

7 priedas

PROGNOSTINIAI ŠEŠĖLIAVIMO MODELIAVIMO REZULTATAI

Project:

5 VE statyba Akmenės rajone

Description:

Organizatorius: UAB "GREEN CHARGE"

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Licensed user:

Alytaus Kolegija

Merkines str. 2b

LT-62252 Alytus

+370 612 64346

user / nerijus.cesiulis@akolegija.lt

Calculated:

2018.10.19 10:24/2.9.269

Prognostiniai šešėliavimo modeliavimo rezultatai**VE modelis: Vestas V150-4.2, 4200 kW, bokšto aukštis 166 m, rotoriaus skersmuo 150 m, bendras aukštis 241 m****SHADOW - Main Result****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) [KAUNAS]

| Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 1,41 | 2,36 | 4,03 | 5,55 | 8,35 | 8,36 | 8,16 | 7,72 | 5,06 | 3,23 | 1,33 | 0,98 |

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

Site data 12 sectors; Radius: 20.000 m (2)

Operational time

| N | NNE | ENE | E | ESE | SSE | S | SSW | WSW | W | WNW | NNW | Sum |
|-----|-----|-----|-----|-----|-----|-----|-----|-------|-------|-----|-----|-------|
| 889 | 575 | 277 | 279 | 531 | 628 | 744 | 965 | 1.163 | 1.042 | 806 | 580 | 8.479 |

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

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

Height contours used: Height Contours: MAPFILES_Akmene_0.map (1)

Obstacles used in calculation

Eye height: 1,5 m

Grid resolution: 10,0 m

WTGs

| | Lithuanian TM LKS94-LKS94 (LT) | | | | WTG type | | | | Shadow data | | | |
|------|--------------------------------|-----------|------|--------------------------------|----------|-----------|----------------|-------------------|--------------------|----------------|--------------------------|-----------|
| | East | North | Z | Row data/Description | Valid | Manufact. | Type-generator | Power, rated [kW] | Rotor diameter [m] | Hub height [m] | Calculation distance [m] | RPM [RPM] |
| | | | [m] | | | | | | | | | |
| VE01 | 436.894 | 6.242.632 | 75,0 | VESTAS V150-4.2 4200 150.0 ... | Yes | VESTAS | V150-4.2-4.200 | 4.200 | 150,0 | 166,0 | 1.901 | 10,4 |
| VE02 | 437.205 | 6.242.132 | 75,0 | VESTAS V150-4.2 4200 150.0 ... | Yes | VESTAS | V150-4.2-4.200 | 4.200 | 150,0 | 166,0 | 1.901 | 10,4 |
| VE03 | 437.702 | 6.242.746 | 75,0 | VESTAS V150-4.2 4200 150.0 ... | Yes | VESTAS | V150-4.2-4.200 | 4.200 | 150,0 | 166,0 | 1.901 | 10,4 |
| VE04 | 438.120 | 6.243.221 | 75,0 | VESTAS V150-4.2 4200 150.0 ... | Yes | VESTAS | V150-4.2-4.200 | 4.200 | 150,0 | 166,0 | 1.901 | 10,4 |
| VE05 | 438.797 | 6.243.113 | 75,0 | VESTAS V150-4.2 4200 150.0 ... | Yes | VESTAS | V150-4.2-4.200 | 4.200 | 150,0 | 166,0 | 1.901 | 10,4 |

Shadow receptor-Input

| No. | Lithuanian TM LKS94-LKS94 (LT) | | | | Height a.g.l. [m] | Degrees from south cw [°] | Slope of window [°] | Direction mode |
|-----|--------------------------------|-----------|------|-----------|-------------------|---------------------------|---------------------|-------------------------|
| | East | North | Z | Width [m] | | | | |
| | | | [m] | [m] | [m] | | | |
| A1 | 436.960 | 6.241.376 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| A2 | 437.280 | 6.241.359 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| A3 | 437.608 | 6.241.424 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| A4 | 437.784 | 6.241.456 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| B | 438.148 | 6.242.100 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| C | 438.304 | 6.242.148 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |
| D | 438.956 | 6.242.384 | 75,0 | 1,0 | 1,0 | 1,0 | 0,0 | 90,0 "Green house mode" |

Calculation Results

Shadow receptor

Shadow, expected values

| No. | Shadow hours per year [h/year] |
|-----|--------------------------------|
| A1 | 0:00 |

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Project:

11 VE parko statyba Akmenės rajone

Description:

Organizatorius: UAB "VĖJO PARKAI"

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Merkines str. 2b

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user / nerijus.cesiulis@akolegija.lt

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SHADOW - Main Result

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Shadow, expected values

| No. | Shadow hours per year [h/year] |
|-----|--------------------------------------|
| A2 | 0:00 |
| A3 | 0:00 |
| A4 | 0:00 |
| B | 11:21 |
| C | 7:28 |
| D | 5:35 |

