LED LIGHTING: A BEGINNER'S GUIDE (2016)

LED lighting, replacing old-style bulbs, will immediately start saving you a lot of money and will carry on saving you a lot of money every year. You probably spend £10-15/ year in electricity running a single old-style (halogen) bulb for a few hours a day, and the bulb needs replacing every couple of years. An LED equivalent costs only £1/year to run, and the bulb can last for 20 years. Do the sums:

	Bulb cost	Watts	Electricity p.a. per bulb*	Total cost over 10 years*
Old-style	£2	35-70	c.£10-15	**c.£150 PER BULB**
LED	£4-7	3-5	c.£1	**c.£15 PER BULB**

** Rough figure, @ 4-5 hours/ day @ 15p/ kw/hour (typical cost)*

← Got these old-style lightbulbs?
Replacing them with an LED version is likely to save you c.£10/ year per lightbulb.

CFLs – odd-shaped tubular bulbs – → came in to replace the original bulbs. They were lowish-energy (say 15 watts). They gave low-energy bulbs a bit of a bad name as they took a while to light up and tended to fade after a couple of years; now they're almost extinct. Don't buy them!

A history of lightbulbs – and why LED

Lightbulbs used to be consumables – they burnt out after a year or two, and you kept a box of replacements in a cupboard. But they were cheap – or were they? A single 100w bulb used for 4 hours a day (at a typical energy company's 15p/kwh) costs **£22/year** to run, or a single halogen 50w downlighter **£11/year**; so multiply that by the number of lightbulbs in your house.... Several £100/ year, perhaps…?

The early **LED lights** gained a reputation for being feeble, but the latest LED lights are delivering a huge amount more light for rapidly-reducing cost; and **they flick on immediately**, unlike CFLs. **'Lumens'** is the magic word – it's a measure for brightness; **'watts'** only indicates how much electricity you're using. Now when choosing any lighting, check the lumens (e.g. an old 100w bulb emitted about 1300 lumens) and buy bright lights. Brighter may cost a bit more – you get just what you pay for. **An LED lightbulb can last for 20 years or more**, so there's an end to the boxes of

replacement bulbs – and to all that messy wrestling with downlighter bulbs when they blow, as the halogens constantly do.

Another minus for early LEDs was their very cool, bright light; but now LED lights come in a **wide range of warm effects**. See pages 4-5 below for some comparison photos.

LED lightbulbs **fit into almost all types of fitting – bayonet, screw etc**. Way back, LEDs were only for downlighters (the **GU10s** that you see in ceilings); but now there are nice-looking LED lights to replace all your lightbulbs. The prices are coming down rapidly, and the styles improving exponentially; so for all your lightbulbs there's now **overwhelming economic sense in switching to LED**.

So now, **lightbulbs are an investment**, like a light-fitting, not a throwaway item. And don't forget, if you're renting or planning on moving house, that you can take your lightbulbs with you (replacing them on leaving with the old ones). Have a look at the cost calculations: **the sooner you switch to LED the faster you'll be making savings**. For all the lights that you use regularly, it's totally not worth hanging on till the bulbs fail….

Comparisons:

April 2016 – NB LED prices are falling	**Bulb cost**	**Est. years of life**	**Watts (electricity used)**	**Lumens (brightness)**
GU10 halogen	av. £2	2	30-50	200-430
GU10 **LED**	£4-5	10-15	4-6	200-430
Bayonet halogen	£2	2	av.75	c.1200
Bayonet **LED***	£6-12	av. 15	5-15	700-1500

* *Range of strengths*

Note: these are from a check of bulbs on sale in Lewes Homebase, Tesco and EFT (see below); there are many deals online

One point to note for downlighters is the **GU5.3** thin-pin bulb, which is still found in older and low-cost downlighter installations: at the moment this does have to be converted to GU10 by an electrician as it has a transformer. Don't be put off if your traditional electrician is gloomy: it's generally straightforward – see page 6 below for an explanation. It's worthwhile financially!

