causing flicker first time)
	Sun set (hh:mm)		Last time (hh:mm) with flicker	(WTG causing flicker last time)

SHADOW - Calendar, graphical**Calculation:** Paholammi_VE2_Shadow_Forest_20211130

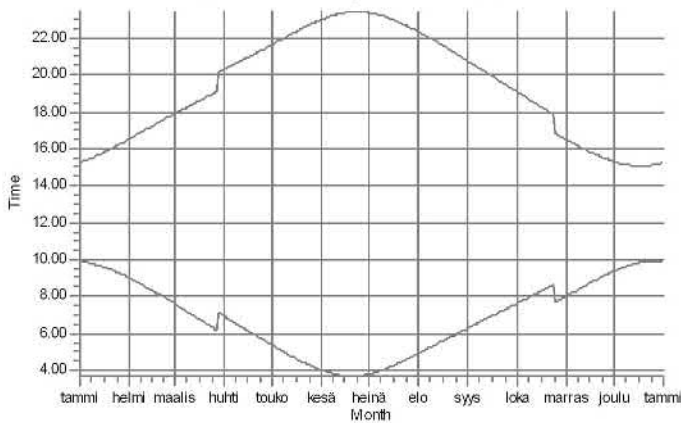
A: Asuinrakennus A, ~Kankaanpääntie 534



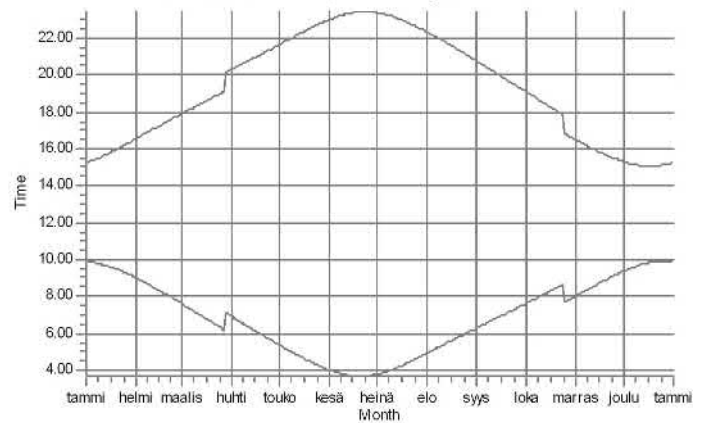
B: Asuinrakennus B, ~Ristiläntie 459



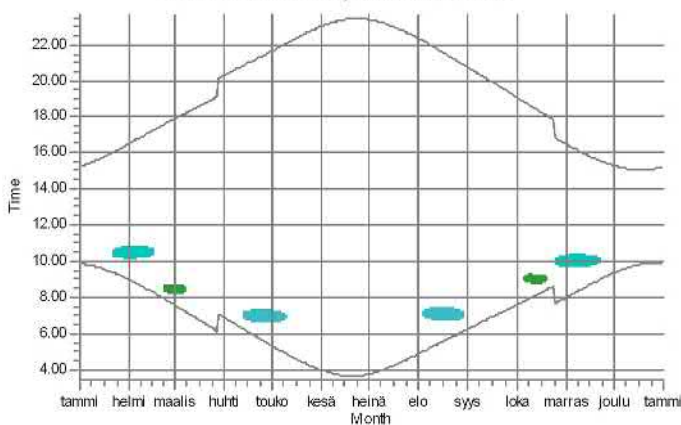
C: Lomarakennus C, ~Variksentie 93



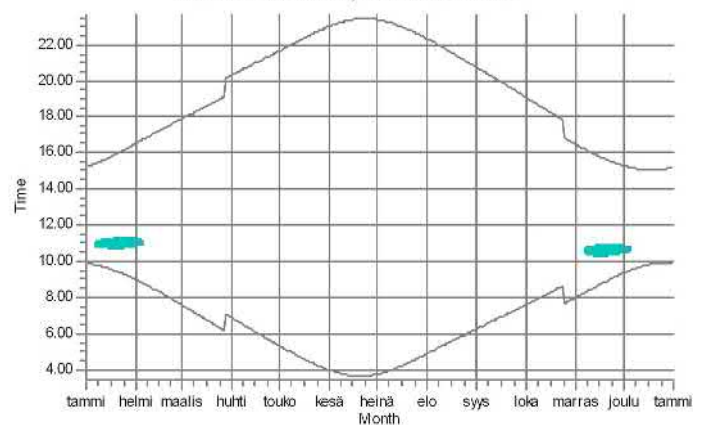
D: Asuinrakennus D, ~Kankaanpääntie 646



E: Asuinrakennus E, ~Välisalontie 130



F: Asuinrakennus F, ~Välisalontie 101



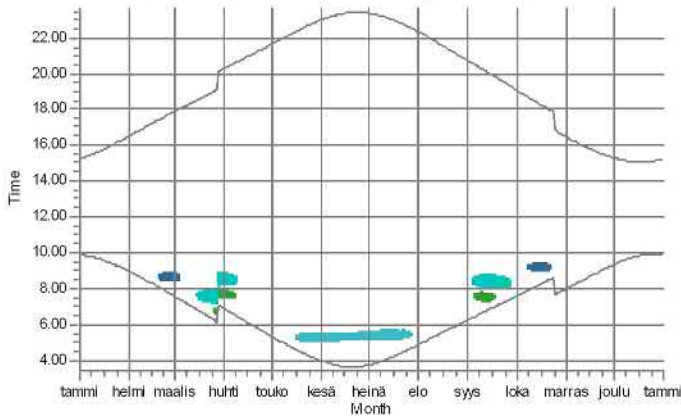
WTGs

- 19: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (730)
- 20: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (731)

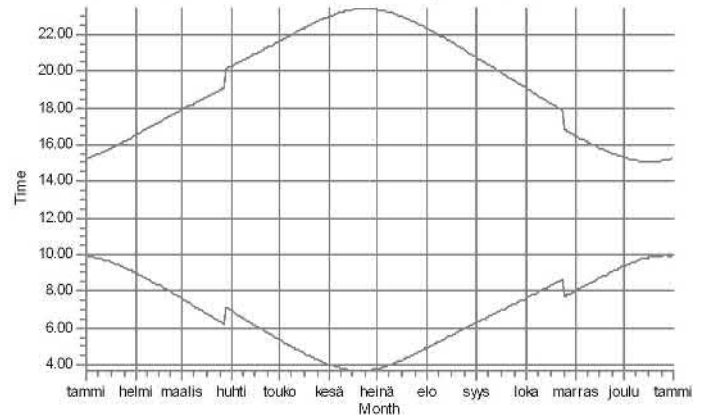
- 21: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (732)
- 22: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (733)

SHADOW - Calendar, graphical**Calculation:** Paholammi_VE2_Shadow_Forest_20211130

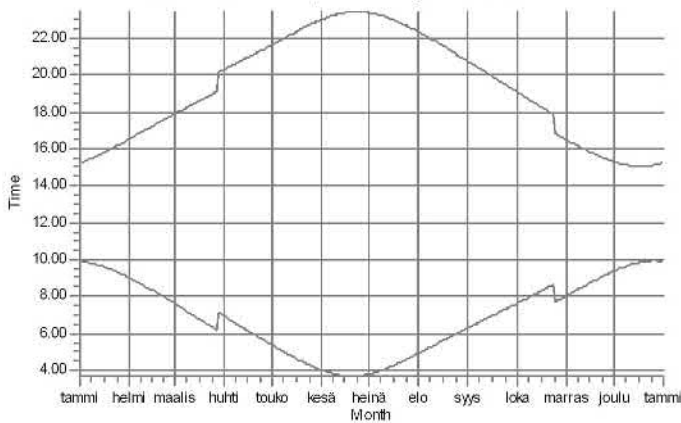
G: Asuinrakennus G, ~Kankaanpääntie 468



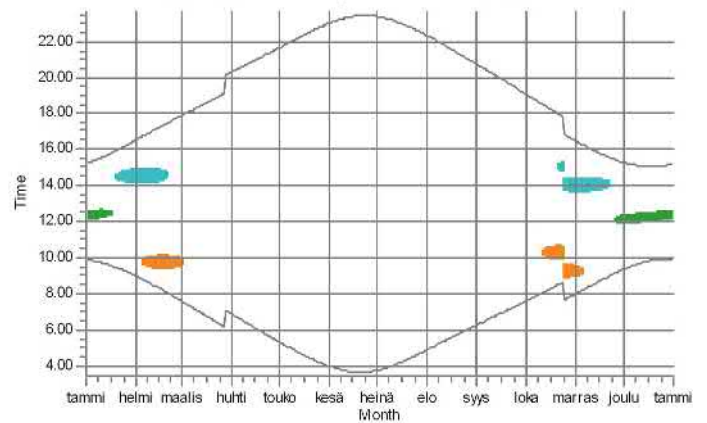
H: Lomarakennus H, ~Kankaanpääntie 320



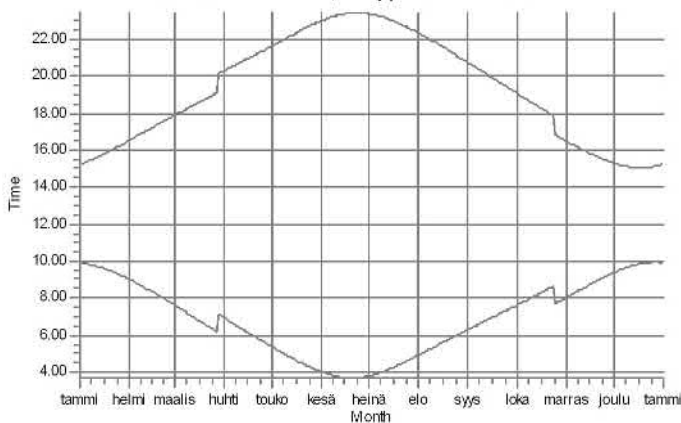
I: Asuinrakennus I, ~Kankaanpääntie 218



J: Asuinrakennus J, ~Penkkinevantie 85



K: Asuinrakennus K, ~Seppäkoskentie 36



WTGs

19: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (730)

20: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (731)

21: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (732)

22: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (733)

23: VESTAS V162-6.0 HH169 6000 162.0 IOI hub: 169,0 m (TOT: 250,0 m) (734)

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 1 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (712)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 2 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (713)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.43	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.49	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 3 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (714)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.43	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.45	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 4 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (715)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1,00	2,82	4,23	6,60	8,77	9,10	8,87	6,80	4,67	2,52	1,17	0,58

Operational time

N	NNE	ENE	E	ESE	SSE	S	SSW	WSW	W	WNW	NNW	Sum
564	465	410	443	549	706	909	1 065	823	683	592	542	7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.55
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 5 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (716

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 6 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (717

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.07	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 7 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (718)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 8 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (719)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.52	16.17	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.16	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.06	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.03
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.32	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.08	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.06	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.49	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 9 - NORDEX N117/2400 2400 116.8 IO! hub: 120,0 m (TOT: 178,4 m) (720

