



## Energy Efficiency Solutions

### Energy saving light bulbs

Installing energy saving light bulbs in your hotel is generally one of the easiest ways to reduce energy bills, as lighting accounts for a large portion of energy use. The use of energy saving light bulbs will reduce your hotel's electricity consumption.

#### What types of energy efficiency lighting exists?

Several types of energy efficiency lighting technology exist, such as compact fluorescent lamps CFL and light-emitting diodes LED in order to replace old incandescent lamps. Your hotel may also consider the installation of high pressure sodium vapour HPSV lamps for use where colour rendering is not critical (for instance, on the outside).

Here are some examples of standard upgrades:

Initial situation	Possible upgrade
Incandescent lamps	Compact fluorescent lamps (CFL) (same light output but with lower Wattage)
T8 fluorescent tubes T8	More energy-efficient T5 fluorescent tubes
Incandescent exit signs	LED exit signs

#### What are incandescent lamps?

Incandescent lamps are standard electric light bulbs that were introduced for hotel use more than 100 years ago. They have the lowest initial cost and good color rendering but they have a short life span and use significantly more electricity than other energy saving light bulbs to produce the same light output. Incandescent technology produces light by heating up a metal filament enclosed within the lamp's glass. More than ninety percent of the energy used by an incandescent light bulb escapes as heat, with less than 10% producing light. The EU has passed measures to phase out incandescent light bulbs for general lighting with the aim to encourage the use and technological development of more energy-efficient lighting alternatives.



### Are CFLs slow to start?

While CFLs don't start at full intensity like incandescent bulbs, nearly all CFLs nowadays turn on instantly and reach full illumination very quickly. Some CFLs are marketed as 'instant on' and have no noticeable warm-up period.

### Do CFLs flicker when they first light?

That happened in earlier CFLs with magnetic ballasts. New CFLs use electronic ballasts, which are faster and provide better comfort for guests and employees compared to conventional old magnetic ballasts.

### What is a ballast?

A ballast is a device that serves to control the flow of power to a fluorescent lamp. Advanced electronic ballasts have replaced many magnetic ballasts of the past in new CFL bulbs and fixtures. Electronic ballasts improve fluorescent energy efficiency even further, eliminate the visible flickering found in older fluorescent technology.

### Are CFLs always cold-feeling and remind hotel guests of office lighting?

Older, standard CFLs do emit a cool light, but today there are CFLs in a complete range of hues, and many CFLs are available that produce exactly the same warm white light as traditional incandescent bulbs. Warm white CFLs, similar in appearance to an incandescent light globe are available for use in hotels guestrooms for example. Cool white CFLs are available for use in areas where a brighter light is required such as hotels bathrooms.

### Is it possible to make a CFL that looks like a normal incandescent lamp?

Yes. CFLs now come in a variety of shapes, sizes and functions.

CFLs are now available with a glass cover that give them a similar appearance to incandescent light globes.

### Will CFLs fit in my hotels light fixtures, candelabra, or recessed lights?

This can still be a problem in certain situations. A CFL is often not an exact size substitute for an existing incandescent bulb, but a far greater range of sizes is available than is generally realized.

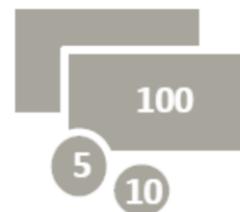
### Do CFLs contain mercury?

Yes, all CFLs contain a very small amount of mercury.

### Doesn't disposal of mercury-based products harm the environment?

Yes, mercury is classified as a hazardous material and CFLs should be recycled instead of being thrown out with the normal trash.

### How expensive are CFLs?



A typical CFL uses around 75-80 percent less electricity and lasts between eight and fifteen times longer than an

incandescent light globe. So, even though CFLs are more expensive than incandescent globes, they will last a lot longer and their lifecycle costs work out more cost effective.

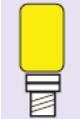




### Which is the indicative return on investment time for CFLs?

Efficient lighting is a high-return, low-risk investment. The typical return on investment ranges from 1 year to 3 years. Since CFLs last much longer than traditional bulbs, labour costs associated with changing light bulbs are reduced. Note that costs and return on investment may vary greatly depending on the local context and on the hotel’s initial situation.

Examples of energy savings are provided below (the effective savings will depend on the equipment efficiency and the hours of operation).

Standard Incandescent	CFL Replacement	% load savings
		
25 Watt	7-9 Watt	64 – 72 %
40 Watt	11-13 Watt	67 – 73 %
60 Watt	15 Watt	75 %
75 Watt	18-20 Watt	73 – 81 %
100 Watt	28-30 Watt	70 – 72 %

Replacement of incandescent bulbs with CFLs  
(Source: U.S. Environmental Protection Agency)

### What is a LED?

LED stands for Light Emitting Diode. LEDs have recently become commercially available as a lighting source. They have extremely long life spans, are energy efficient, and come in a variety of colors. As research continues, LEDs continue to improve and be used in new applications. An increasingly popular hotel use is decorative light. LEDs are now commonly used by hotels in exit signs.