GU10 – fine

GU5.3 – convert

See over for a summary of **factors when thinking about buying lightbulbs**, and some **local and online suppliers of LED lightbulbs**.

BUYING LED LIGHTBULBS

The fitting	The light
• Do you know the name of your base type? • Is it a narrow or difficult-shaped fitting/ shade? • Is it on a dimmer switch? • How important is the bulb appearance?	• How bright a light do you need? • Do you want a clear working light or something more warm and atmospheric? • Do you want a broad or narrow beam?

HERE ARE THE FACTORS RELATING TO YOUR LIGHT-FITTING

Base type	It's important to know the name of your light fitting base type, e.g. E27 is a standard screw fitting, B22d is a standard bayonet fitting, GU10 is a 'downlighter' fitting with two thick T-shaped prongs, GU4 is tiny with thin prongs
Bulb/ case dimensions	LED bulbs are much less bulky now, but a few are still too fat for particular light-fittings, so check visually and then try measuring before opening the pack
Dimmer-switches	Some LED bulbs are not suitable for use with dimmer switches – check, if that's what you want them for
Aesthetics	LED bulbs sometimes look a bit different from the old-style ones; but look around, as there's a huge range now and better-looking bulbs are coming out all the time

HERE ARE THE OPTIONS FOR THE LIGHT THAT YOU WANT

Brightness	Lumens are the new watts. Direct comparison is tricky, but get maximum lumens for brightness. Very roughly, the old incandescent 40w bulb gave out c.400 lumens, 60w c.750 lumens, 100w c.1300 lumens
Light tone/ colour temperature	Lightbulbs are graded by colour temperature (CCT), in K values; incandescent bulbs' yellowish colour is K2700-3000, cooler colours are a higher K value. LED and CFL bulbs are generally summarised as being: ➢ soft/warmlight, K3000 (less blue, more like incandescent; less bright) ➢ cool/daylight, K5000 (good for office/ workspace; more outdoors feel; brighter) Check the K value generally, as lighting tones are improving all the time
Breadth of beam	Low-energy bulbs come with a range of angles of beam, like the old spotlight vs normal bulb. Choose what angle you need, e.g. widebeam (120 degrees, lighting a wide area), medium (45 degrees), narrow (25 degrees)

Local shops in Lewes	With no guarantees, here are some websites (2016) offering a range of LED lightbulbs	
EFT Electrical, an independent specialist electrical shop in Lewes, sell LED bulbs and offer expert advice and demonstrations – (www.eft-electrical.com); down Brooks Lane past Homebase, R at the T-junction, at the end on the L Homebase also now sell a wide range of LED bulbs, with some good offers	www.homewatt.co.uk * www.ledcentre.uk.com * www.ledhut.co.uk * www.lustrumlight.co.uk ** www.simplyled.co.uk ** www.megamanuk.com **	http://brightonledlighting.com www.energylightbulbs.co.uk www.ledbulbs.co.uk * I've used these ** recommended by a colleague

COOL AND WARM LED LIGHTING SHADES

Information kindly provided by Neil Williams (2013).

LEDs come as 'cool' and 'warm', though there is an increasing spectrum in between. Cool is a very blueish light, unlike other lightbulbs, and has been described as cold and akin to moonlight. Many find it a bit off-putting, although some like its clear white light. The most common choice is 'warm', which more closely matches halogens and seems more pleasant to live with.

The packaging is usually pretty indicative, with 'cool' being described as having a colour temperature of 6000K, whilst 'warm' is 2700-3000K. However, here I have to give a warning about colour, as not all 'warm' bulbs are the same (see Fig.1). As you will see, all those I found were generally acceptable, but one had a distinctly greenish yellow tone, which I didn't like. The best also happened to be the cheapest, so price is no indicator of quality.

Fig.1 Comparison of different coloured 'warms' in kitchen setting

To try and give some guidance, I bought a selection of various LEDs I could find in the Lewes area and have compared the light from each. If you look at the photos overleaf you will see what I mean. Although photos never represent colour perfectly, these give some idea.

