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A guide to

# energy efficient lighting



SevernWye energy advice



## References

*For details of the references used in this document please scan the QR image, visit **www.warmandwell.co.uk/warm-and-well/advice-materials.html** or call us on **0800 500 30 76**

# How can I save energy and money when lighting my home?

With lighting accounting for around 18% of the electricity used in the average home*[1], choosing energy efficient light bulbs and fittings is one of the simplest ways you can save money. Perhaps the only thing simpler is remembering to turn lights off when they're not needed.

With replacement compact fluorescent lamps (CFLs) costing as little as £2 this is potentially one of the cheapest energy efficiency improvements you can make*[2]. Light-emitting diodes (LEDs) will cost you more, but as the market for these expands they are becoming more affordable, with some basic models now available for as little as £5. Price decreases for LEDs are expected to continue.

Replacing a single 60W traditional light bulb with an equivalent CFL bulb could save as much as £3 per year, offering a relatively quick payback on the cost of buying the bulb*[3]. LEDs use even less energy and therefore can be expected to save more over the year.

This leaflet will show you the various options, and help you understand which bulb is right for you.



# Types of lighting

There are four main types of electric lighting currently found in UK homes:

**Tungsten filament bulb**
Incandescent or traditional bulbs produce light by heating a metal wire (or filament) until it glows. Only around 5% of the energy used is converted to light*[4], making it very inefficient. Due to an EU directive aimed at reducing energy use in lighting, these bulbs have now been phased out, and retailers have stopped stocking them*[5]. However, for most light fittings, you will be able to find alternatives from those listed below.

**Halogen**
These are similar to traditional bulbs, but are designed to work at higher temperatures making them slightly more efficient. Common lighting designs, however, mean that they are often installed in large groups, which will usually result in very high overall energy use. They are often found in kitchens and bathrooms as down lighters.

**Fluorescent**
These consist of gas in a glass tube, which glows when it is charged up. This causes a coating on the tube to give off light. First used in strip lighting, it's now more commonly seen in the form of CFLs, or energy saving bulbs. These are fluorescent tubes bent or folded into a more compact size similar to that of the 'traditional' light fitting designed for incandescent bulbs. They are widely available in a range of shapes, sizes, fitting options and colours. They're relatively cheap to buy and use about a quarter*[6] of the electricity needed by a tungsten bulb. They also last up to 10 times as long*[7], making them a very sustainable lighting choice.

**Light-emitting diodes (LEDs)**
An LED, as the name suggests, emits light as the electricity flows through it. They are extremely efficient, can last up to 50,000 hours and use very little energy. It's now possible to buy LEDs for most light fittings. However, they generally cost more to buy than most other types of bulb. Imitation tungsten bulbs are also now becoming available such as the one shown in the image opposite:



*Imitation tungsten LED*



*LED with GU10 fitting*



*LED with MR16 fitting*

# Replacing halogen spotlights

There are two main spotlight fittings: GU10 and MR16 (see images below).

When upgrading to LEDs, it is recommended that where there are several bulbs together, these are all replaced with LEDs at the same time to avoid having a mixture of halogen and LED bulbs. GU10 bulbs can generally be replaced like for like. However, with MR16 bulbs, there will be a transformer somewhere in the system to lower the voltage. LED suppliers generally recommend changing the transformer for an appropriate LED driver. An alternative would be to remove the transformer and MR16 fitting and replace it with a GU10 fitting. For the latter, it is recommended that you get a qualified electrician to carry out this work.

# Buying the right bulb

If you're buying a new energy-saving bulb to replace a traditional 60W or 100W one, looking for the wattage is no longer an accurate guide to brightness; instead, you should be looking for one with comparable lumens. Lumens measure the brightness of the bulb (the higher the lumens, the brighter a bulb will be) whereas Watts measure the rate at which electrical energy is consumed (the higher the wattage, the quicker the light bulb will consume electricity).

The table below*[8] compares traditional bulbs with their energy saving equivalent and lists the lumen levels you can expect from bulbs in this range.

