

Project:

FW\_Wloszakowice

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Calculated:

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## SHADOW - Main Result

**Calculation:** Analiza migotania cienia - skumulowane

### 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

The calculated times are "worst case" given by the following assumptions:

The sun is shining all the day, from sunrise to sunset

The rotor plane is always perpendicular to the line from the WTG to the sun

The WTG is always operating

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\_ONLINEDATA\_0.wj

Obstacles used in calculation

Eye height: 1,5 m

Grid resolution: 10,0 m

### WTGs

| Poland CS 92 |         |         |       |                      | 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] |  |
| 1            | 320 783 | 457 827 | 96,3  | EW_dz.52             | Yes      | NORDEX         | N43-600/125        | 600               | 43,0               | 76,0           | 800                      | 27,2      |  |
| 2            | 320 894 | 457 195 | 100,0 | EW_dz. 58            | Yes      | NORDEX         | N43-600/125        | 600               | 43,0               | 76,0           | 800                      | 27,2      |  |
| 3            | 319 217 | 456 456 | 90,0  | EW_dz.704/23         | No       | TELLUS         | -95/20             | 95                | 19,0               | 22,6           | 2 000                    | 47,0      |  |
| 4            | 319 180 | 456 594 | 91,1  | EW_dz.704/23         | No       | TELLUS         | -95/20             | 95                | 19,0               | 22,6           | 2 000                    | 47,0      |  |
| 5            | 319 277 | 456 567 | 89,7  | EW_dz.704/23         | No       | TELLUS         | -95/20             | 95                | 19,0               | 22,6           | 2 000                    | 47,0      |  |
| 6            | 319 255 | 456 670 | 91,5  | EW_dz.704/23         | No       | NORDEX         | N27/250-250/45     | 250               | 27,0               | 30,0           | 2 000                    | 39,0      |  |
| 7            | 321 031 | 458 965 | 104,0 | EW_1                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 8            | 320 998 | 458 639 | 103,4 | EW_2                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 9            | 320 968 | 458 321 | 100,0 | EW_3                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 10           | 320 922 | 457 946 | 97,9  | EW_4                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 11           | 320 898 | 457 626 | 92,6  | EW_5                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 12           | 320 681 | 455 457 | 100,0 | EW_6                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 13           | 320 688 | 455 168 | 102,0 | EW_7                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 14           | 322 561 | 458 359 | 103,0 | EW_8                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 15           | 322 566 | 458 031 | 99,2  | WE_9                 | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 16           | 322 583 | 457 765 | 98,5  | EW_10                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 17           | 322 573 | 457 457 | 98,0  | EW_11                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 18           | 322 369 | 455 127 | 110,0 | EW_12                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 19           | 322 332 | 454 809 | 110,0 | EW_13                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 20           | 323 450 | 456 611 | 108,5 | EW_14                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 21           | 323 741 | 456 280 | 112,6 | EW_15                | Yes      | ansee          | Wloszakowice-2 000 | 2 000             | 120,0              | 100,0          | 1 506                    | 14,9      |  |
| 22           | 323 651 | 459 243 | 105,6 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 23           | 324 075 | 458 836 | 107,4 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 24           | 324 532 | 459 225 | 106,0 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 25           | 324 937 | 458 746 | 108,8 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 26           | 325 204 | 458 156 | 108,5 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 27           | 325 667 | 458 698 | 106,9 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 28           | 325 789 | 459 228 | 112,0 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 29           | 325 302 | 459 789 | 106,0 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 30           | 325 776 | 460 267 | 103,6 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 31           | 325 128 | 460 387 | 100,7 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 32           | 325 755 | 460 871 | 102,1 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 33           | 325 151 | 460 783 | 102,7 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 34           | 325 241 | 461 503 | 104,6 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 35           | 325 792 | 461 297 | 104,2 | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |
| 36           | 325 249 | 461 921 | 96,5  | EW_Smigiel           | No       | GE WIND ENERGY | GE 2.5xl-2 500     | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |  |

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**SHADOW - Main Result****Calculation:** Analiza migotania cienia - skumulowane

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| Poland CS 92 |         |         |                      | WTG type |                | Type-generator | Power, rated [kW] | Rotor diameter [m] | Hub height [m] | Shadow data              |           |
|--------------|---------|---------|----------------------|----------|----------------|----------------|-------------------|--------------------|----------------|--------------------------|-----------|
| East         | North   | Z       | Row data/Description | Valid    | Manufact.      |                |                   |                    |                | Calculation distance [m] | RPM [RPM] |
| 37           | 325 723 | 461 776 | 101,1 EW_Smigiel     | No       | GE WIND ENERGY | GE 2.5xl-2 500 | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |
| 38           | 326 218 | 462 072 | 103,5 EW_Smigiel     | No       | GE WIND ENERGY | GE 2.5xl-2 500 | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |
| 39           | 326 472 | 462 472 | 107,6 EW_Smigiel     | No       | GE WIND ENERGY | GE 2.5xl-2 500 | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |
| 40           | 327 006 | 462 344 | 110,0 EW_Smigiel     | No       | GE WIND ENERGY | GE 2.5xl-2 500 | 2 500             | 100,0              | 100,0          | 1 574                    | 14,0      |

