Energy Efficient Lighting
A Cost comparison

INSPIRED LIGHTING

Historically, lighting has accounted for just under 3% of the annual overall energy use in homes, and was not viewed as a priority for energy efficiency measures or initiatives. Once the emphasis shifted to addressing carbon emissions, lighting, with its dependence on grid electricity (with relatively high emissions per kW generated) became a significant consideration for Government. Since 2000, a number of drivers, including national and international legislation, together with standards, such as the Code for Sustainable Homes, have stimulated innovation in low energy lighting technology, and its adoption in new and existing homes. Compact fluorescent lamps (CFLs) and halogen incandescent lamps initially offered the main alternatives to traditional tungsten incandescent bulbs, which were phased out from 2009. However, it is LED (Light emitting diode) technology that seems set to truly revolutionise the energy efficiency of lighting.

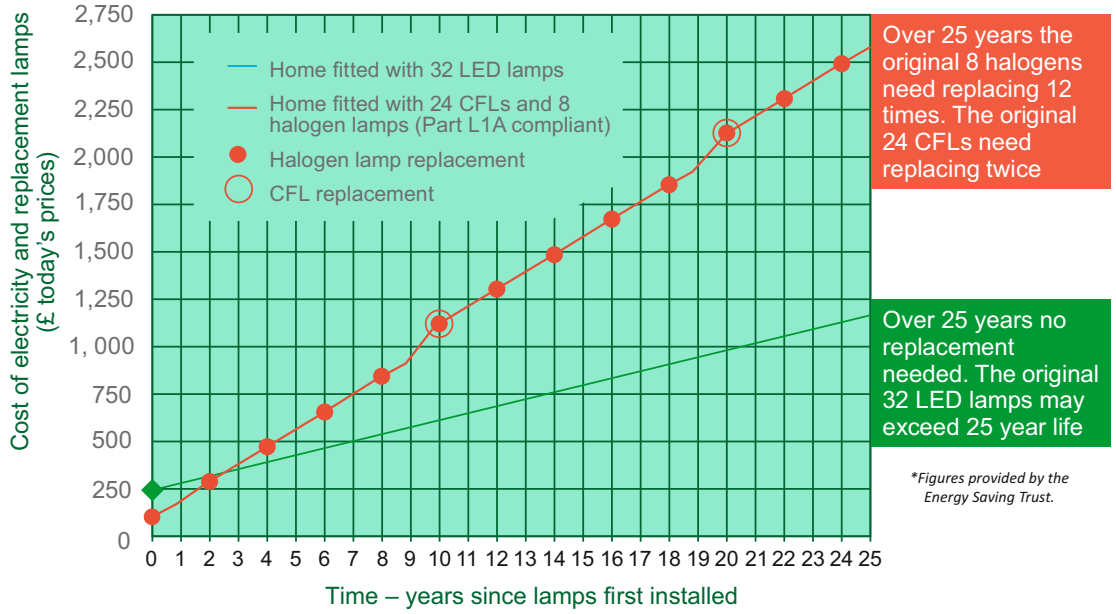
With LED lighting, the speed and magnitude of change is quite remarkable. The traditional incandescent light bulb, which offered about 12 lumens per watt and a life of about 1,000 hours, can now be replaced by an LED lamp with an output exceeding 100 lumens per watt and potentially 35,000 hours of use or more. In addition, LEDs have been adapted to overcome their earlier limitations: they can now provide a range of colour temperatures to create ambience, many are fully dimmable and a range of beam angles are available to tailor light distribution. The critical change over the last eighteen months has been on affordability; good quality lamps are now available for under £6, often less than half the price they were a year ago.

Cost of low energy lighting for individual lamps.

	LED	CFL	Halogen
Watts (equivalent lamps)	6W	11W	35W
Purchase price per lamp	£6.00	£3.50	£2.00
Typical annual lamp use (hours)	1,000h	1,000h	1,000h
Typical lamp lifetime (in hours)	30,000h	10,000h	2,000h
Typical lamp lifetime (years)	30 years	10 years	2 years
Cost of lamp purchases over 30,000 hours/30 years	£6.00	£10.50	£30.00
Annual energy consumption per lamp	6kW	11kW	35kW
Annual electricity cost per lamp at 14.05/kW	£0.84	£1.55	£4.92
Total cost per lamp per year (averaged over a typical LED lamp life – 30 years)	**£1.04** per year	**£1.90** per year	**£5.92** per year

Table 1 (for individual lamps) and Table 2 (for a typical home) highlight the benefits of specifying LED lighting. It is clear that halogen lighting is expensive to operate and lamps will need to be replaced frequently. CFLs offer a significant additional energy saving and will typically last for over 10 years. LEDs offer the dual benefit of very low energy consumption and a long lamp life of up to 30 years.

Cost of low energy lighting in a typical home with 32 lamps



*Figures provided by the Energy Saving Trust.

Cost of low energy lighting in a typical home with 32 lamps. Cumulative costs of 100% LED lighting compared with a Part L1A compliant solution (75% of fittings using CFLs and 25% of fittings using halogen lamps).

Replacement intervals:
Halogen = 2 years,
CFL = 10 years,
LED = 25 years+.

Cost of electricity = 14.05p per kWh. Equivalent lamp. output specifications.

Single-lamp fittings throughout.