

Contribution of the Polish side to the Task 45

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Energy-Efficient Electric Lighting for Buildings. Annex 45
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Contribution to the Task 45

1. Estimation of the present and the future energy consumption for the lighting purposes in Poland on the base of the detail analysis of the typical examples (private houses, offices). There will be predicted need for the energy efficient lighting.
2. Impact of the energy efficient lamps on the other building systems and electric energy users (electromagnetic compatibility).
3. Impact of the increased number (and power) of the energy efficient lamps (increase of harmonics) on the electric energy quality. Are there necessary any activities to minimise this influence (e.g. filters) ?
4. Case study: 5 stories building of the IT firm WASKO in Gliwice with the controlled venetian blinds. Influence of the control and personnel behaviour on the electric energy consumption.

Estimated electric energy savings

Households total electric energy consumption in
2002 – 21 659 GWh

- In it lighting (estimated 30%) – 6 497 GWh

Estimated possible energy savings (10-30%) – 648-
1949 GWh

Electric energy consumption / household /person –
683 kWh

Pay back time of the energy saving lamp (example)

Price of the incandescent lamp 15W – 0,9PLN (0,21 Euro)

Price of the energy-efficient lamp 15W – 15PLN (3,49 Euro)

Price of the electric energy – 0,33 PLN/kWh (0,077 Euro)

Simple pay back time – 2850 h

1 Euro = 4,3 PLN

Example of the saving potential in the small dwelling house

- Two storey house: 6 rooms, kitchen, bathroom, anteroom and staircase, laundry, boiler room
- Inhabitants: 4 adults
- Power installed:
 - total – 7,2 kW
 - lighting (incandescent only) – 2,3 kW (31,7%)
- Energy consumed:
 - total – 3131 kWh/year
 - lighting – 941 kWh/year (30%)
- Technical energy savings potential – 750 kWh/year
- Economical energy savings potential (pay-back less than two years) – 540 kWh/year

Example of the saving potential in the town hall

- Town – 35 500 inhabitants
- Four storey building, 67 employees, working hours 7³⁰-15³⁰
- Power installed:
 - total – 10 020 W
 - lighting (mostly fluorescent lamps) – 5 400 W
- Effective power (installed power x capacity factor):
 - total – 6 898 W
 - lighting – 1 905 W
- Energy consumed for lighting – 310,4 kWh/week
- Technical energy savings potential – 85,7 kWh/week
- Economical energy savings potential – 56,4 kWh/week (18%)

Example of the saving potential in the town hall (cont.)

Economical energy savings potential:

- Using energy efficient lamps – 56,4 kWh/week (18%)
- Optimisation of the illumination level – 21,9 kWh/week (7,05%)
- Total per week – 78,3 kWh/week (25%)
- Total per year – 2742 kWh/year

Number of the communes with 10-40 000 inhabitants in Poland – 701

Estimated energy saving potential in town halls in small towns – 6660 MWh/year



WASKO Enterprise with venetian blinds