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.17
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.25
	15.17	16.34	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.54	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.10
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.52	20.14	18.36	16.04	15.06
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.43	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.04
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.27	22.59	21.34	19.54	18.17	15.48	15.03
17	09.34	08.14	06.46	06.05	04.35	03.41	04.17	05.38	07.00	08.18	08.46	09.51
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.58	04.30	03.41	04.21	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.27	08.54	09.54
	15.57	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.22	03.41	04.29	05.52	07.12	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.32	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.05
25	09.17	07.49	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.53	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.04	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.02		04.52	06.15		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 10 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (721)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.16	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.58	03.51	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.28
	15.21	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.21	15.14
5	09.51	08.48	07.24	06.44	05.09	03.54	03.54	05.06	06.29	07.46	08.11	09.31
	15.22	16.44	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.04	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.59	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.10	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.38
	15.31	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.48	04.02	05.20	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.37	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.02	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.06
13	09.40	08.25	06.58	06.18	04.46	03.45	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.11	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.05
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.43	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.16	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.20	05.41	07.02	08.21	08.48	09.51
	15.53	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.42	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.56	04.28	03.42	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.42	04.27	05.49	07.10	08.29	08.56	09.54
	16.01	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.21	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.20	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.14	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.15	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.31	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.50	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.31	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.53	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.14
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 11 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (722)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.39	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.24	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.01	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.55
	16.17	17.47	19.03	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.49	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	195	248	364	443	547	585	578	495	390	311	216	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 12 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (723)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 13 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (724)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.01	06.23	07.41	08.05	09.26
	15.19	16.38	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.41	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.53	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.57	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.01	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.49	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.28	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.44	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.13	05.33	06.54	08.13	08.40	09.48
	15.45	17.13	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.36	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.42	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.33	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.42	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.43	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.08
27	09.11	07.43	06.13	05.34	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.09
28	09.09	07.40	06.10	05.30	04.09	03.45	04.45	06.08	07.28	07.49	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.10
29	09.06		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.20	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 14 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (725)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.58	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.12	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.28
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.06	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.22	09.38
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.09	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.17	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.46
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.39	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.22	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.24	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.55
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.14	09.55
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	248	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 15 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (726)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.07
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.36	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.02	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 16 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (727)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.14	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.51	21.25	19.44	18.08	15.41	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.42	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.15	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.48	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 17 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (728)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.54	08.56	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.54	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.26
	15.19	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.56	03.52	05.03	06.26	07.44	08.08	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.52	16.18	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.50	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.09
9	09.46	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	07.59	08.25	09.40
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.44	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.20	20.43	22.06	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.26	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.40	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.44	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.45	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.58	18.21	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.49	15.04
17	09.33	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.45	09.50
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.04
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.39	21.02	22.25	23.23	22.54	21.28	19.48	18.11	15.44	15.04
19	09.29	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.52
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.42	15.04
20	09.27	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.26	08.54	09.53
	15.58	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.02	06.32	05.52	04.25	03.41	04.27	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.47	21.10	22.32	23.25	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32	08.59	09.54
	16.03	17.33	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.05
23	09.21	07.55	06.26	05.46	04.20	03.42	04.32	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.37	23.25	22.42	21.12	19.31	17.56	15.33	15.05
24	09.19	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.37	09.04	09.55
	16.09	17.38	18.55	21.18	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.16	07.49	06.19	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.55
	16.12	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.29	15.07
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.47	23.24	22.32	20.59	19.18	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.45	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.49	19.05	21.29	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.06	05.27	04.07	03.46	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.47	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.11	21.35	22.54	23.22	22.24	20.50	19.09	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 18 - NORDEX N131/3000 3000 131.0 IO! hub: 144,0 m (TOT: 209,5 m) (729)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.54	08.59	07.37	06.56	05.21	04.01	03.47	04.55	06.18	07.36	08.00	09.22
	15.15	16.31	17.52	20.16	21.38	22.59	23.21	22.18	20.43	19.05	16.29	15.18
2	09.53	08.56	07.33	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.34	17.55	20.18	21.40	23.01	23.20	22.15	20.40	19.02	16.26	15.16
3	09.53	08.53	07.30	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.05	09.26
	15.18	16.37	17.58	20.21	21.43	23.03	23.19	22.13	20.37	18.59	16.23	15.14
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.43	08.08	09.29
	15.20	16.40	18.00	20.24	21.46	23.05	23.18	22.10	20.33	18.56	16.20	15.13
5	09.51	08.48	07.24	06.43	05.09	03.54	03.53	05.06	06.28	07.46	08.11	09.31
	15.22	16.43	18.03	20.26	21.49	23.07	23.17	22.07	20.30	18.52	16.17	15.12
6	09.50	08.45	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.29	21.52	23.08	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.51	08.17	09.35
	15.26	16.49	18.09	20.32	21.54	23.10	23.14	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40	07.14	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.11	20.35	21.57	23.12	23.13	21.58	20.20	18.43	16.09	15.08
9	09.46	08.37	07.11	06.30	04.57	03.48	04.00	05.16	06.39	07.57	08.22	09.39
	15.30	16.55	18.14	20.37	22.00	23.13	23.11	21.55	20.17	18.39	16.06	15.07
10	09.45	08.34	07.08	06.27	04.54	03.47	04.02	05.19	06.41	07.59	08.25	09.40
	15.32	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.36	16.04	15.07
11	09.43	08.31	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.28	09.42
	15.35	17.01	18.19	20.43	22.05	23.16	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.28	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.45	22.08	23.18	23.06	21.46	20.07	18.30	15.59	15.05
13	09.40	08.25	06.58	06.18	04.46	03.44	04.08	05.27	06.49	08.07	08.34	09.45
	15.39	17.07	18.25	20.48	22.11	23.19	23.04	21.43	20.04	18.27	15.56	15.05
14	09.39	08.22	06.55	06.14	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.09	18.28	20.51	22.14	23.20	23.02	21.40	20.01	18.24	15.53	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.54	08.13	08.40	09.48
	15.44	17.12	18.30	20.54	22.16	23.21	23.00	21.37	19.57	18.20	15.51	15.04
16	09.35	08.17	06.49	06.08	04.38	03.42	04.14	05.35	06.57	08.15	08.42	09.49
	15.47	17.15	18.33	20.56	22.19	23.22	22.58	21.34	19.54	18.17	15.48	15.03
17	09.33	08.14	06.45	06.05	04.35	03.42	04.17	05.38	06.59	08.18	08.45	09.50
	15.49	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.31	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.51
	15.52	17.21	18.38	21.02	22.24	23.23	22.54	21.28	19.48	18.11	15.44	15.03
19	09.29	08.08	06.39	05.58	04.30	03.41	04.21	05.43	07.05	08.23	08.51	09.52
	15.55	17.24	18.41	21.04	22.27	23.24	22.51	21.24	19.44	18.08	15.41	15.03
20	09.27	08.05	06.36	05.55	04.27	03.41	04.24	05.46	07.07	08.26	08.53	09.53
	15.57	17.27	18.44	21.07	22.30	23.24	22.49	21.21	19.41	18.05	15.39	15.04
21	09.25	08.01	06.32	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.56	09.54
	16.00	17.30	18.46	21.10	22.32	23.24	22.47	21.18	19.38	18.02	15.37	15.04
22	09.23	07.58	06.29	05.49	04.22	03.41	04.29	05.51	07.12	08.32	08.59	09.54
	16.03	17.32	18.49	21.13	22.35	23.25	22.44	21.15	19.35	17.59	15.35	15.04
23	09.21	07.55	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.34	09.02	09.55
	16.06	17.35	18.52	21.15	22.37	23.25	22.42	21.12	19.31	17.56	15.32	15.05
24	09.18	07.52	06.23	05.43	04.18	03.42	04.34	05.57	07.17	08.37	09.04	09.55
	16.08	17.38	18.54	21.18	22.40	23.25	22.39	21.09	19.28	17.53	15.30	15.06
25	09.16	07.49	06.19	05.39	04.15	03.42	04.36	05.59	07.20	07.40	09.07	09.55
	16.11	17.41	18.57	21.21	22.42	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46	06.16	05.36	04.13	03.43	04.39	06.02	07.23	07.43	09.09	09.56
	16.14	17.44	19.00	21.24	22.45	23.24	22.34	21.02	19.21	16.47	15.26	15.07
27	09.11	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.46	19.02	21.26	22.47	23.24	22.32	20.59	19.18	16.44	15.24	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.07	07.28	07.48	09.14	09.56
	16.20	17.49	19.05	21.29	22.50	23.23	22.29	20.56	19.15	16.41	15.23	15.09
29	09.06		07.06	05.27	04.07	03.45	04.47	06.10	07.30	07.51	09.17	09.55
	16.23		20.08	21.32	22.52	23.23	22.26	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.19	09.55
	16.26		20.10	21.35	22.54	23.22	22.24	20.50	19.08	16.35	15.19	15.12
31	09.01		07.00		04.03		04.52	06.15		07.57		09.55
	16.29		20.13		22.56		22.21	20.46		16.32		15.13
Potential sun hours	194	247	364	443	547	585	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 19 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (730
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 14.15-14.52/37 16.32	07.37 17.52	06.57 20.16	05.21 06.44-07.14/30 21.38	04.01 05.09-05.31/22 22.59
2	09.54 15.17	08.57 14.15-14.52/37 16.35	07.34 17.55	06.54 20.19	05.18 06.44-07.13/29 21.41	03.59 05.09-05.31/22 23.01
3	09.53 15.18	08.54 14.14-14.52/38 16.38	07.31 17.58	06.50 20.22	05.15 06.44-07.12/28 21.44	03.57 05.10-05.31/21 23.03
4	09.53 15.20	08.51 14.14-14.52/38 16.40	07.28 18.01	06.47 20.24	05.12 06.46-07.11/25 21.47	03.55 05.10-05.31/21 23.05
5	09.52 15.22	08.49 14.14-14.53/39 16.43	07.24 18.03	06.44 20.27	05.09 06.46-07.10/24 21.49	03.54 05.10-05.31/21 23.07
6	09.51 15.24	08.46 14.14-14.53/39 16.46	07.21 18.06	06.41 20.30	05.06 06.47-07.08/21 21.52	03.52 05.11-05.31/20 23.09
7	09.49 15.26	08.43 14.14-14.54/40 16.49	07.18 18.09	06.37 20.32	05.03 06.49-07.06/17 21.55	03.51 05.11-05.31/20 23.11
8	09.48 15.28	08.40 14.14-14.53/39 16.52	07.15 18.12	06.34 20.35	05.00 06.51-07.04/13 21.58	03.49 05.12-05.31/19 23.13
9	09.47 15.30	08.37 14.14-14.53/39 16.55	07.12 18.14	06.31 20.38	04.58 06.55-07.00/5 22.00	03.48 05.12-05.31/19 23.14
10	09.46 15.32	08.35 14.15-14.53/38 16.58	07.08 18.17	06.28 20.40	04.55 22.03	03.47 05.12-05.31/19 23.16
11	09.44 15.35	08.32 14.15-14.53/38 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 05.13-05.31/18 23.17
12	09.43 15.37	08.29 14.15-14.52/37 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 05.13-05.31/18 23.18
13	09.41 15.40	08.26 14.16-14.51/35 17.07	06.59 18.25	06.18 20.49	04.46 22.11	03.44 05.14-05.32/18 23.20
14	09.39 15.42	08.23 14.17-14.51/34 17.10	06.55 18.28	06.15 20.51	04.43 22.14	03.43 05.14-05.31/17 23.21
15	09.38 15.44	08.20 14.19-14.50/31 17.13	06.52 18.31	06.11 06.56-07.08/12 20.54	04.41 22.17	03.43 05.14-05.31/17 23.22
16	09.36 15.47	08.17 14.19-14.48/29 17.15	06.49 18.33	06.08 06.53-07.10/17 20.57	04.38 22.20	03.42 05.15-05.32/17 23.22
17	09.34 15.50	08.14 14.21-14.47/26 17.18	06.46 18.36	06.05 06.50-07.12/22 20.59	04.35 05.16-05.23/7 22.22	03.42 05.14-05.31/17 23.23
18	09.32 15.52	08.11 14.23-14.45/22 17.21	06.42 18.39	06.02 06.49-07.13/24 21.02	04.33 05.14-05.25/11 22.25	03.41 05.15-05.31/16 23.24
19	09.30 15.55	08.08 14.26-14.43/17 17.24	06.39 18.41	05.59 06.47-07.14/27 21.05	04.30 05.12-05.26/14 22.28	03.41 05.15-05.31/16 23.24
20	09.28 15.58	08.05 14.31-14.38/7 17.27	06.36 18.44	05.55 06.46-07.15/29 21.08	04.28 05.10-05.26/16 22.30	03.41 05.15-05.31/16 23.25
21	09.26 16.00	14.23-14.36/13 17.30	08.02 18.47	06.33 21.10	04.25 05.10-05.27/17 22.33	03.41 05.16-05.32/16 23.25
22	09.24 16.03	14.21-14.39/18 17.33	07.59 18.49	06.29 21.13	04.23 05.09-05.28/19 22.35	03.41 05.16-05.32/16 23.25
23	09.21 16.06	14.20-14.41/21 17.35	07.56 18.52	06.26 21.16	04.20 05.10-05.29/19 22.38	03.41 05.16-05.32/16 23.26
24	09.19 16.09	14.19-14.43/24 17.38	07.53 18.55	06.23 21.19	04.18 05.09-05.30/21 22.41	03.42 05.16-05.32/16 23.25
25	09.17 16.12	14.18-14.44/26 17.41	07.50 18.57	06.20 21.21	04.15 05.09-05.30/21 22.43	03.42 05.17-05.33/16 23.25
26	09.14 16.14	14.17-14.46/29 17.44	07.46 19.00	06.16 21.24	04.13 05.08-05.30/22 22.45	03.43 05.17-05.34/17 23.25
27	09.12 16.17	14.16-14.47/31 17.47	07.43 19.03	06.13 21.27	04.11 05.08-05.30/22 22.48	03.44 05.17-05.33/16 23.25
28	09.09 16.20	14.16-14.48/32 17.50	07.40 19.05	06.10 21.30	04.09 05.09-05.31/22 22.50	03.44 05.17-05.34/17 23.24
29	09.07 16.23	14.15-14.49/34 17.53	07.37 20.08	06.07 21.33	04.07 05.08-05.31/23 22.53	03.45 05.17-05.35/18 23.24
30	09.04 16.26	14.15-14.50/35 17.56	07.34 20.11	06.04 21.35	04.05 05.09-05.31/22 22.55	03.46 05.17-05.35/18 23.23
31	09.02 16.29	14.15-14.51/36 17.59	07.31 20.14	06.01 20.17	04.03 05.09-05.31/22 22.57	03.46 05.17-05.35/18 23.23
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	303	660	0	450	470	540