**Shadow receptor-Input**

| Poland CS 92 |                |         |         |       |       |        |               |                       |                 |                    |
|--------------|----------------|---------|---------|-------|-------|--------|---------------|-----------------------|-----------------|--------------------|
| No.          | Name           | East    | North   | Z     | Width | Height | Height a.g.l. | Degrees from south cw | Slope of window | Direction mode     |
|              |                |         |         | [m]   | [m]   | [m]    | [m]           | [°]                   | [°]             |                    |
| A            | Bukowiec Gorny | 320 295 | 455 999 | 95,4  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| B            | Bukowiec Gorny | 320 468 | 456 218 | 93,6  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| C            | Bukowiec Gorny | 320 643 | 456 270 | 93,4  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| D            | Bukowiec Gorny | 320 903 | 456 321 | 95,9  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| E            | Bukowiec Gorny | 321 054 | 456 413 | 96,3  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| F            | Bukowiec Gorny | 320 956 | 456 627 | 95,6  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| G            | Bukowiec Gorny | 321 137 | 456 767 | 97,9  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| H            | Bukowiec Gorny | 321 294 | 456 416 | 101,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| I            | Bukowiec Gorny | 321 268 | 456 816 | 97,9  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| J            | Bukowiec Gorny | 321 523 | 456 436 | 101,7 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| K            | Bukowiec Gorny | 321 382 | 456 739 | 99,1  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| L            | Bukowiec Gorny | 321 581 | 456 751 | 99,5  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| M            | Bukowiec Gorny | 321 795 | 456 889 | 100,5 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| N            | Bukowiec Gorny | 321 818 | 456 469 | 102,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| O            | Bukowiec Gorny | 322 042 | 456 321 | 101,9 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| P            | Bukowiec Gorny | 322 189 | 456 627 | 101,1 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| Q            | Bukowiec Gorny | 322 088 | 456 749 | 100,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| R            | Bukowiec Gorny | 322 039 | 456 975 | 100,6 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| S            | Bukowiec Gorny | 322 364 | 456 391 | 102,4 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| T            | Bukowiec Gorny | 322 313 | 456 178 | 104,5 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| U            | Bukowiec Gorny | 322 541 | 456 115 | 106,6 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| V            | Bukowiec Gorny | 322 468 | 455 938 | 108,2 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| W            | Bukowiec Gorny | 322 811 | 455 979 | 109,2 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| X            | Bukowiec Gorny | 322 925 | 455 915 | 112,7 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| Y            | Bukowiec Gorny | 322 786 | 455 745 | 111,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| Z            | Bukowiec Gorny | 322 929 | 455 632 | 114,9 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AA           | Bukowiec Gorny | 323 225 | 455 861 | 114,8 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AB           | Bukowiec Gorny | 323 006 | 455 371 | 113,6 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AC           | Bukowiec Gorny | 322 999 | 455 249 | 115,1 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AD           | Bukowiec Gorny | 322 022 | 458 531 | 105,4 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AE           | Wloszakowice   | 319 171 | 456 145 | 85,1  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AF           | Wloszakowice   | 319 731 | 455 901 | 88,5  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AG           | Wloszakowice   | 320 022 | 455 660 | 101,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AH           | Wloszakowice   | 319 869 | 455 570 | 102,3 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AI           | Wloszakowice   | 319 677 | 455 488 | 98,8  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AJ           | Wloszakowice   | 319 710 | 455 847 | 89,3  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AK           | Wloszakowice   | 319 518 | 455 287 | 93,6  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AL           | Wloszakowice   | 319 518 | 455 799 | 92,5  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AM           | Wloszakowice   | 319 645 | 454 893 | 90,3  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AN           | Wloszakowice   | 320 440 | 454 278 | 98,8  | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AO           | Sadzia         | 323 326 | 454 414 | 112,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AP           | Sadzia         | 323 386 | 454 251 | 110,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AQ           | Sadzia         | 322 063 | 453 988 | 112,5 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AR           | Janowko        | 323 170 | 457 480 | 104,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AS           | Janowko        | 323 191 | 457 553 | 103,8 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AT           | Machcin        | 323 721 | 458 036 | 104,4 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AU           | Machcin        | 323 847 | 458 183 | 105,0 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |
| AV           | Machcin        | 323 585 | 458 207 | 104,9 | 2,2   | 1,2    | 1,2           | 0,0                   | 90,0            | "Green house mode" |

