

8. ZYSKI SŁONECZNE

8.1 Budynek/lokal oceniany

stacja **Częstochowa**

| Typ okna | Ag*g*Z lub Ag*g*K _α | orientacja | Wartość promieniowania słonecznego w miesiącu w Wh na 1 m ² | | | | | | | | |
|----------|-----------------------------------|------------|--|--------|--------|---------|---------|--------|--------|--------|--------|
| | | | I | II | III | IV | V | IX | X | XI | XII |
| OP-1 | 0,6804 | S | 33 984 | 51 173 | 74 779 | 100 347 | 117 750 | 86 555 | 68 269 | 41 906 | 33 684 |
| D1 | 0 | S | 33 984 | 51 173 | 74 779 | 100 347 | 117 750 | 86 555 | 68 269 | 41 906 | 33 684 |
| D2 | 0 | S | 33 984 | 51 173 | 74 779 | 100 347 | 117 750 | 86 555 | 68 269 | 41 906 | 33 684 |
| D3 | 0 | E | 20 761 | 31 243 | 58 735 | 92 948 | 122 936 | 74 160 | 44 687 | 24 293 | 19 081 |
| BG | 0 | S | 33 984 | 51 173 | 74 779 | 100 347 | 117 750 | 86 555 | 68 269 | 41 906 | 33 684 |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| OD-1 | 0,56595 | S | 33 984 | 51 173 | 74 779 | 100 347 | 117 750 | 86 555 | 68 269 | 41 906 | 33 684 |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |
| 0 | 0 | 0 | | | | | | | | | |

9. BILANS MIESIĘCZNY

9.1. Budynek/lokal oceniany

miejsowość

Częstochowa

| | | Dane dla miesięcy | | | | | | | | |
|---|---------------------|-------------------|------------|------------|------------|------------|------------|------------|------------|------------|
| | | I | II | III | IV | V | IX | X | XI | XII |
| Średnia temp. miesięczna | Θ_e | -3,7 | -0,8 | 4,4 | 8,0 | 14,9 | 13,2 | 8,8 | 3,4 | -1,4 |
| Temperatura wewnętrzna | $\Theta_{int,H}$ | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Liczba godzin | t_M | 744 | 672 | 744 | 720 | 744 | 720 | 744 | 720 | 744 |
| Straty $Q_{H,ht}=H*(\Theta_{int,H}-\Theta_e)*t_M$ | [kWh] | 3214,86 | 2453,43 | 1822,33 | 1164,60 | 17,19 | 299,47 | 1065,89 | 1929,92 | 2819,45 |
| Zyski Q_{sol} | [kWh] | 42,36 | 63,78 | 93,20 | 125,07 | 146,76 | 107,88 | 85,09 | 52,23 | 41,98 |
| Moc zysków cieplnych q_{int} | [W/m ²] | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 | 4,7 |
| Zyski wew. $Q_i=q_{int}*A_c*t_M/1000$ | [kWh] | 396,53712 | 358,16256 | 396,53712 | 383,7456 | 396,53712 | 383,7456 | 396,53712 | 383,7456 | 396,53712 |
| Zyski cał $Q_{H,gn}=Q_{sol}+Q_{int}$ | [kWh] | 438,89 | 421,94 | 489,74 | 508,81 | 543,29 | 491,62 | 481,62 | 435,98 | 438,52 |
| Stosunek zysków do strat $\gamma =Q_{H,gn}/Q_{H,ht}$ | | 0,137 | 0,172 | 0,269 | 0,437 | 31,602 | 1,642 | 0,452 | 0,226 | 0,156 |
| C_m - wew. poj. cieplna budynku | [J/K] | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 | 41 958 000 |
| Stała czasowa $\tau =(C_m/3600)/(H_{tr}+H_{ve})$ | [h] | 50,44 | 50,44 | 50,44 | 50,44 | 50,44 | 50,44 | 50,44 | 50,44 | 50,44 |
| Parametr numeryczny $\alpha_H=1+\tau/15$ | | 4,3626 | 4,3626 | 4,3626 | 4,3626 | 4,3626 | 4,3626 | 4,3626 | 4,3626 | 4,3626 |
| Sprawność wykorzystania zysków $\eta_{H,gh}=(1-\gamma^{aH})/(1-\gamma^{aH+1})$ | | 0,9999 | 0,9996 | 0,9976 | 0,9846 | 0,0316 | 0,5797 | 0,9826 | 0,9988 | 0,9997 |
| $Q_{H,nd,n}=Q_{H,ht}-\eta_{H,gn}*Q_{H,gn}$ | [kWh] | 2 776,0 | 2 031,7 | 1 333,8 | 663,6 | 0,0 | 14,5 | 592,6 | 1 494,5 | 2 381,0 |

| | | | |
|---------------------------------|-----|-----------------|------------------|
| Suma $Q_{H,nd}$ | kWh | 11 287,7 | energia użytkowa |
| $Q_{K,H}=Q_{H,nd}/\eta_{H,tot}$ | kWh | 12 529,3 | energia końcowa |

Dla energii pomocniczej ogrzew+went

| | ogrzewanie | | | wentylacja | | |
|--------------|---------------|------------|---------------|------------|------------|------------|
| | $q_{el,H}$ | $t_{el,H}$ | $E_{el,H}$ | $q_{el,V}$ | $t_{el,V}$ | $E_{el,V}$ |
| | 0,3 | 3000 | 102,06 | 0 | 0 | 0 |
| $E_{el,pom}$ | 102,06 | | | | | |

tab.19/40

| | |
|-----------|---|
| $w_H=$ | 3 |
| $w_{el}=$ | 3 |

Zapotrzebowanie na energię pierwotną $Q_{P,H}$

$$Q_{P,H}=w_H*Q_{K,H}+w_{el}*E_{el,pom,H} = \boxed{37\,894} \text{ kWh/rok}$$