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-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 19 - VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (730
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July		August		September		October		November		December	
1	03.47	05.17-05.36/19	04.55		06.18	07.36			08.00	13.44-14.22/38	09.22	
	23.22		22.19		20.44	19.06			16.29		15.18	
2	03.49	05.17-05.36/19	04.58		06.21	07.39			08.03	13.44-14.22/38	09.25	
	23.21		22.16		20.40	19.02			16.26		15.16	
3	03.50	05.17-05.36/19	05.00		06.23	07.41			08.06	13.44-14.23/39	09.27	
	23.20		22.13		20.37	18.59			16.23		15.15	
4	03.51	05.17-05.37/20	05.03	07.03-07.12/9	06.26	07.44			08.09	13.44-14.23/39	09.29	
	23.19		22.10		20.34	18.56			16.20		15.13	
5	03.53	05.17-05.37/20	05.06	07.00-07.15/15	06.29	07.46			08.12	13.44-14.23/39	09.31	
	23.18		22.07		20.31	18.53			16.18		15.12	
6	03.55	05.17-05.37/20	05.09	06.58-07.16/18	06.31	07.49			08.14	13.43-14.23/40	09.33	
	23.16		22.04		20.27	18.49			16.15		15.11	
7	03.56	05.17-05.38/21	05.11	06.57-07.18/21	06.34	07.52			08.17	13.44-14.23/39	09.35	
	23.15		22.01		20.24	18.46			16.12		15.10	
8	03.58	05.17-05.38/21	05.14	06.55-07.19/24	06.37	07.54			08.20	13.44-14.23/39	09.37	
	23.13		21.59		20.21	18.43			16.09		15.08	
9	04.00	05.17-05.39/22	05.17	06.55-07.21/26	06.39	07.57			08.23	13.44-14.22/38	09.39	
	23.12		21.56		20.17	18.40			16.07		15.07	
10	04.02	05.17-05.38/21	05.19	06.53-07.21/28	06.42	08.00			08.26	13.45-14.22/37	09.41	
	23.10		21.53		20.14	18.37			16.04		15.07	
11	04.04	05.17-05.39/22	05.22	06.52-07.21/29	06.44	08.02			08.29	13.46-14.22/36	09.43	
	23.08		21.50		20.11	18.33			16.01		15.06	
12	04.06	05.18-05.39/21	05.25	06.52-07.22/30	06.47	08.05			08.32	13.47-14.22/35	09.44	
	23.07		21.47		20.08	18.30			15.59		15.05	
13	04.08	05.17-05.39/22	05.28	06.51-07.22/31	06.49	08.08			08.34	13.47-14.21/34	09.46	
	23.05		21.44		20.04	18.27			15.56		15.05	
14	04.10	05.17-05.39/22	05.30	06.51-07.23/32	06.52	08.10			08.37	13.49-14.21/32	09.47	
	23.03		21.40		20.01	18.24			15.54		15.04	
15	04.12	05.18-05.40/22	05.33	06.50-07.23/33	06.55	08.13			08.40	13.49-14.20/31	09.49	
	23.01		21.37		19.58	18.21			15.51		15.04	
16	04.15	05.18-05.40/22	05.36	06.50-07.23/33	06.57	08.16			08.43	13.50-14.19/29	09.50	
	22.59		21.34		19.55	18.18			15.49		15.04	
17	04.17	05.18-05.40/22	05.38	06.50-07.23/33	07.00	08.18			08.46	13.52-14.18/26	09.51	
	22.57		21.31		19.51	18.14			15.46		15.03	
18	04.19	05.18-05.39/21	05.41	06.49-07.22/33	07.02	08.21			08.48	13.53-14.17/24	09.52	
	22.54		21.28		19.48	18.11			15.44		15.03	
19	04.22	05.18-05.39/21	05.44	06.50-07.22/32	07.05	08.24			08.51	13.55-14.16/21	09.53	
	22.52		21.25		19.45	18.08			15.41		15.04	
20	04.24	05.18-05.38/20	05.46	06.49-07.21/32	07.07	08.27			08.54	13.56-14.14/18	09.54	
	22.50		21.22		19.41	18.05			15.39		15.04	
21	04.26	05.19-05.38/19	05.49	06.50-07.21/31	07.10	08.29			08.57	13.59-14.12/13	09.54	
	22.47		21.19		19.38	18.02			15.37		15.04	
22	04.29	05.20-05.39/19	05.52	06.50-07.20/30	07.13	08.32	15.00-15.11/11		08.59	14.03-14.08/5	09.55	
	22.45		21.16		19.35	17.59			15.35		15.04	
23	04.31	05.21-05.38/17	05.54	06.51-07.19/28	07.15	08.35	14.55-15.14/19		09.02		09.55	
	22.43		21.12		19.32	17.56			15.33		15.05	
24	04.34	05.22-05.37/15	05.57	06.51-07.18/27	07.18	08.38	14.53-15.16/23		09.05		09.56	
	22.40		21.09		19.28	17.53			15.31		15.06	
25	04.37	05.23-05.36/13	06.00	06.52-07.17/25	07.20	07.40	13.51-14.18/27		09.07		09.56	
	22.37		21.06		19.25	16.50			15.29		15.06	
26	04.39	05.25-05.34/9	06.02	06.53-07.15/22	07.23	07.43	13.49-14.19/30		09.10		09.56	
	22.35		21.03		19.22	16.47			15.27		15.07	
27	04.42	05.27-05.32/5	06.05	06.56-07.13/17	07.26	07.46	13.48-14.20/32		09.13		09.56	
	22.32		21.00		19.19	16.44			15.25		15.08	
28	04.44		06.08	06.58-07.09/11	07.28	07.49	13.46-14.20/34		09.15		09.56	
	22.30		20.56		19.15	16.41			15.23		15.09	
29	04.47		06.10		07.31	07.52	13.45-14.21/36		09.18		09.56	
	22.27		20.53		19.12	16.38			15.21		15.11	
30	04.50		06.13		07.33	07.55	13.46-14.22/36		09.20		09.56	
	22.24		20.50		19.09	16.35			15.19		15.12	
31	04.52		06.16			07.57	13.45-14.22/37				09.55	
	22.21		20.47			16.32					15.13	
Potential sun hours	579		495		390	311			215	690		0
Sum of minutes with flicker		514		650		0	285			690		0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 20 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 12.13-12.34/21 15.15	08.59 16.32	07.37 08.20-08.41/21 17.52	06.57 07.34-07.53/19 20.16	05.21 21.38	04.01 22.59
2	09.54 12.14-12.35/21 15.17	08.57 16.35	07.34 08.20-08.40/20 17.55	06.54 07.33-07.52/19 20.19	05.18 21.41	03.59 23.01
3	09.53 12.15-12.35/20 15.18	08.54 16.38	07.31 08.20-08.39/19 17.58	06.50 07.33-07.51/18 20.21	05.15 21.44	03.57 23.03
4	09.52 12.15-12.35/20 15.20	08.51 16.40	07.28 08.21-08.39/18 18.01	06.47 07.33-07.51/18 20.24	05.12 21.46	03.55 23.05
5	09.51 12.16-12.36/20 15.22	08.48 16.43	07.24 08.21-08.37/16 18.03	06.44 07.34-07.49/15 20.27	05.09 21.49	03.54 22.01-22.06/5 23.07
6	09.50 12.17-12.36/19 15.24	08.46 16.46	07.21 08.22-08.36/14 18.06	06.40 07.35-07.48/13 20.30	05.06 21.52	03.52 21.59-22.08/9 23.09
7	09.49 12.17-12.36/19 15.26	08.43 16.49	07.18 08.25-08.33/8 18.09	06.37 07.37-07.44/7 20.32	05.03 21.55	03.51 21.58-22.09/11 23.11
8	09.48 12.17-12.36/19 15.28	08.40 16.52	07.15 18.12	06.34 20.35	05.00 21.58	03.50 21.57-22.10/13 23.12
9	09.47 12.18-12.36/18 15.30	08.37 16.55	07.12 18.14	06.31 20.38	04.58 22.00	03.48 21.57-22.11/14 23.14
10	09.45 12.20-12.37/17 15.33	08.34 16.58	07.08 18.17	06.28 20.40	04.55 22.03	03.47 21.56-22.12/16 23.15
11	09.44 12.20-12.36/16 15.35	08.32 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 21.55-22.12/17 23.17
12	09.42 12.21-12.36/15 15.37	08.29 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 21.56-22.13/17 23.18
13	09.41 12.22-12.36/14 15.40	08.26 17.07	06.59 18.25	06.18 20.48	04.46 22.11	03.44 21.55-22.13/18 23.19
14	09.39 12.24-12.35/11 15.42	08.23 17.10	06.55 18.28	06.15 20.51	04.44 22.14	03.43 21.55-22.14/19 23.20
15	09.37 12.25-12.34/9 15.45	08.20 17.13	06.52 18.31	06.11 20.54	04.41 22.17	03.43 21.56-22.15/19 23.21
16	09.36 12.29-12.31/2 15.47	08.17 17.15	06.49 18.33	06.08 20.57	04.38 22.20	03.42 21.55-22.15/20 23.22
17	09.34 15.50	08.14 17.18	06.46 18.36	06.05 20.59	04.35 22.22	03.42 21.55-22.15/20 23.23
18	09.32 15.52	08.11 17.21	06.42 18.39	06.02 21.02	04.33 22.25	03.41 21.55-22.16/21 23.24
19	09.30 15.55	08.08 17.24	06.39 18.41	05.59 21.05	04.30 22.28	03.41 21.56-22.16/20 23.24
20	09.28 15.58	08.05 17.27	06.36 18.44	05.55 21.08	04.28 22.30	03.41 21.56-22.16/20 23.25
21	09.26 16.00	08.02 17.30	06.33 18.47	05.52 21.10	04.25 22.33	03.41 21.56-22.17/21 23.25
22	09.23 16.03	07.59 17.33	06.29 18.49	05.49 21.13	04.23 22.35	03.41 21.57-22.17/20 23.25
23	09.21 16.06	07.56 08.28-08.35/7 17.35	06.26 18.52	05.46 21.16	04.20 22.38	03.42 21.57-22.17/20 23.25
24	09.19 16.09	07.53 08.25-08.38/13 17.38	06.23 18.55	05.43 21.19	04.18 22.40	03.42 21.56-22.17/21 23.25
25	09.17 16.12	07.50 08.23-08.39/16 17.41	06.20 18.57	05.40 21.21	04.16 22.43	03.42 21.57-22.18/21 23.25
26	09.14 16.14	07.46 08.22-08.40/18 17.44	06.16 19.00	05.37 21.24	04.13 22.45	03.43 21.57-22.17/20 23.25
27	09.12 16.17	07.43 08.20-08.40/20 17.47	06.13 06.43-06.50/7 19.03	05.34 21.27	04.11 22.48	03.44 21.58-22.18/20 23.24
28	09.09 16.20	07.40 08.20-08.40/20 17.50	06.10 06.39-06.51/12 19.05	05.30 21.30	04.09 22.50	03.44 21.59-22.18/19 23.24
29	09.07 16.23		07.07 07.36-07.52/16 20.08	05.27 21.32	04.07 22.52	03.45 21.59-22.18/19 23.23
30	09.04 16.26		07.03 07.34-07.52/18 20.11	05.24 21.35	04.05 22.55	03.46 21.59-22.17/18 23.23
31	09.02 16.29		07.00 07.34-07.53/19 20.13		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	261	94	188	109	0	458