The right investment in the right lighting technology can brighten the hotel industry’s bottom line considerably in the long run, because for each venue the savings per bulb are multiplied by hundreds or thousands of rooms, corridors, public spaces, restaurants and shops. Hotels are rethinking their approach to energy savings, and LEDs are about to become a prudent solution for many.

### What is the cost of LED?

Currently, LED lights cost more than incandescent and fluorescent lights. The good news is that the cost is dropping as the technology is improving.

### How does LED differ from Incandescent bulbs and CFL?

LED is a semiconductor device and produces light by a process known as Electroluminescence. The conventional bulb produces light by Incandescence of Filament and CFL produce light by a process called Fluorescence.

### Why should my hotel change to LED Lights when other energy saving lights are available at much lower prices ?

LEDs do cost much more compared to other energy saving lights. However, your hotel can save up to 70 to 80% on your energy bills by installing LED lighting. Moreover, the life of LEDs is 7 to 10 times more compared to other lights and you save on replacement and maintenance costs. LEDs do not contain any toxic substance like mercury, which is found in CFLs. Further LEDs generate much lesser heat compared to other lightning systems.





### Which is the indicative return on investment time for LEDs?

Even with the relatively high initial investment, even LEDs are now able to show paybacks in the two-to-eight-year range, depending on the application and energy costs. Adding in labor savings, such as not having to replace bulbs and ballasts, can further reduce the payback period. Note that costs and return on investment may vary greatly depending on the local context and on the hotel's initial situation.

### What about halogen lighting?

Halogen Lamps are somewhat more efficient than incandescent lamps, but operate at an even higher lamp temperature. These are mainly used as downlights in hotels. Halogen lights are also a type of incandescent light. Halogens are also known as 'low voltage' lights as they have transformers fitted to convert from the standard 240 volts to 12 volts, but this does not mean that they are low energy users. Halogens are considered an energy intensive lighting option because several halogen lights are often needed in the place of one incandescent or fluorescent light bulb to achieve even lighting levels in a guestroom.

### Does my hotel need to install energy saving light bulbs in order to obtain the EU Eco-label?

Yes. The use of energy saving light bulbs is a mandatory criterion of the EU Eco-label (criterion #9).

### Who can help me choose the right lighting?

When doing lighting changes, identify opportunities with an electrician or lighting specialist.

The first step is to review existing lamps and bulbs in use in the different areas of the hotel (rooms, floor, restaurant, outdoor area, kitchen, back office, etc.) For each of these areas, try to evaluate if it is preferable to install energy saving light bulbs and/or lighting controls (solution n°XI). In case you plan to install an energy saving lamp together with a lighting control, make sure that you choose an energy-efficient lamp that works with the lighting control you plan to use (timing device or motion detector, for instance).

### What are the criteria to consider when choosing an energy-saving light?

Choose equipment that suits your needs: the needs and characteristics of the different hotel areas need to be taken into account. For instance, importance of colour rendering may vary from one place to another. Remember also that lighting levels necessary for each zone are established in the lighting regulations of each country. Attention should also be paid to the switching cycles when you want to install the bulb in frequently used rooms such as bathrooms. When changing from a conventional system to an energy efficient one, be careful that the bulbs match your devices. Prior to undertaking projects, ensure that all lighting changes are in line with your hotel staff workplace guidelines.

### How can I guarantee to buying good quality and efficiency new bulbs?

Choose energy certified products: in some countries, there are product certifications that indicate quality and energy savings, such as the Energy label in Europe (as defined in Commission Directive 98/11/EC). Buying labelled products (e.g. lamps with class A of the EU Energy label) is a good way to be sure of investing in high-performance new equipment.

Topten is a consumer-oriented online search tool, which presents the best appliances in various categories of products: [www.topten.info/](http://www.topten.info/)





## Benefits for the hotel



### Improved image

The use of efficient lighting will improve your environmental image.

## Benefit for the environment

CO<sub>2</sub>

### Carbon emissions reduction

For a 1,000 m<sup>2</sup> hotel with an annual energy consumption of 30 kWh/m<sup>2</sup> of electricity for lighting, and if the French emission factors are applied, a 75% energy saving represents:

**1.90 teq CO<sub>2</sub> avoided each year**

French emission factor for electricity: 84.3 gCO<sub>2</sub> / kWh.

French emission factor for gas: 231 gCO<sub>2</sub> / kWh  
(Source: ADEME).

## Market availability

Maturity of the solution: mature.

### Market trends

- Energy saving light bulbs are increasingly available on the market and in retail stores.
- Note that incandescent lights will be progressively removed from the European market to be replaced by CFL.

### Manufacturers

- Main manufacturers of energy saving lamps and ballasts:
- Philips Lighting [www.lighting.philips.com](http://www.lighting.philips.com),
- OSRAM [www.osram.com](http://www.osram.com), Z
- UMTOBEL [www.zumtobel.com](http://www.zumtobel.com),
- GE Lighting [www.gelighting.com](http://www.gelighting.com).
- ELC (European Lamp Companies Federation) is the European federation of manufacturers. For more information: [www.elcfed.org](http://www.elcfed.org).

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