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

| No. | Name | Worst case [h/year] | Expected [h/year] |
|------|---|------------------------|----------------------|
| VE01 | VESTAS V150-4.2 4200 150.0 !O! hub: 166,0 m (TOT: 241,0 m) (83) | 26:47 | 7:47 |
| VE02 | VESTAS V150-4.2 4200 150.0 !O! hub: 166,0 m (TOT: 241,0 m) (84) | 36:10 | 8:50 |
| VE03 | VESTAS V150-4.2 4200 150.0 !O! hub: 166,0 m (TOT: 241,0 m) (85) | 15:14 | 4:13 |
| VE04 | VESTAS V150-4.2 4200 150.0 !O! hub: 166,0 m (TOT: 241,0 m) (86) | 0:00 | 0:00 |
| VE05 | VESTAS V150-4.2 4200 150.0 !O! hub: 166,0 m (TOT: 241,0 m) (87) | 0:00 | 0:00 |

Project:

5 VE statyba Akmenės rajone

Description:

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Licensed user:

Alytaus Kolegija

Merkines str. 2b

LT-62252 Alytus

+370 612 64346

user / nerijus.cesiulis@akolegija.lt

Calculated:

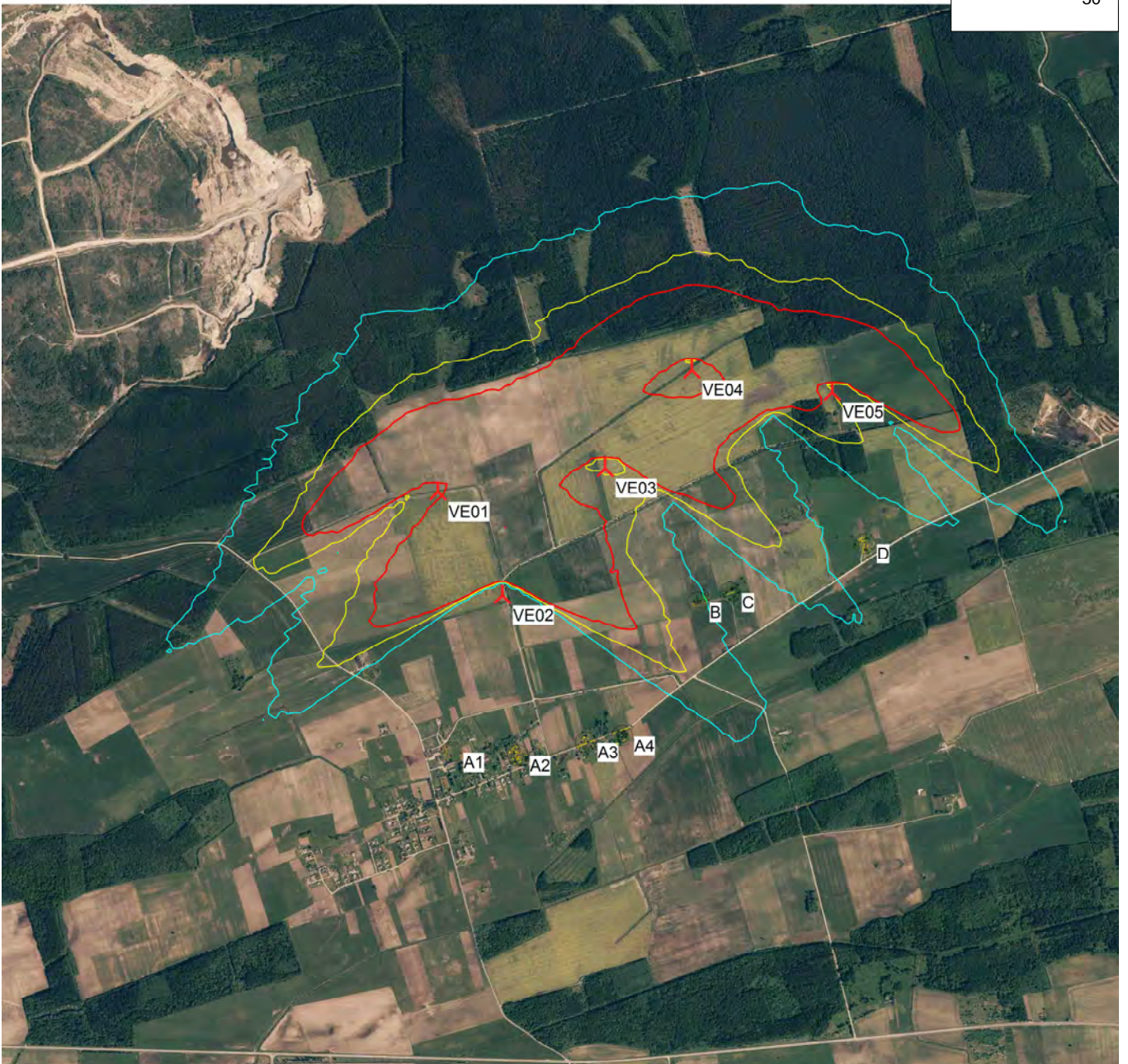
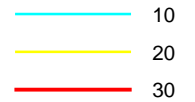
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Prognostiniai šešėliavimo modeliavimo rezultatai

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SHADOW - Map

Hours per year, real case



0 500 1000 1500 2000 m

Map: Akmene (2) , Print scale 1:30.000, Map center Lithuanian TM LKS94-LKS94 (LT) East: 437.344 North: 6.242.677

New WTG

Shadow receptor

Flicker map level: Height Contours: MAPFILES_Akmene_0.map (1)