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**SHADOW - Main Result****Calculation:** Analiza migotania cienia - skumulowane

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**Poland CS 92**

| No. | Name    | East    | North   | Z     | Width | Height | Height<br>a.g.l. | Degrees from<br>south cw | Slope of<br>window | Direction mode     |
|-----|---------|---------|---------|-------|-------|--------|------------------|--------------------------|--------------------|--------------------|
|     |         |         |         | [m]   | [m]   | [m]    | [m]              | [°]                      | [°]                |                    |
| AW  | Machcin | 323 567 | 458 255 | 104,3 | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| AX  | Kierzki | 321 953 | 459 371 | 102,0 | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| AY  | Skarzyn | 322 406 | 459 515 | 106,4 | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| AZ  | Dluzyna | 320 506 | 459 433 | 97,0  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BA  | Dluzyna | 320 174 | 459 406 | 91,2  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BB  | Dluzyna | 319 938 | 458 680 | 97,3  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BC  | Dluzyna | 320 090 | 458 560 | 98,0  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BD  | Dluzyna | 320 028 | 458 371 | 97,5  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BE  | Dluzyna | 320 139 | 458 237 | 98,0  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BF  | Dluzyna | 320 002 | 458 095 | 97,0  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |
| BG  | Dluzyna | 319 999 | 457 849 | 97,8  | 2,2   | 1,2    | 1,2              | 0,0                      | 90,0               | "Green house mode" |

**Calculation Results**

Shadow receptor

**Shadow, worst case**

| No. | Name           | Shadow hours<br>per year<br>[h/year] | Shadow days<br>per year<br>[days/year] | Max shadow<br>hours per day<br>[h/day] |
|-----|----------------|--------------------------------------|----------------------------------------|----------------------------------------|
| A   | Bukowiec Gorny | 60:14                                | 90                                     | 0:49                                   |
| B   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| C   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| D   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| E   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| F   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| G   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| H   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| I   | Bukowiec Gorny | 10:16                                | 47                                     | 0:20                                   |
| J   | Bukowiec Gorny | 9:15                                 | 35                                     | 0:20                                   |
| K   | Bukowiec Gorny | 13:56                                | 55                                     | 0:21                                   |
| L   | Bukowiec Gorny | 0:30                                 | 14                                     | 0:03                                   |
| M   | Bukowiec Gorny | 0:56                                 | 18                                     | 0:04                                   |
| N   | Bukowiec Gorny | 0:00                                 | 0                                      | 0:00                                   |
| O   | Bukowiec Gorny | 5:58                                 | 27                                     | 0:20                                   |
| P   | Bukowiec Gorny | 7:22                                 | 29                                     | 0:23                                   |
| Q   | Bukowiec Gorny | 13:53                                | 70                                     | 0:21                                   |
| R   | Bukowiec Gorny | 16:49                                | 75                                     | 0:22                                   |
| S   | Bukowiec Gorny | 17:46                                | 63                                     | 0:26                                   |
| T   | Bukowiec Gorny | 18:11                                | 71                                     | 0:25                                   |
| U   | Bukowiec Gorny | 36:45                                | 102                                    | 0:30                                   |
| V   | Bukowiec Gorny | 11:23                                | 61                                     | 0:22                                   |
| W   | Bukowiec Gorny | 20:03                                | 54                                     | 0:30                                   |
| X   | Bukowiec Gorny | 51:51                                | 124                                    | 0:34                                   |
| Y   | Bukowiec Gorny | 57:20                                | 126                                    | 0:40                                   |
| Z   | Bukowiec Gorny | 53:17                                | 100                                    | 0:39                                   |
| AA  | Bukowiec Gorny | 22:04                                | 80                                     | 0:27                                   |
| AB  | Bukowiec Gorny | 56:54                                | 127                                    | 0:41                                   |
| AC  | Bukowiec Gorny | 56:23                                | 112                                    | 0:43                                   |
| AD  | Bukowiec Gorny | 152:07                               | 259                                    | 1:13                                   |
| AE  | Wloszakowice   | 0:00                                 | 0                                      | 0:00                                   |
| AF  | Wloszakowice   | 24:12                                | 76                                     | 0:27                                   |
| AG  | Wloszakowice   | 50:42                                | 105                                    | 0:41                                   |
| AH  | Wloszakowice   | 34:54                                | 86                                     | 0:34                                   |
| AI  | Wloszakowice   | 23:13                                | 70                                     | 0:28                                   |
| AJ  | Wloszakowice   | 23:11                                | 72                                     | 0:27                                   |
| AK  | Wloszakowice   | 18:30                                | 64                                     | 0:24                                   |
| AL  | Wloszakowice   | 15:31                                | 60                                     | 0:23                                   |
| AM  | Wloszakowice   | 38:58                                | 111                                    | 0:27                                   |
| AN  | Wloszakowice   | 0:00                                 | 0                                      | 0:00                                   |