WARM LED COLOUR VARIATIONS:

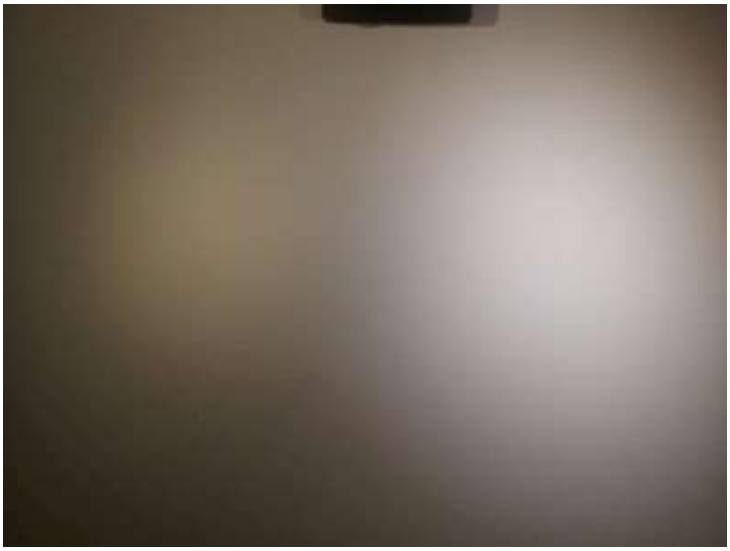

Fig.2 Modo vs Homebase

Fig.3 Tesco vs SETS

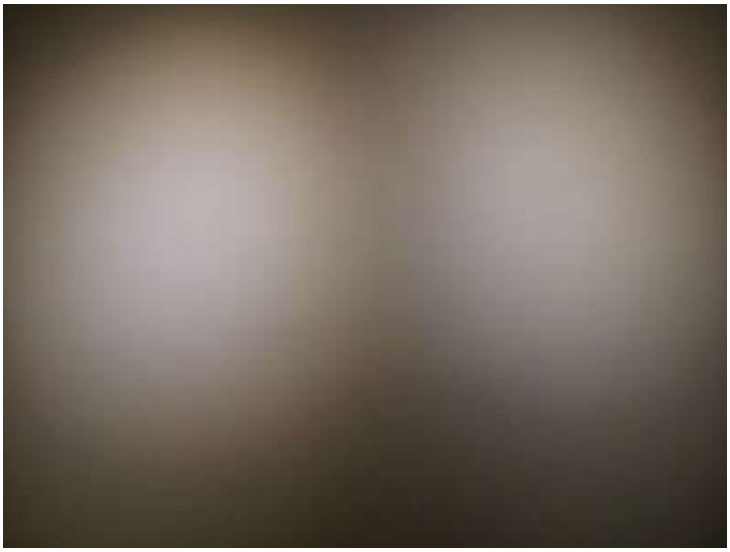

Fig.4 B&Q vs Homebase

WHAT TO DO IF YOU HAVE GU5.3 DOWNLIGHTER BULBS

Information kindly provided by Neil Williams (2013).

Recessed halogen downlighters come in two main fittings:

- **GU10** is now the fitting that all commonly-available downlighters use (see Fig.1). If you have GU10, you can just go out and buy LEDs without any need for modification and swap like for like
- **GU5.3** was the norm for some older downlighters and has two small pin connectors (see Fig.2). It is low-voltage and so each fitting has a transformer to link it to mains voltage

Fig.1 GU10 – fine

Fig.2 GU5.3 – convert

If you have GU5.3 you have two options. Firstly, it is possible to find low-voltage GU5.3-compatible LEDs on the internet, but choice is limited. Also my electrician informs me they have half the lifespan of normal mains-fed GU10s.

Alternatively, the existing fitting can be converted to GU10 relatively easily. For safety's sake, it is probably best to ask an electrician, but it isn't expensive:

- The transformer(s) need to be removed
- The terminal inside the fitting needs to be replaced with a GU10 socket

To give an idea of cost, my electrician converted nine fittings for me and charged about £10 each. Each fitting took about five minutes to do (see Fig. 3).

Fig.3 Downlighter converted to GU10