**Comparison of different lighting types**

| Traditional bulb (Watts) | Energy saving (CFL) bulb (Watts) | LED bulb (Watts) | Lumens |
|---|---|---|---|
| **100** | 20-25 | N/A | 1,300 |
| **75** | 20-23 | 12 | 1,100 |
| **60** | 13-18 | 12 – 14 | 700 - 900 |
| **40** | 9-11 | 8 | 400 - 700 |
| **25** | N/A | 4.5 | 200 - 300 |

**Comparison of different lighting types**
The table below*[9] compares a number of different lighting types to show how they differ in terms of energy use, cost and lifespan.

| | Energy use (Watts) | Cost to operate | Rated avg. life (hours) |
|---|---|---|---|
|  **Traditional/ Tungsten** | 3 – 500 | High | 755-1000 |
|  **Halogen** | 5 – 500 | Medium | 3,000 |
|  **Fluorescent strip light** | 5 – 500 | Medium | 15,000 |
|  **CFL** | 3 – 25 | Low | 10,000 |
|  **LED** | 2.5 – 16 | Low | 45,000 |

Since October 2013 lighting manufacturers have been required to add an EU energy label to light bulb packaging. The labelling has been designed to show information about the energy consumption and performance of bulbs in a clear and understandable format. Those products rated A+ or above will be the most efficient.

# Things to look out for

**Variety**

Over time, energy saving bulbs have developed greatly leading to increasing variety. Modern energy saving bulbs are now available in many shapes, sizes and fittings such as bayonet, Edison screw, MR16 and GU10.

**Quality of light**

The quality of light from energy saving bulbs does vary, but if you look for 'warm white' and 'soft white' bulbs, you will find these give off a quality of light very similar to that of a traditional incandescent bulb. Alternatively, if you are looking for light to do detailed work, try one labelled 'cool white' or 'pure white'.

For those of you wanting a slightly more technical comparison of light quality, some manufacturers also include the colour temperature of the bulb measured in Kelvin. The lower the Kelvin value the warmer the bulb, with warm white equating to about 2,700K and Cool white about 6,000K.

Some people with poor eyesight may struggle to read by the light given off by some CFL bulbs. If so, try buying bulbs with higher lumens or using a reading lamp fitted with an LED, to give focused lighting.

**Dimmers**

Whilst older CFLs weren't compatible with dimmer switches, in recent years energy-saving bulbs have been launched which do enable dimming; look out for this on the box. Many LED lights have been designed to work with dimmer switches; however it might be necessary to replace the switch to allow this*[10].

**Disposal**

- Incandescent bulbs: It is not possible to recycle these, so they must be disposed of in your waste bin
- CFL bulbs: It's very important that these are recycled, as they contain small amounts of Mercury, so preventing contamination of the environment. This is very easy to do, as energy-saving light bulbs are part of the Waste Electrical and Electronic Equipment (WEEE) initiative, so retailers must provide the public with information on how they can be recycled. Facilities are widely available with many supermarkets also accepting them
- LED bulbs: These are accepted through the same recycling facilities as CFLs

You can find out more about recycling light bulbs at **www.recolight.co.uk** – 0845 601 7749.



# Energy saving tips

According to the Energy Saving Trust (EST), the UK wastes £170m each year by leaving lights on*[11]. One factor in this could be the myth that turning lights off and back on again uses more energy than leaving them on. While fluorescent light design means that there is a power surge when they are switched on, this is now so brief that it only amounts to a few seconds of energy use, so if you are leaving a room, make sure you always switch the light off.

Use the right light for the job in hand. If you're watching television, you probably only want low level background lighting, but if you're reading a book you will want something bright and focussed.

**Here are a few more tips to help:**

- Keep your windows clean inside and out to let light in.
- Reduce external obstructions such as overgrown bushes to maximise light coming in.
- Move furniture so that it is positioned to make the most of the light coming in from windows.
- Move wardrobes and other tall furniture away from windows where they funnel light into the centre of the room, leaving corners in shadow.
- Opt for light colours on walls and ceilings when you redecorate; this will reflect light around the room and make the room seem brighter.
- Paint window frames and sills white to help reflect light inwards.
- Use a longer curtain track or pole with tie backs to keep windows clear when curtains are open.
- Try placing mirrors in different rooms to reflect light around.
- Use more transparent shades or fittings to maximise the light without the need for a brighter bulb.
- If you have external lights, use a sensor that turns them on when someone approaches so they are only on when needed.

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