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 20 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (731)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December		
1	03.48 21.59-22.17/18	04.55	06.18	07.36	08.00	09.22	12.02-12.18/16	
	23.22	22.19	20.43	19.06	16.29	15.18		
2	03.49 22.00-22.16/16	04.58	06.21	07.38	08.03	09.25	12.02-12.19/17	
	23.21	22.16	20.40	19.02	16.26	15.16		
3	03.50 22.02-22.17/15	05.00	06.23	07.41	08.06	09.27	12.02-12.20/18	
	23.20	22.13	20.37	18.59	16.23	15.15		
4	03.52 22.02-22.16/14	05.03	06.26	07.44	08.09	09.29	12.02-12.20/18	
	23.19	22.10	20.34	18.56	16.21	15.13		
5	03.53 22.03-22.15/12	05.06	06.29 07.34-07.41/7	07.46	08.12	09.31	12.02-12.21/19	
	23.18	22.07	20.30	18.53	16.18	15.12		
6	03.55 22.04-22.14/10	05.09	06.31 07.31-07.43/12	07.49 09.03-09.05/2	08.14	09.33	12.02-12.22/20	
	23.16	22.04	20.27	18.49	16.15	15.11		
7	03.56 22.06-22.13/7	05.11	06.34 07.29-07.45/16	07.52 08.59-09.10/11	08.17	09.35	12.03-12.22/19	
	23.15	22.01	20.24	18.46	16.12	15.10		
8	03.58	05.14	06.36 07.28-07.45/17	07.54 08.57-09.12/15	08.20	09.37	12.03-12.23/20	
	23.13	21.58	20.21	18.43	16.09	15.09		
9	04.00	05.17	06.39 07.27-07.46/19	07.57 08.56-09.13/17	08.23	09.39	12.04-12.24/20	
	23.12	21.55	20.17	18.40	16.07	15.08		
10	04.02	05.19	06.42 07.26-07.45/19	08.00 08.55-09.14/19	08.26	09.41	12.04-12.24/20	
	23.10	21.52	20.14	18.37	16.04	15.07		
11	04.04	05.22	06.44 07.26-07.45/19	08.02 08.53-09.13/20	08.29	09.43	12.04-12.24/20	
	23.08	21.49	20.11	18.33	16.01	15.06		
12	04.06	05.25	06.47 07.25-07.44/19	08.05 08.53-09.13/20	08.31	09.44	12.05-12.25/20	
	23.06	21.46	20.08	18.30	15.59	15.05		
13	04.08	05.28	06.49 07.26-07.44/18	08.08 08.53-09.13/20	08.34	09.46	12.05-12.26/21	
	23.05	21.43	20.04	18.27	15.56	15.05		
14	04.10	05.30	06.52 07.26-07.42/16	08.10 08.53-09.13/20	08.37	09.47	12.06-12.26/20	
	23.03	21.40	20.01	18.24	15.54	15.04		
15	04.12	05.33	06.55 07.29-07.41/12	08.13 08.53-09.12/19	08.40	09.48	12.06-12.27/21	
	23.01	21.37	19.58	18.21	15.51	15.04		
16	04.15	05.36	06.57 07.31-07.39/8	08.16 08.54-09.12/18	08.43	09.50	12.06-12.26/20	
	22.59	21.34	19.55	18.18	15.49	15.04		
17	04.17	05.38	07.00 07.34-07.35/1	08.18 08.55-09.10/15	08.46	09.51	12.07-12.27/20	
	22.56	21.31	19.51	18.14	15.46	15.04		
18	04.19	05.41	07.02	08.21 08.58-09.09/11	08.48	09.52	12.07-12.28/21	
	22.54	21.28	19.48	18.11	15.44	15.03		
19	04.22	05.44	07.05	08.24 09.01-09.06/5	08.51	09.53	12.07-12.28/21	
	22.52	21.25	19.45	18.08	15.42	15.04		
20	04.24	05.46	07.07	08.27	08.54	09.53	12.08-12.29/21	
	22.50	21.22	19.41	18.05	15.39	15.04		
21	04.27	05.49	07.10	08.29	08.57	09.54	12.09-12.29/20	
	22.47	21.19	19.38	18.02	15.37	15.04		
22	04.29	05.52	07.13	08.32	08.59	09.55	12.09-12.29/20	
	22.45	21.15	19.35	17.59	15.35	15.05		
23	04.32	05.54	07.15	08.35	09.02	09.55	12.10-12.30/20	
	22.42	21.12	19.32	17.56	15.33	15.05		
24	04.34	05.57	07.18	08.38	09.05	09.56	12.10-12.31/21	
	22.40	21.09	19.28	17.53	15.31	15.06		
25	04.37	06.00	07.20	07.40	09.07	09.56	12.11-12.31/20	
	22.37	21.06	19.25	16.50	15.29	15.06		
26	04.39	06.02	07.23	07.43	09.10 12.08-12.09/1	09.56	12.11-12.31/20	
	22.35	21.03	19.22	16.47	15.27	15.07		
27	04.42	06.05	07.25	07.46	09.12 12.05-12.13/8	09.56	12.12-12.32/20	
	22.32	21.00	19.19	16.44	15.25	15.08		
28	04.44	06.08	07.28	07.49	09.15 12.03-12.15/12	09.56	12.12-12.32/20	
	22.30	20.56	19.15	16.41	15.23	15.09		
29	04.47	06.10	07.31	07.52	09.17 12.03-12.17/14	09.56	12.12-12.32/20	
	22.27	20.53	19.12	16.38	15.21	15.11		
30	04.50	06.13	07.33	07.54	09.20 12.03-12.18/15	09.56	12.13-12.33/20	
	22.24	20.50	19.09	16.35	15.19	15.12		
31	04.52	06.16		07.57		09.55	12.13-12.34/21	
	22.21	20.47		16.32		15.13		
Potential sun hours	578	495	390	311	215	166		
Sum of minutes with flicker	92	0	183	212	50	614		

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-Last time (hh:mm) with flicker/Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 21 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June
1	09.55 15.15	08.59 10.55-11.14/19 16.32 10.16-10.46/30	07.37 17.52	06.57 08.17-08.52/35 20.16	05.21 21.38	04.01 22.59
2	09.54 15.17	08.57 10.56-11.13/17 16.35 10.16-10.47/31	07.34 17.55	06.54 08.17-08.50/33 20.19	05.18 21.41	03.59 23.01
3	09.53 15.19	08.54 10.57-11.10/13 16.38 10.15-10.46/31	07.31 17.58	06.50 08.18-08.49/31 20.22	05.15 21.44	03.57 23.03
4	09.52 15.20	08.51 11.01-11.07/6 16.41 10.16-10.47/31	07.28 18.01	06.47 08.19-08.48/29 20.24	05.12 21.46	03.56 23.05
5	09.51 15.22	08.49 10.16-10.47/31 16.44	07.24 18.03	06.44 08.20-08.46/26 20.27	05.09 21.49	03.54 23.07
6	09.50 15.24	08.46 10.17-10.47/30 16.46	07.21 18.06	06.41 08.21-08.44/23 20.30	05.06 21.52	03.52 23.09
7	09.49 10.53-10.59/6 15.26	08.43 10.17-10.47/30 16.49	07.18 18.09	06.37 08.22-08.40/18 20.32	05.03 21.55	03.51 23.11
8	09.48 10.52-11.02/10 15.28	08.40 10.17-10.46/29 16.52	07.15 18.12	06.34 08.25-08.37/12 20.35	05.01 21.58	03.50 23.12
9	09.47 10.51-11.04/13 15.30	08.37 10.18-10.46/28 16.55	07.12 18.14	06.31 20.38	04.58 22.00	03.48 23.14
10	09.45 10.51-11.05/14 15.33	08.35 10.19-10.45/26 16.58	07.08 18.17	06.28 20.40	04.55 22.03	03.47 23.15
11	09.44 10.49-11.06/17 15.35	08.32 10.20-10.45/25 17.01	07.05 18.20	06.24 20.43	04.52 22.06	03.46 23.17
12	09.43 10.49-11.08/19 15.37	08.29 10.21-10.44/23 17.04	07.02 18.23	06.21 20.46	04.49 22.09	03.45 23.18
13	09.41 10.49-11.08/19 15.40	08.26 10.22-10.41/19 17.07	06.59 18.25	06.18 20.49	04.46 22.11	03.44 23.19
14	09.39 10.49-11.10/21 15.42	08.23 10.24-10.39/15 17.10	06.55 18.28	06.15 20.51	04.44 22.14	03.43 23.20
15	09.37 10.48-11.11/23 15.45	08.20 10.28-10.36/8 17.13	06.52 18.31	06.12 20.54	04.41 22.17	03.43 23.21
16	09.36 10.48-11.11/23 15.47	08.17 17.16	06.49 07.39-07.41/2 18.33	06.08 20.57	04.38 22.20	03.42 23.22
17	09.34 10.49-11.13/24 15.50	08.14 17.18	06.46 07.32-07.47/15 18.36	06.05 20.59	04.36 22.22	03.42 23.23
18	09.32 10.48-11.13/25 15.52	08.11 17.21	06.43 07.28-07.49/21 18.39	06.02 21.02	04.33 22.25	03.42 23.24
19	09.30 10.48-11.14/26 15.55	08.08 17.24	06.39 07.26-07.51/25 18.41	05.59 21.05	04.30 22.28	03.41 23.24
20	09.28 10.48-11.14/26 15.58	08.05 17.27	06.36 07.24-07.52/28 18.44	05.56 21.08	04.28 22.30	03.41 23.25
21	09.26 10.48-11.14/26 16.00	08.02 17.30	06.33 07.22-07.52/30 18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 10.48-11.15/27 16.03 10.23-10.34/11	07.59 17.33	06.29 07.21-07.53/32 18.50	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 10.48-11.15/27 16.06 10.21-10.36/15	07.56 17.36	06.26 07.20-07.54/34 18.52	05.46 21.16	04.20 22.38	03.42 23.25
24	09.19 10.49-11.15/26 16.09 10.20-10.38/18	07.53 17.38	06.23 07.20-07.55/35 18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 10.49-11.16/27 16.12 10.19-10.40/21	07.50 17.41	06.20 07.18-07.54/36 18.58	05.40 21.21	04.16 22.43	03.42 23.25
26	09.14 10.49-11.16/27 16.14 10.18-10.41/23	07.46 17.44	06.16 07.18-07.54/36 19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 10.50-11.16/26 16.17 10.17-10.42/25	07.43 17.47	06.13 07.17-07.55/38 19.03	05.34 21.27	04.11 22.48	03.44 23.25
28	09.09 10.51-11.16/25 16.20 10.17-10.43/26	07.40 17.50	06.10 07.16-07.53/37 19.06	05.31 21.30	04.09 22.50	03.45 23.24
29	09.07 10.51-11.16/25 16.23 10.16-10.44/28		07.07 08.16-08.53/37 20.08	05.27 21.33	04.07 22.52	03.46 23.23
30	09.04 10.52-11.15/23 16.26 10.16-10.45/29		07.03 08.17-08.53/36 20.11	05.24 21.35	04.05 22.55	03.47 23.23
31	09.02 10.53-11.15/22 16.29 10.16-10.45/29		07.00 08.17-08.52/35 20.14		04.03 22.57	
Potential sun hours	194	247	364	443	547	586
Sum of minutes with flicker	772	442	477	207	0	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130WTG: 21 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (732)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48 23.22	04.55 22.19	06.18 20.44	07.36 19.06	08.00 09.48-10.15/27 16.29	09.22 10.32-10.48/16 15.18
2	03.49 23.21	04.58 22.16	06.21 20.40	07.39 19.02	08.03 09.47-10.15/28 16.26	09.25 10.33-10.48/15 15.16
3	03.50 23.20	05.01 22.13	06.24 20.37	07.41 18.59	08.06 09.47-10.16/29 16.23	09.27 10.34-10.47/13 15.15
4	03.52 23.19	05.03 22.10	06.26 08.22-08.34/12 20.34	07.44 18.56	08.09 09.47-10.17/30 16.21	09.29 10.36-10.46/10 15.13
5	03.53 23.18	05.06 22.07	06.29 08.19-08.37/18 20.31	07.46 18.53	08.12 09.46-10.17/31 16.18	09.31 10.38-10.45/7 15.12
6	03.55 23.16	05.09 22.04	06.31 08.16-08.39/23 20.27	07.49 18.49	08.14 09.46-10.16/30 16.15	09.33 15.11
7	03.56 23.15	05.11 22.01	06.34 08.15-08.41/26 20.24	07.52 18.46	08.17 10.31-10.38/7 16.12 09.46-10.17/31	09.35 15.10
8	03.58 23.13	05.14 21.59	06.37 08.13-08.42/29 20.21	07.54 18.43	08.20 10.28-10.41/13 16.09 09.46-10.17/31	09.37 15.09
9	04.00 23.12	05.17 21.56	06.39 08.12-08.43/31 20.18	07.57 18.40	08.23 10.27-10.44/17 16.07 09.47-10.17/30	09.39 15.08
10	04.02 23.10	05.20 21.53	06.42 08.10-08.43/33 20.14	08.00 18.37	08.26 10.25-10.45/20 16.04 09.47-10.17/30	09.41 15.07
11	04.04 23.08	05.22 21.50	06.44 08.10-08.44/34 20.11	08.02 18.33	08.29 10.24-10.46/22 16.01 09.47-10.16/29	09.43 15.06
12	04.06 23.07	05.25 21.47	06.47 08.08-08.44/36 20.08	08.05 18.30	08.32 10.24-10.47/23 15.59 09.48-10.17/29	09.44 15.05
13	04.08 23.05	05.28 21.43	06.49 08.08-08.44/36 20.04	08.08 18.27	08.34 10.23-10.47/24 15.56 09.48-10.16/28	09.46 15.05
14	04.10 23.03	05.30 21.40	06.52 08.07-08.44/37 20.01	08.10 18.24	08.37 10.23-10.49/26 15.54 09.50-10.16/26	09.47 15.04
15	04.12 23.01	05.33 21.37	06.55 08.07-08.44/37 19.58	08.13 18.21	08.40 10.23-10.49/26 15.51 09.50-10.15/25	09.48 15.04
16	04.15 22.59	05.36 21.34	06.57 08.06-08.43/37 19.55	08.16 18.18	08.43 10.22-10.49/27 15.49 09.51-10.14/23	09.50 15.04
17	04.17 22.56	05.38 21.31	07.00 08.06-08.43/37 19.51	08.18 18.15	08.46 10.23-10.50/27 15.46 09.53-10.13/20	09.51 15.04
18	04.19 22.54	05.41 21.28	07.02 08.06-08.42/36 19.48	08.21 18.11	08.48 10.23-10.49/26 15.44 09.54-10.12/18	09.52 15.04
19	04.22 22.52	05.44 21.25	07.05 08.06-08.42/36 19.45	08.24 18.08	08.51 10.23-10.50/27 15.42 09.56-10.11/15	09.53 15.04
20	04.24 22.50	05.47 21.22	07.07 08.06-08.40/34 19.42	08.27 18.05	08.54 10.23-10.50/27 15.39 09.58-10.09/11	09.54 15.04
21	04.27 22.47	05.49 21.19	07.10 08.07-08.39/32 19.38	08.29 18.02	08.57 10.24-10.50/26 15.37 10.04-10.05/1	09.54 15.04
22	04.29 22.45	05.52 21.16	07.13 08.07-08.38/31 19.35	08.32 17.59	08.59 10.24-10.50/26 15.35	09.55 15.05
23	04.32 22.42	05.55 21.12	07.15 08.08-08.36/28 19.32	08.35 17.56	09.02 10.25-10.51/26 15.33	09.55 15.05
24	04.34 22.40	05.57 21.09	07.18 08.09-08.35/26 19.28	08.38 17.53	09.05 10.25-10.50/25 15.31	09.56 15.06
25	04.37 22.37	06.00 21.06	07.20 08.10-08.32/22 19.25	07.40 16.50	09.07 10.26-10.50/24 15.29	09.56 15.07
26	04.39 22.35	06.03 21.03	07.23 08.13-08.30/17 19.22	07.43 16.47	09.10 10.27-10.50/23 15.27	09.56 15.07
27	04.42 22.32	06.05 21.00	07.26 08.16-08.25/9 19.19	07.46 09.56-10.06/10 16.44	09.12 10.28-10.50/22 15.25	09.56 15.08
28	04.45 22.30	06.08 20.56	07.28 08.09-08.35/26 19.15	07.49 09.53-10.09/16 16.41	09.15 10.28-10.49/21 15.23	09.56 15.10
29	04.47 22.27	06.10 20.53	07.31 08.09-08.35/26 19.12	07.52 09.51-10.11/20 16.38	09.17 10.30-10.50/20 15.21	09.56 15.11
30	04.50 22.24	06.13 20.50	07.33 08.09-08.35/26 19.09	07.55 09.50-10.13/23 16.35	09.20 10.31-10.49/18 15.19	09.56 15.12
31	04.52 22.21	06.16 20.47	07.36 08.09-08.35/26 19.06	07.57 09.49-10.14/25 16.32	09.23 10.32-10.49/17 15.17	09.56 15.13
Potential sun hours	578	495	390	311	215	167
Sum of minutes with flicker	0	0	697	94	1065	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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 22 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	
1	09.54 15.15	08.59 16.32	07.37 17.52	08.31-08.49/18 17.52	06.57 20.16	19.14-19.35/21 05.21	04.01 22.59
2	09.54 15.17	08.57 16.35	07.34 17.55	08.31-08.47/16 17.55	06.54 20.19	19.13-19.36/23 05.18	03.59 23.01
3	09.53 15.19	08.54 16.38	07.31 17.58	08.32-08.46/14 17.58	06.50 20.22	19.12-19.37/25 05.15	03.57 23.03
4	09.52 15.20	08.51 16.41	07.28 18.01	08.34-08.44/10 18.01	06.47 20.24	19.11-19.38/27 05.12	03.56 23.05
5	09.51 15.22	08.48 16.43	07.24 18.03	18.03	06.44 20.27	19.09-19.37/28 05.09	03.54 23.07
6	09.50 15.24	08.46 16.46	07.21 18.06	18.06	06.41 20.30	19.09-19.37/28 05.06	03.52 23.09
7	09.49 15.26	08.43 16.49	07.18 18.09	18.09	06.37 20.32	19.09-19.37/28 05.03	03.51 23.11
8	09.48 15.28	08.40 16.52	07.15 18.12	18.12	06.34 20.35	19.09-19.37/28 05.01	03.50 23.12
9	09.47 15.30	08.37 16.55	07.12 18.14	18.14	06.31 20.38	19.09-19.37/28 04.58	03.48 23.14
10	09.45 15.33	08.34 16.58	07.08 18.17	18.17	06.28 20.40	19.09-19.36/27 04.55	03.47 23.15
11	09.44 15.35	08.32 17.01	07.05 18.20	18.20	06.24 20.43	19.09-19.35/26 04.52	03.46 23.17
12	09.42 15.37	08.29 17.04	07.02 18.23	18.23	06.21 20.46	19.09-19.33/24 04.49	03.45 23.18
13	09.41 15.40	08.26 17.07	06.59 18.25	18.25	06.18 20.48	19.10-19.32/22 04.46	03.44 23.19
14	09.39 15.42	08.23 17.10	06.55 18.28	18.28	06.15 20.51	19.11-19.31/20 04.44	03.44 23.20
15	09.37 15.45	08.20 17.13	06.52 18.31	18.31	06.11 20.54	19.13-19.29/16 04.41	03.43 23.21
16	09.36 15.47	08.17 17.16	06.49 18.33	18.33	06.08 20.57	19.15-19.26/11 04.38	03.42 23.22
17	09.34 15.50	08.14 17.18	06.46 18.36	18.36	06.05 20.59	04.36 22.22	03.42 23.23
18	09.32 15.52	08.11 17.21	06.42 18.39	18.39	06.02 21.02	04.33 22.25	03.42 23.24
19	09.30 15.55	08.08 17.24	06.39 18.41	18.41	05.59 21.05	04.30 22.27	03.41 23.24
20	09.28 15.58	08.05 17.27	08.38-08.45/7 06.36	18.44	05.56 21.08	04.28 22.30	03.41 23.25
21	09.26 16.00	08.02 17.30	08.35-08.47/12 06.33	18.47	05.52 21.10	04.25 22.33	03.41 23.25
22	09.23 16.03	07.59 17.33	08.33-08.49/16 06.29	18.49	05.49 21.13	04.23 22.35	03.41 23.25
23	09.21 16.06	07.56 17.36	08.31-08.49/18 06.26	18.52	05.46 21.16	04.20 22.38	03.42 23.25
24	09.19 16.09	07.53 17.38	08.30-08.50/20 06.23	18.55	05.43 21.19	04.18 22.40	03.42 23.25
25	09.17 16.12	07.50 17.41	08.30-08.50/20 06.20	18.57	05.40 21.21	04.16 22.43	03.43 23.25
26	09.14 16.14	07.46 17.44	08.30-08.51/21 06.16	19.00	05.37 21.24	04.13 22.45	03.43 23.25
27	09.12 16.17	07.43 17.47	08.30-08.50/20 06.13	19.03	05.34 21.27	04.11 22.48	03.44 23.24
28	09.09 16.20	07.40 17.50	08.30-08.50/20 06.10	19.05	05.31 21.30	04.09 22.50	03.45 23.24
29	09.07 16.23	07.37 17.53	19.23-19.28/5 07.07	19.07	05.27 21.32	04.07 22.52	03.46 23.23
30	09.04 16.26	07.34 17.56	19.19-19.32/13 07.03	19.19	05.24 21.35	04.05 22.55	03.47 23.23
31	09.02 16.29	07.31 17.59	19.17-19.35/18 07.00	19.17	05.21 21.38	04.03 22.57	03.48 23.23
Potential sun hours	194	247	364	443	547	586	
Sum of minutes with flicker	0	154	94	382	0	0	

