

# GOOD PRACTICES IN SME

## Replacing lighting



*Designed by freepik*

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## Which type of lighting is the most energy efficient?

Type of lighting:

- Incandescent lighting (traditional and halogen lamps)
- Fluorescent lighting (compact, and stick lamps)
- LED (light emitting diodes)

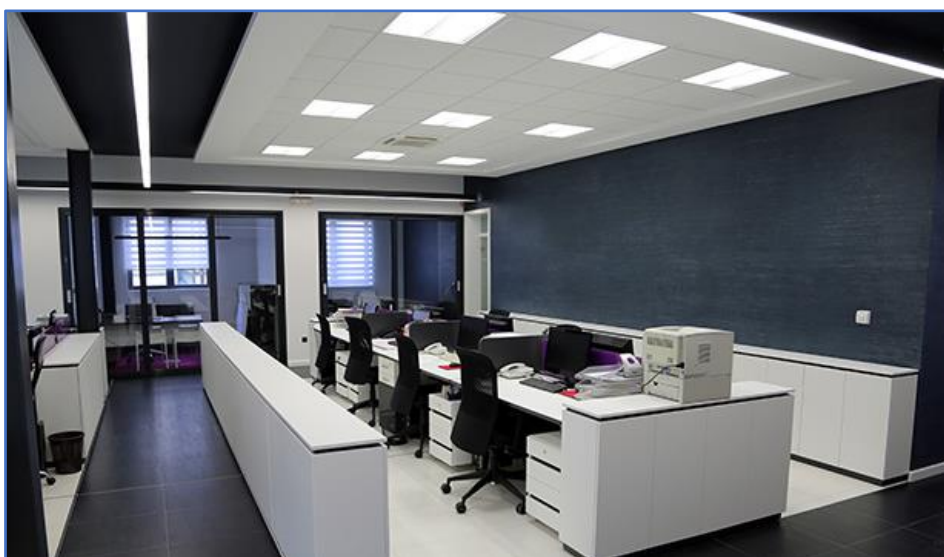
Traditional lightbulbs were once extremely popular due to their low price, however their lighting efficiency is extremely low, as most of the energy is transformed into heat, and only a couple percent into light. They used several times more electricity as their energy-saving counterparts. They were also shorter lived – a traditional lightbulb shined for about 1 000 – 2 000 hours, while compact fluorescent lightbulbs have a lifetime of about 6 000 – 10 000 hours and LED between 10 000 and 50 000 hours. Due to their high energy consumption and the need to decrease CO<sub>2</sub> emissions into the atmosphere the EU successively increases the energy efficiency requirements for lighting, which means that from September 2009 onwards no new incandescent lightbulb can enter the market and no halogen lamp from September 2018.

LED lighting consumes the least energy and uses several times less electricity than other light sources. Moreover, its characterized by the highest lifetime, making replacing existing lighting installations with LED lighting is very cost-effective and has a short return of investment.

When buying an LED lamp, it is important to check if it marked as CE compliant. When the mark is not present or miss formed, it often means the producer did not conduct a correct compliance assessment procedure in accordance with the technical requirements for user safety.



*Pic. 1 CE marking*



*Pic. 2 sowarled*

## How much can be saved using LED lighting?

As an example, let us take an average office with 50 fluorescent 72W lamps. Each fluorescent can be replaced with a 40W LED lamp at a cost of 55,20 PLN/unit. Let us assume an average electricity price of 0,55 PLN/kWh, the office is used about 250 days a year, for 8 hours at a time.

### Cost of LED lamp purchase:

$$50 \text{ units.} \times 55,20 \frac{\text{PLN}}{\text{unit}} = 2\,760 \text{ PLN}$$

### Energy savings:

$$50 \times (72W - 40W) \times 8 \frac{h}{day} \times 250 \frac{days}{year} = 3\,200 \frac{kWh}{year}$$

### Energy cost savings:

$$3\,200 \frac{kWh}{year} \times 0,55 \frac{\text{PLN}}{kWh} = 1\,760 \text{ PLN/year}$$

### Simple payback time:

$$SPBT = \frac{2\,760 \text{ PLN}}{1\,760 \text{ PLN/year}} = 1,6 \text{ years}$$

Source: KAPE