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2013-07-29 11:17/2.9.250

## SHADOW - Main Result

**Calculation:** Analiza migotania cienia - skumulowane

...continued from previous page

### Shadow, worst case

| No. | Name    | Shadow hours         | Shadow days             | Max shadow               |
|-----|---------|----------------------|-------------------------|--------------------------|
|     |         | per year<br>[h/year] | per year<br>[days/year] | hours per day<br>[h/day] |
| AO  | Sadzia  | 24:13                | 91                      | 0:28                     |
| AP  | Sadzia  | 15:44                | 56                      | 0:25                     |
| AQ  | Sadzia  | 0:00                 | 0                       | 0:00                     |
| AR  | Janowko | 102:07               | 159                     | 0:46                     |
| AS  | Janowko | 93:22                | 181                     | 0:45                     |
| AT  | Machcin | 48:35                | 200                     | 0:24                     |
| AU  | Machcin | 45:21                | 190                     | 0:21                     |
| AV  | Machcin | 47:43                | 175                     | 0:27                     |
| AW  | Machcin | 49:58                | 182                     | 0:28                     |
| AX  | Kierzki | 37:12                | 124                     | 0:28                     |
| AY  | Skarzyn | 9:16                 | 47                      | 0:19                     |
| AZ  | Dluzyna | 55:32                | 115                     | 0:41                     |
| BA  | Dluzyna | 41:13                | 129                     | 0:30                     |
| BB  | Dluzyna | 58:40                | 200                     | 0:26                     |
| BC  | Dluzyna | 95:20                | 270                     | 0:31                     |
| BD  | Dluzyna | 76:49                | 225                     | 0:30                     |
| BE  | Dluzyna | 98:10                | 235                     | 0:34                     |
| BF  | Dluzyna | 68:10                | 188                     | 0:30                     |
| BG  | Dluzyna | 62:45                | 179                     | 0:31                     |

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

| No. | Name         | Worst case | Expected |
|-----|--------------|------------|----------|
|     |              | [h/year]   | [h/year] |
| 1   | EW_dz.52     | 6:34       |          |
| 2   | EW_dz. 58    | 0:00       |          |
| 3   | EW_dz.704/23 | 0:00       |          |
| 4   | EW_dz.704/23 | 0:00       |          |
| 5   | EW_dz.704/23 | 0:00       |          |
| 6   | EW_dz.704/23 | 0:00       |          |
| 7   | EW_1         | 139:34     |          |
| 8   | EW_2         | 156:25     |          |
| 9   | EW_3         | 132:21     |          |
| 10  | EW_4         | 80:49      |          |
| 11  | EW_5         | 96:59      |          |
| 12  | EW_6         | 173:23     |          |
| 13  | EW_7         | 79:12      |          |
| 14  | EW_8         | 65:17      |          |
| 15  | WE_9         | 73:26      |          |
| 16  | EW_10        | 153:15     |          |
| 17  | EW_11        | 108:09     |          |
| 18  | EW_12        | 147:49     |          |
| 19  | EW_13        | 92:40      |          |
| 20  | EW_14        | 73:41      |          |
| 21  | EW_15        | 98:17      |          |
| 22  | EW_Smigiel   | 4:48       |          |
| 23  | EW_Smigiel   | 0:00       |          |
| 24  | EW_Smigiel   | 0:00       |          |
| 25  | EW_Smigiel   | 36:16      |          |
| 26  | EW_Smigiel   | 7:46       |          |
| 27  | EW_Smigiel   | 0:00       |          |
| 28  | EW_Smigiel   | 0:00       |          |
| 29  | EW_Smigiel   | 0:00       |          |
| 30  | EW_Smigiel   | 0:00       |          |
| 31  | EW_Smigiel   | 0:00       |          |
| 32  | EW_Smigiel   | 0:00       |          |
| 33  | EW_Smigiel   | 0:00       |          |
| 34  | EW_Smigiel   | 0:00       |          |
| 35  | EW_Smigiel   | 0:00       |          |
| 36  | EW_Smigiel   | 0:00       |          |

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## SHADOW - Main Result

**Calculation:** Analiza migotania cienia - skumulowane

...continued from previous page

| No. | Name       | Worst case<br>[h/year] | Expected<br>[h/year] |
|-----|------------|------------------------|----------------------|
| 37  | EW_Smigiel | 0:00                   |                      |
| 38  | EW_Smigiel | 0:00                   |                      |
| 39  | EW_Smigiel | 0:00                   |                      |
| 40  | EW_Smigiel | 0:00                   |                      |