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 22 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (733)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	July	August	September	October	November	December
1	03.48	04.55	06.18 19.08-19.34/26	07.36	08.00	09.22
	23.22	22.19	20.43	19.06	16.29	15.18
2	03.49	04.58	06.21 19.07-19.34/27	07.38	08.03	09.24
	23.21	22.16	20.40	19.02	16.26	15.16
3	03.50	05.01	06.24 19.07-19.35/28	07.41	08.06	09.27
	23.20	22.13	20.37	18.59	16.23	15.15
4	03.52	05.03	06.26 19.06-19.34/28	07.44	08.09	09.29
	23.19	22.10	20.34	18.56	16.21	15.13
5	03.53	05.06	06.29 19.06-19.34/28	07.46	08.11	09.31
	23.17	22.07	20.30	18.53	16.18	15.12
6	03.55	05.09	06.31 19.05-19.33/28	07.49	08.14	09.33
	23.16	22.04	20.27	18.49	16.15	15.11
7	03.57	05.11	06.34 19.05-19.33/28	07.52	08.17	09.35
	23.15	22.01	20.24	18.46	16.12	15.10
8	03.58	05.14	06.37 19.05-19.32/27	07.54	08.20	09.37
	23.13	21.58	20.21	18.43	16.09	15.09
9	04.00	05.17	06.39 19.05-19.31/26	07.57 09.11-09.16/5	08.23	09.39
	23.12	21.55	20.17	18.40	16.07	15.08
10	04.02	05.20	06.42 19.06-19.30/24	08.00 09.08-09.20/12	08.26	09.41
	23.10	21.52	20.14	18.37	16.04	15.07
11	04.04	05.22	06.44 19.06-19.28/22	08.02 09.05-09.20/15	08.29	09.42
	23.08	21.49	20.11	18.33	16.01	15.06
12	04.06	05.25	06.47 19.08-19.26/18	08.05 09.04-09.22/18	08.31	09.44
	23.06	21.46	20.08	18.30	15.59	15.05
13	04.08	05.28	06.49 19.09-19.23/14	08.08 09.03-09.22/19	08.34	09.46
	23.05	21.43	20.04	18.27	15.56	15.05
14	04.10	05.30	06.52 19.13-19.20/7	08.10 09.03-09.23/20	08.37	09.47
	23.03	21.40	20.01	18.24	15.54	15.04
15	04.12	05.33	06.55	08.13 09.02-09.23/21	08.40	09.48
	23.01	21.37	19.58	18.21	15.51	15.04
16	04.15	05.36	06.57	08.16 09.02-09.23/21	08.43	09.50
	22.58	21.34	19.55	18.18	15.49	15.04
17	04.17	05.38	07.00	08.18 09.02-09.22/20	08.46	09.51
	22.56	21.31	19.51	18.14	15.46	15.04
18	04.19	05.41	07.02	08.21 09.02-09.22/20	08.48	09.52
	22.54	21.28	19.48	18.11	15.44	15.04
19	04.22	05.44	07.05	08.24 09.03-09.21/18	08.51	09.53
	22.52	21.25	19.45	18.08	15.42	15.04
20	04.24	05.46	07.07	08.27 09.04-09.20/16	08.54	09.53
	22.50	21.22	19.41	18.05	15.39	15.04
21	04.27	05.49	07.10	08.29 09.07-09.18/11	08.57	09.54
	22.47	21.19	19.38	18.02	15.37	15.04
22	04.29	05.52	07.13	08.32 09.10-09.15/5	08.59	09.55
	22.45	21.15	19.35	17.59	15.35	15.05
23	04.32	05.55	07.15	08.35	09.02	09.55
	22.42	21.12	19.32	17.56	15.33	15.05
24	04.34	05.57	07.18	08.38	09.05	09.56
	22.40	21.09	19.28	17.53	15.31	15.06
25	04.37	06.00	07.20	07.40	09.07	09.56
	22.37	21.06	19.25	16.50	15.29	15.07
26	04.39	06.02	07.23	07.43	09.10	09.56
	22.35	21.03	19.22	16.47	15.27	15.07
27	04.42	06.05 19.17-19.28/11	07.25	07.46	09.12	09.56
	22.32	21.00	19.19	16.44	15.25	15.08
28	04.45	06.08 19.14-19.31/17	07.28	07.49	09.15	09.56
	22.29	20.56	19.15	16.41	15.23	15.10
29	04.47	06.10 19.12-19.32/20	07.31	07.52	09.17	09.56
	22.27	20.53	19.12	16.38	15.21	15.11
30	04.50	06.13 19.11-19.33/22	07.33	07.54	09.20	09.55
	22.24	20.50	19.09	16.35	15.19	15.12
31	04.52	06.16 19.09-19.33/24		07.57		09.55
	22.21	20.47		16.32		15.13
Potential sun hours	578	495	390	311	215	167
Sum of minutes with flicker	0	94	331	221	0	0

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	Last time (hh:mm) with flicker	Minutes with flicker
	Sun set (hh:mm)	First time (hh:mm) with flicker	Last time (hh:mm) with flicker	Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130**WTG:** 23 - VESTAS V162-6.0 HH169 6000 162.0 !O! hub: 169,0 m (TOT: 250,0 m) (734)
 Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
 1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
 564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37 09.40-09.52/12	06.57	05.21	04.01	03.47	04.55	06.18	07.36	08.00 09.04-09.30/26	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.05	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03 09.05-09.29/24	09.25
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06 09.07-09.28/21	09.27
	15.18	16.37	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.51	05.03	06.26	07.44	08.09 09.09-09.26/17	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.52	08.49	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.12 09.12-09.23/11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.18	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46 09.42-09.54/12	07.21	06.40	05.06	03.52	03.55	05.08	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43 09.39-09.57/18	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.09
8	09.48	08.40 09.36-09.58/22	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.58	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37 09.35-10.00/25	07.12	06.31	04.57	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.07
10	09.46	08.35 09.34-10.01/27	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.32	16.58	18.17	20.40	22.03	23.16	23.10	21.53	20.14	18.36	16.04	15.07
11	09.44	08.32 09.33-10.02/29	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.43
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.43	08.29 09.32-10.03/31	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05 10.16-10.22/6	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.07	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26 09.31-10.03/32	06.59	06.18	04.46	03.44	04.08	05.27	06.49	08.08 10.11-10.27/16	08.34	09.46
	15.39	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23 09.31-10.04/33	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10 10.09-10.29/20	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.21	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20 09.31-10.05/34	06.52	06.11	04.41	03.42	04.12	05.33	06.54	08.13 10.07-10.31/24	08.40	09.48
	15.44	17.12	18.31	20.54	22.17	23.22	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17 09.30-10.05/35	06.49	06.08	04.38	03.42	04.14	05.36	06.57	08.16 10.05-10.33/28	08.43	09.50
	15.47	17.15	18.33	20.57	22.20	23.22	22.59	21.34	19.54	18.17	15.49	15.03
17	09.34	08.14 09.30-10.05/35	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18 10.04-10.34/30	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11 09.30-10.05/35	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21 10.03-10.34/31	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08 09.30-10.06/36	06.39	05.59	04.30	03.41	04.21	05.44	07.05	08.24 10.02-10.35/33	08.51	09.53
	15.55	17.24	18.41	21.05	22.28	23.24	22.52	21.25	19.45	18.08	15.41	15.03
20	09.28	08.05 09.30-10.05/35	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27 10.02-10.35/33	08.54	09.54
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02 09.30-10.04/34	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29 10.01-10.36/35	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59 09.31-10.04/33	06.29	05.49	04.23	03.41	04.29	05.52	07.12	08.32 10.01-10.36/35	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56 09.31-10.03/32	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35 10.00-10.36/36	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53 09.32-10.02/30	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38 10.00-10.35/35	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.30	15.06
25	09.17	07.49 09.33-10.01/28	06.20	05.40	04.15	03.42	04.36	06.00	07.20	07.40 09.00-09.35/35	09.07	09.56
	16.11	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.28	15.06
26	09.14	07.46 09.33-09.59/26	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43 09.00-09.35/35	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.26	15.07
27	09.12	07.43 09.35-09.58/23	06.13	05.33	04.11	03.43	04.42	06.05	07.25	07.46 09.00-09.34/34	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.25	22.32	21.00	19.19	16.44	15.25	15.08
28	09.09	07.40 09.37-09.56/19	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49 09.00-09.33/33	09.15	09.56
	16.20	17.49	19.05	21.30	22.50	23.24	22.30	20.56	19.15	16.41	15.23	15.09
29	09.07		06.06	05.27	04.07	03.45	04.47	06.10	07.31	07.52 09.01-09.33/32	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.10
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54 09.02-09.33/31	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57 09.03-09.32/29		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	579	495	390	311	215	166
Sum of minutes with flicker	0	664	12	0	0	0	0	0	0	591	99	0

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-Last time (hh:mm) with flicker/Minutes with flicker
 Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

SHADOW - Calendar per WTG

Calculation: Paholammi_VE2_Shadow_Forest_20211130 **WTG:** 24 - VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m) (735)

Assumptions for shadow calculations

Sunshine probability S (Average daily sunshine hours) []

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
1,00 2,82 4,23 6,60 8,77 9,10 8,87 6,80 4,67 2,52 1,17 0,58

Operational time

N NNE ENE E ESE SSE S SSW WSW W WNW NNW Sum
564 465 410 443 549 706 909 1 065 823 683 592 542 7 751

	January	February	March	April	May	June	July	August	September	October	November	December
1	09.55	08.59	07.37	06.57	05.21	04.01	03.48	04.55	06.18	07.36	08.00	09.22
	15.15	16.32	17.52	20.16	21.38	22.59	23.22	22.19	20.43	19.06	16.29	15.18
2	09.54	08.57	07.34	06.53	05.18	03.59	03.49	04.58	06.21	07.38	08.03	09.24
	15.17	16.35	17.55	20.19	21.41	23.01	23.21	22.16	20.40	19.02	16.26	15.16
3	09.53	08.54	07.31	06.50	05.15	03.57	03.50	05.00	06.23	07.41	08.06	09.27
	15.18	16.38	17.58	20.21	21.44	23.03	23.20	22.13	20.37	18.59	16.23	15.15
4	09.52	08.51	07.27	06.47	05.12	03.55	03.52	05.03	06.26	07.44	08.09	09.29
	15.20	16.40	18.01	20.24	21.46	23.05	23.19	22.10	20.34	18.56	16.20	15.13
5	09.51	08.48	07.24	06.44	05.09	03.54	03.53	05.06	06.29	07.46	08.11	09.31
	15.22	16.43	18.03	20.27	21.49	23.07	23.17	22.07	20.30	18.53	16.18	15.12
6	09.50	08.46	07.21	06.40	05.06	03.52	03.55	05.09	06.31	07.49	08.14	09.33
	15.24	16.46	18.06	20.30	21.52	23.09	23.16	22.04	20.27	18.49	16.15	15.11
7	09.49	08.43	07.18	06.37	05.03	03.51	03.56	05.11	06.34	07.52	08.17	09.35
	15.26	16.49	18.09	20.32	21.55	23.11	23.15	22.01	20.24	18.46	16.12	15.10
8	09.48	08.40	07.15	06.34	05.00	03.49	03.58	05.14	06.36	07.54	08.20	09.37
	15.28	16.52	18.12	20.35	21.57	23.12	23.13	21.58	20.21	18.43	16.09	15.08
9	09.47	08.37	07.11	06.31	04.58	03.48	04.00	05.17	06.39	07.57	08.23	09.39
	15.30	16.55	18.14	20.38	22.00	23.14	23.12	21.55	20.17	18.40	16.07	15.08
10	09.45	08.34	07.08	06.27	04.55	03.47	04.02	05.19	06.42	08.00	08.26	09.41
	15.33	16.58	18.17	20.40	22.03	23.15	23.10	21.52	20.14	18.37	16.04	15.07
11	09.44	08.32	07.05	06.24	04.52	03.46	04.04	05.22	06.44	08.02	08.29	09.42
	15.35	17.01	18.20	20.43	22.06	23.17	23.08	21.49	20.11	18.33	16.01	15.06
12	09.42	08.29	07.02	06.21	04.49	03.45	04.06	05.25	06.47	08.05	08.31	09.44
	15.37	17.04	18.22	20.46	22.09	23.18	23.06	21.46	20.08	18.30	15.59	15.05
13	09.41	08.26	06.59	06.18	04.46	03.44	04.08	05.28	06.49	08.08	08.34	09.46
	15.40	17.07	18.25	20.48	22.11	23.19	23.05	21.43	20.04	18.27	15.56	15.05
14	09.39	08.23	06.55	06.15	04.43	03.43	04.10	05.30	06.52	08.10	08.37	09.47
	15.42	17.10	18.28	20.51	22.14	23.20	23.03	21.40	20.01	18.24	15.54	15.04
15	09.37	08.20	06.52	06.11	04.41	03.43	04.12	05.33	06.55	08.13	08.40	09.48
	15.45	17.13	18.31	20.54	22.17	23.21	23.01	21.37	19.58	18.21	15.51	15.04
16	09.36	08.17	06.49	06.08	04.38	03.42	04.15	05.36	06.57	08.16	08.43	09.50
	15.47	17.15	18.33	20.57	22.19	23.22	22.58	21.34	19.54	18.18	15.49	15.04
17	09.34	08.14	06.46	06.05	04.35	03.42	04.17	05.38	07.00	08.18	08.46	09.51
	15.50	17.18	18.36	20.59	22.22	23.23	22.56	21.31	19.51	18.14	15.46	15.03
18	09.32	08.11	06.42	06.02	04.33	03.41	04.19	05.41	07.02	08.21	08.48	09.52
	15.52	17.21	18.39	21.02	22.25	23.24	22.54	21.28	19.48	18.11	15.44	15.03
19	09.30	08.08	06.39	05.59	04.30	03.41	04.22	05.44	07.05	08.24	08.51	09.53
	15.55	17.24	18.41	21.05	22.27	23.24	22.52	21.25	19.45	18.08	15.41	15.04
20	09.28	08.05	06.36	05.55	04.28	03.41	04.24	05.46	07.07	08.27	08.54	09.53
	15.58	17.27	18.44	21.08	22.30	23.25	22.50	21.22	19.41	18.05	15.39	15.04
21	09.26	08.02	06.33	05.52	04.25	03.41	04.26	05.49	07.10	08.29	08.57	09.54
	16.00	17.30	18.47	21.10	22.33	23.25	22.47	21.19	19.38	18.02	15.37	15.04
22	09.23	07.59	06.29	05.49	04.23	03.41	04.29	05.52	07.13	08.32	08.59	09.55
	16.03	17.33	18.49	21.13	22.35	23.25	22.45	21.15	19.35	17.59	15.35	15.04
23	09.21	07.56	06.26	05.46	04.20	03.41	04.31	05.54	07.15	08.35	09.02	09.55
	16.06	17.35	18.52	21.16	22.38	23.25	22.42	21.12	19.32	17.56	15.33	15.05
24	09.19	07.53	06.23	05.43	04.18	03.42	04.34	05.57	07.18	08.38	09.05	09.56
	16.09	17.38	18.55	21.19	22.40	23.25	22.40	21.09	19.28	17.53	15.31	15.06
25	09.17	07.49	06.20	05.40	04.16	03.42	04.37	06.00	07.20	07.40	09.07	09.56
	16.12	17.41	18.57	21.21	22.43	23.25	22.37	21.06	19.25	16.50	15.29	15.06
26	09.14	07.46	06.16	05.37	04.13	03.43	04.39	06.02	07.23	07.43	09.10	09.56
	16.14	17.44	19.00	21.24	22.45	23.25	22.35	21.03	19.22	16.47	15.27	15.07
27	09.12	07.43	06.13	05.33	04.11	03.44	04.42	06.05	07.25	07.46	09.12	09.56
	16.17	17.47	19.03	21.27	22.48	23.24	22.32	20.59	19.19	16.44	15.25	15.08
28	09.09	07.40	06.10	05.30	04.09	03.44	04.44	06.08	07.28	07.49	09.15	09.56
	16.20	17.50	19.05	21.30	22.50	23.24	22.29	20.56	19.15	16.41	15.23	15.09
29	09.07		07.07	05.27	04.07	03.45	04.47	06.10	07.31	07.52	09.17	09.56
	16.23		20.08	21.32	22.52	23.23	22.27	20.53	19.12	16.38	15.21	15.11
30	09.04		07.03	05.24	04.05	03.46	04.50	06.13	07.33	07.54	09.20	09.56
	16.26		20.11	21.35	22.55	23.23	22.24	20.50	19.09	16.35	15.19	15.12
31	09.02		07.00		04.03		04.52	06.16		07.57		09.55
	16.29		20.13		22.57		22.21	20.47		16.32		15.13
Potential sun hours	194	247	364	443	547	586	578	495	390	311	215	167
Sum of minutes with flicker	0	0	0	0	0	0	0	0	0	0	0	0

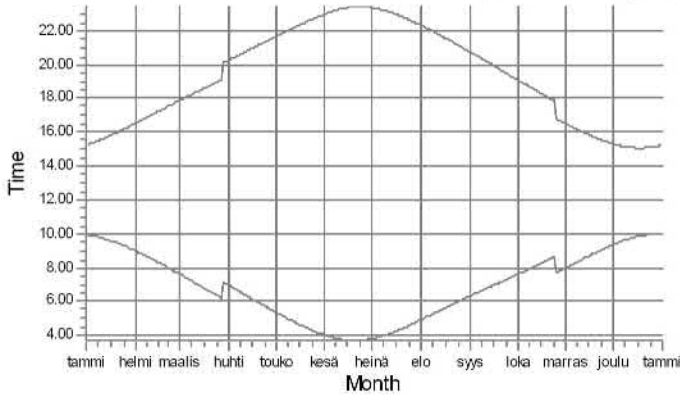
Table layout: For each day in each month the following matrix apply

Day in month Sun rise (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker
Sun set (hh:mm) First time (hh:mm) with flicker-Last time (hh:mm) with flicker/Minutes with flicker

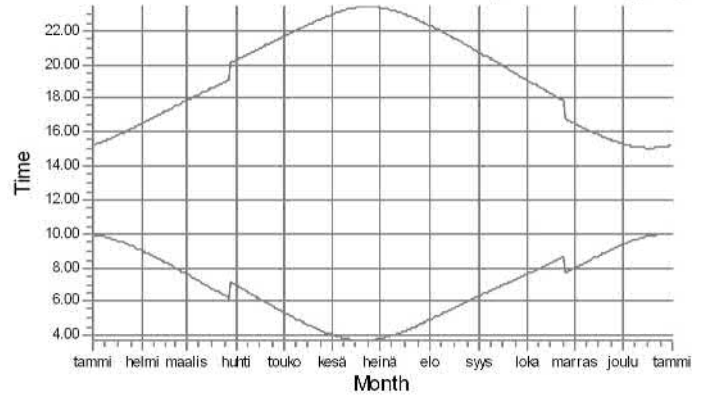
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_Forest_20211130

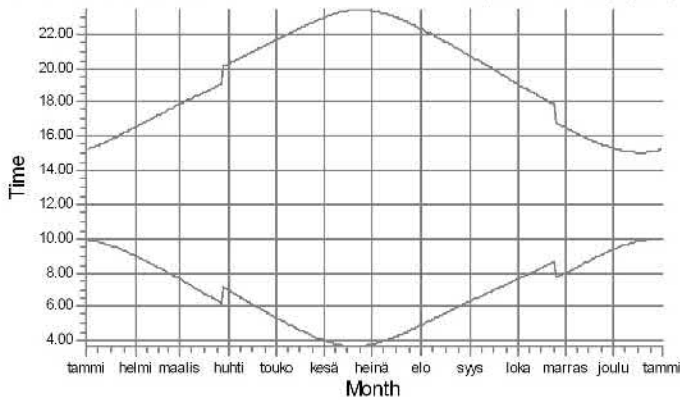
1: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (712)



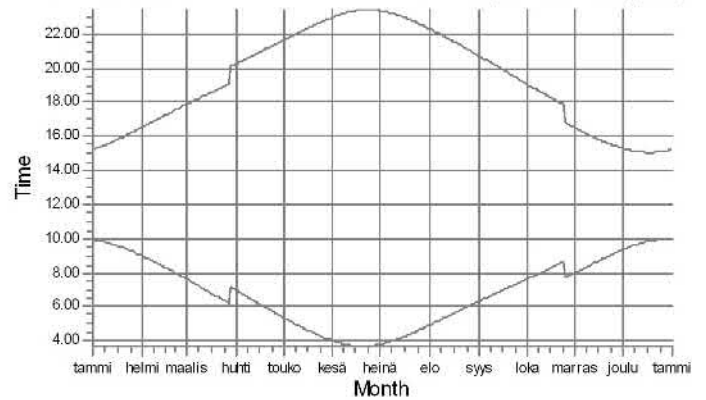
2: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (713)



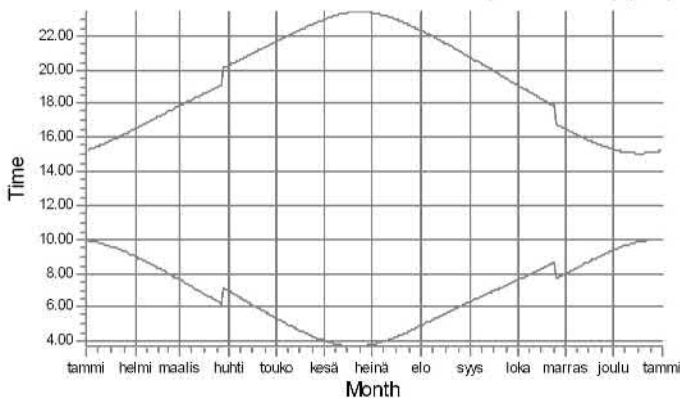
3: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (714)



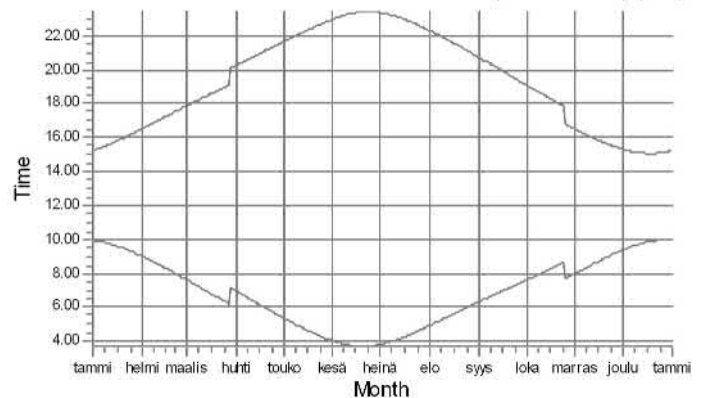
4: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (715)



5: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (716)



6: NORDEX N117/2400 2400 116.8 IOL hub: 120,0 m (TOT: 178,4 m) (717)

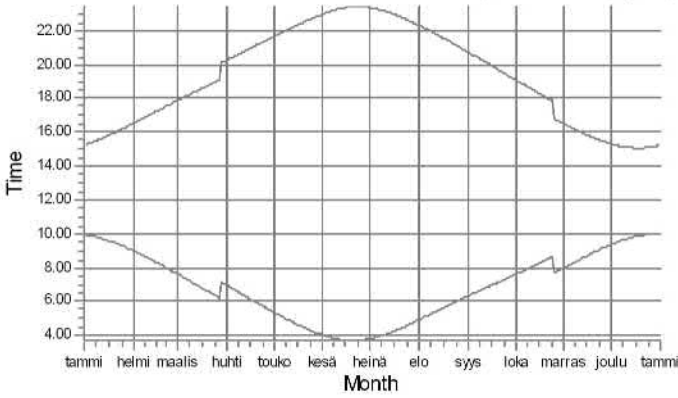


Shadow receptors

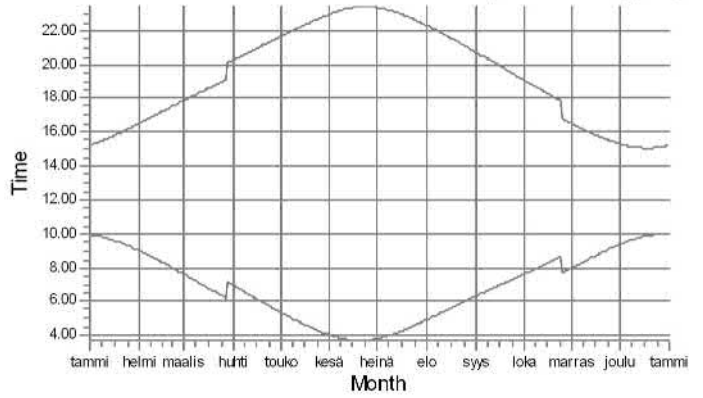
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_Forest_20211130

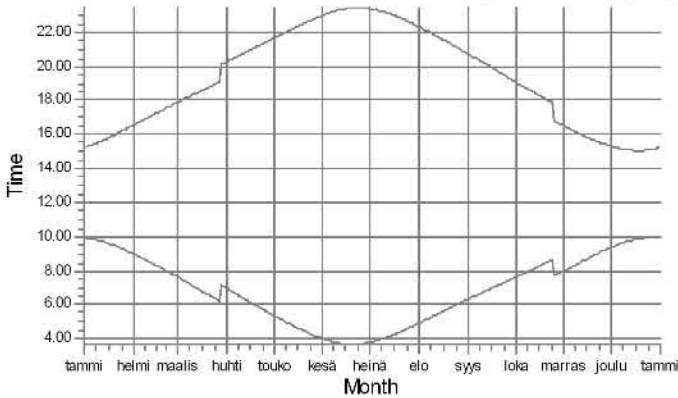
7: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (718)



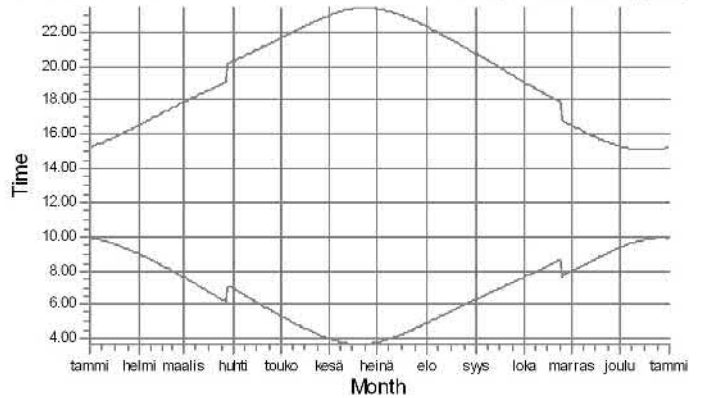
8: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (719)



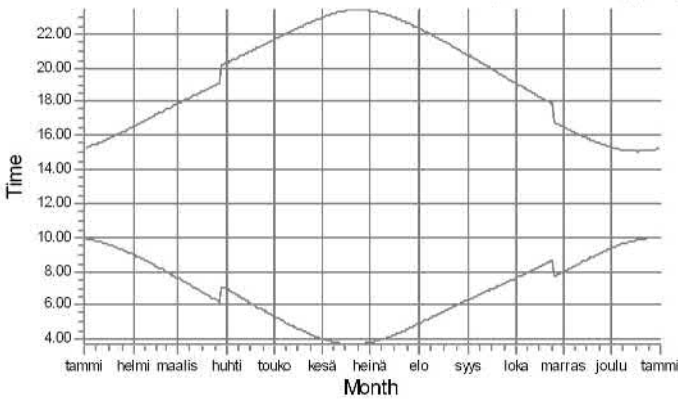
9: NORDEX N117/2400 2400 116.8 IOI hub: 120,0 m (TOT: 178,4 m) (720)



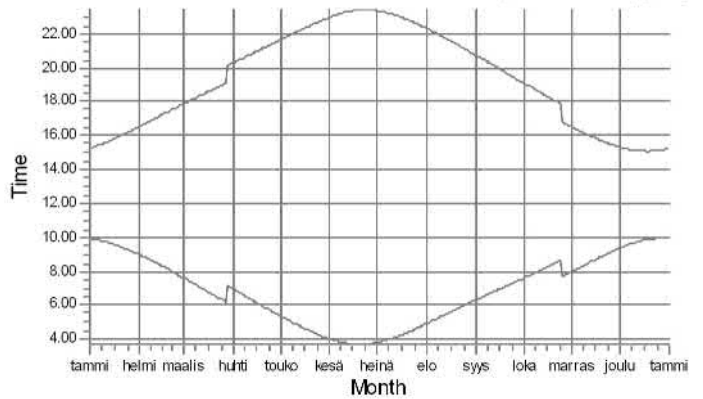
10: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (721)



11: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (722)



12: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (723)

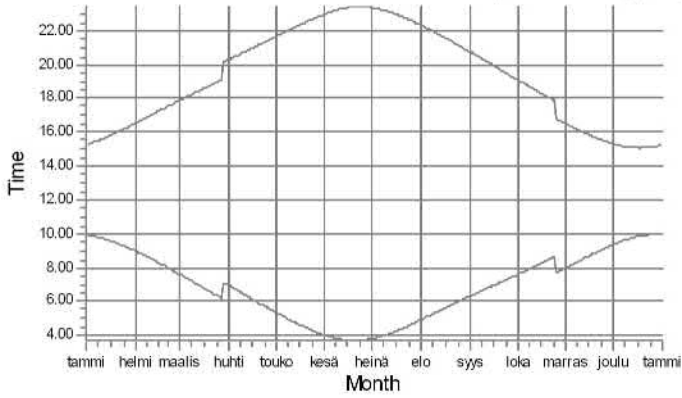


Shadow receptors

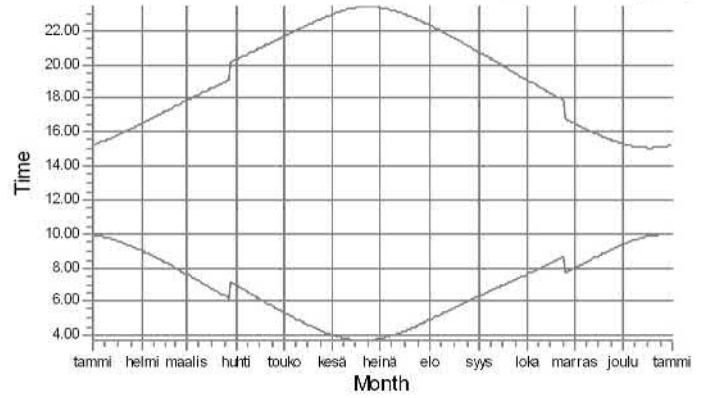
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_Forest_20211130

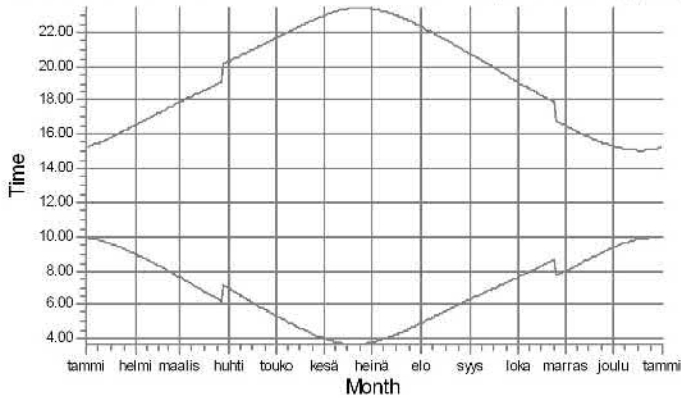
13: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (724



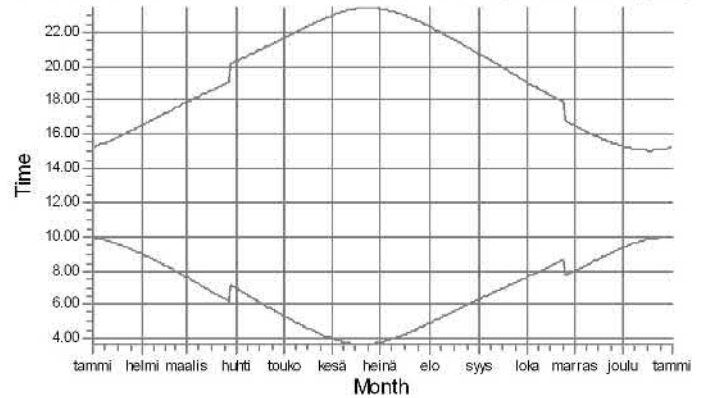
14: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (725



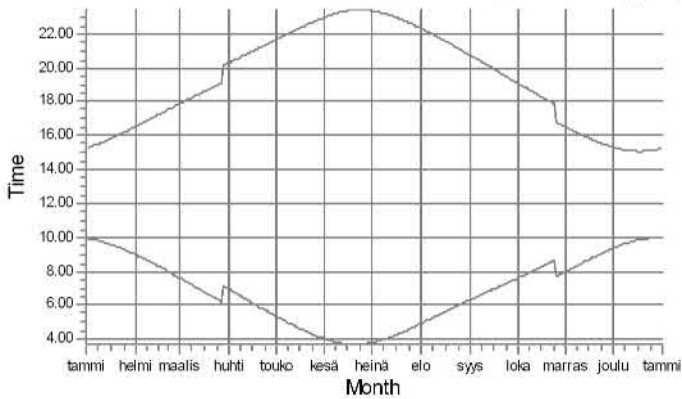
15: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (726



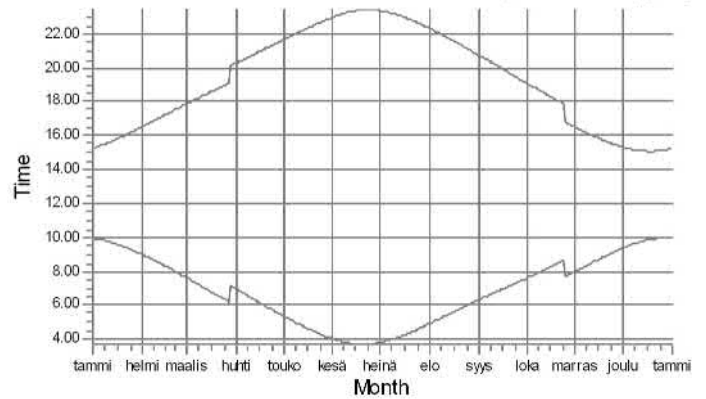
16: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (727



17: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (728



18: NORDEX N131/3000 3000 131.0 IOI hub: 144,0 m (TOT: 209,5 m) (729

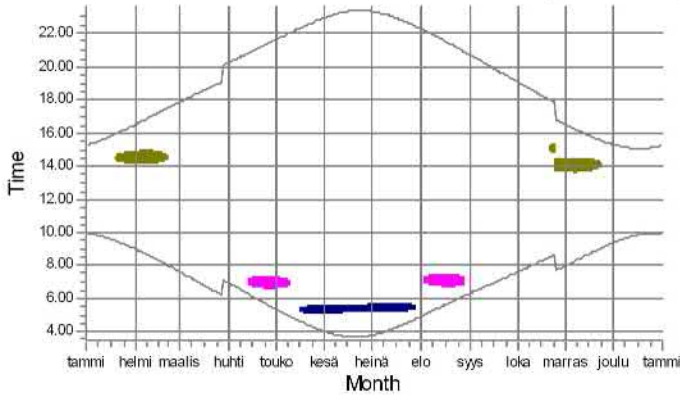


Shadow receptors

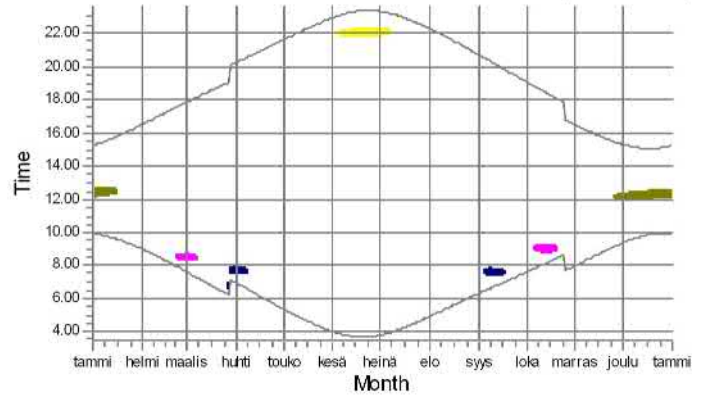
SHADOW - Calendar per WTG, graphical

Calculation: Paholammi_VE2_Shadow_Forest_20211130

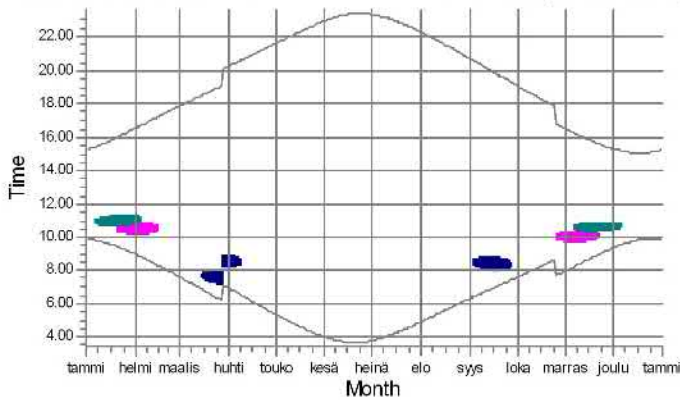
19: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



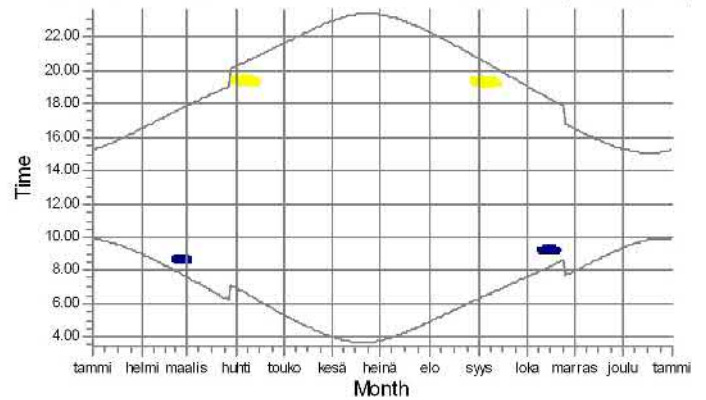
20: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



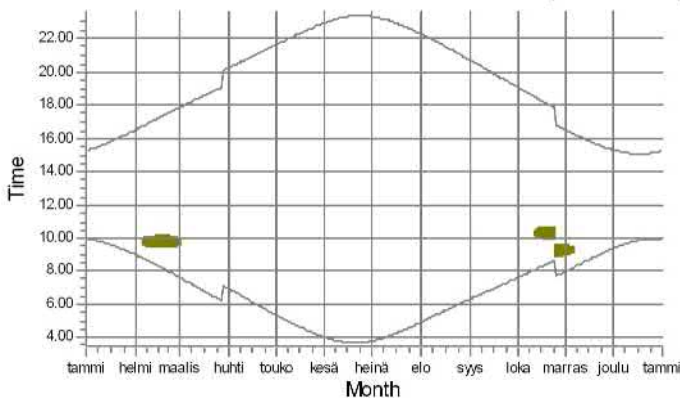
21: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



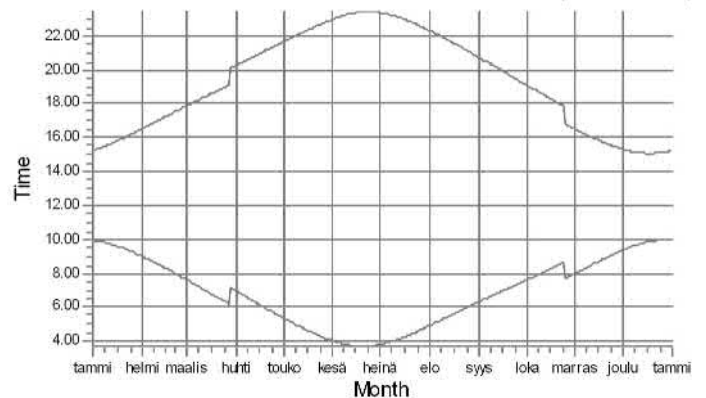
22: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



23: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



24: VESTAS V162-6.0 HH169 6000 162.0 IO! hub: 169,0 m (TOT: 250,0 m)



Shadow receptors



B: Asuinrakennus B, ~Ristiläntie 459
E: Asuinrakennus E, ~Välisälontie 130
F: Asuinrakennus F, ~Välisälontie 101



G: Asuinrakennus G, ~Kankaanpääntie 468
J: Asuinrakennus J, ~Penkkinevantie 85

Project:

Paholammi /Neoen

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+358104095666

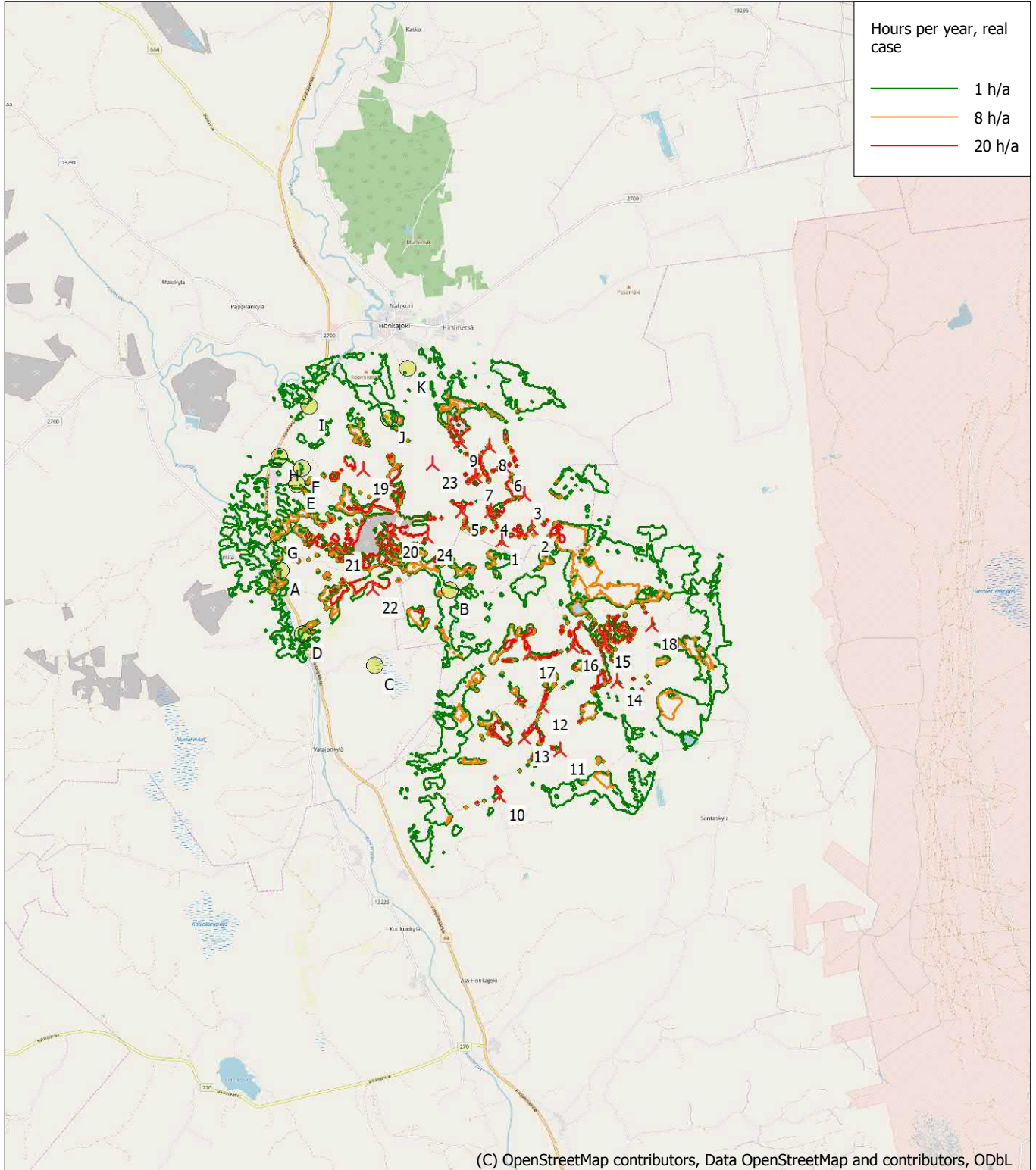
Johanna Harju / johanna.harju@fcg.fi

Calculated:

30.11.2021 12.12/3.4.388

SHADOW - Map

Calculation: Paholammi_VE2_Shadow_Forest_20211130



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

0 1 2 3 4 km

Map: EMD OpenStreetMap , Print scale 1:100 000, Map center Finish TM ETRS-TM35FIN-ETRS89 East: 253 620 North: 6 877 590

New WTG

Shadow receptor

Flicker map level: Height Contours: CONTOURLINE_EP_Tuulivoimaselvitys_0.wpo (4)