



## The phasing out of incandescent light bulbs

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In December 2008 it was agreed by EU Member States that energy intensive incandescent bulbs would begin to be phased out from 1 September 2009. The former Labour Government led a voluntary initiative with retailers in the UK to begin this phase-out early and to replace these bulbs with energy efficient light bulbs such as Compact Fluorescent Lamps (CFLs). CFLs are up to 80% more efficient than incandescent lamps.

Some people who suffer from light sensitivity can react to the UV emitted by fluorescent light bulbs, including CFLs. Some sufferers from light-sensitive versions of lupus, epilepsy and migraines have complained that their condition is worsened by either ultra violet emissions in the case of lupus sufferers, or flickering in the case of epilepsy and migraine sufferers. A preliminary study from the Health Protection Agency (HPA) has found that UV emissions from CFLs may exceed recommended levels when the bulbs are at close proximity to the skin (for example in desk lights). The HPA recommends that people suffering from light based sensitivities should be "cautious" about the use of CFLs.

Another concern with CFLs has been over the levels of mercury that they contain. The mercury levels are however, very small and are limited at 5mg per lamp. At such levels, the Department for Environment, Food and Rural Affairs (Defra) has said it is unlikely to cause harm even if the lamp should be broken. CFLs are now subject to the requirements of the Waste Electrical and Electronic Equipment (WEEE) Regulations. CFLs must be disposed of properly and many local authorities have designated collection facilities where the bulbs can be returned and the mercury recovered safely.

This note sets out in more detail the phasing out of traditional incandescent light bulbs and the claims that low energy light bulbs are damaging to human health and to the environment. For further information see:

- Defra website, [Energy saving light bulbs](#) [23 June 2010]
- Energy Saving Trust website, [Energy saving light bulbs take over](#) [23 June 2010]
- Parliamentary Office of Science and Technology Note, [Lighting Technology](#), Jan 2010

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## 1 The phasing-out of traditional light bulbs

Traditional light bulbs - incandescent lamps that work by heating a tungsten filament - will be completely phased out over the next few years in favour of low energy bulbs. The new, low energy bulbs, are overwhelmingly Compact Fluorescent Lamps (CFLs); small versions of the strip lights used for decades in schools, kitchens and garages. Other technologies, such as light emitting diodes and low energy halogen bulbs, are under development.

The Labour Government made voluntary agreement with retailers to end their sale by 2011. Hilary Benn, the then Secretary of State for Environment, Food and Rural Affairs, announced on 27 September 2007 that retailers had agreed to phase out traditional bulbs from shops before the final ban agreed at EU level (see below). Mr Benn said:

Britain is leading the way in getting rid of energy-guzzling light bulbs and helping consumers reduce their carbon footprint. Choosing energy saving light bulbs can help tackle climate change, and also cut household bills, with each bulb saving up to £60 over its lifetime.<sup>1</sup>

Commenting on the initiative, Kevin Hawkins of the British Retail Consortium said:

We look forward to working closely with Government and manufacturers in the lead up to the 2011 deadline to ensure the supply of energy saving light bulbs matches demand, and that they become a viable alternative to conventional light bulbs for consumers of all incomes.<sup>2</sup>

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<sup>1</sup> DEFRA press notice, [Energy guzzling lightbulbs phase out to start next year](#), 27 September 2007

<sup>2</sup> Ibid

The timetable for phasing out bulbs is arranged according to wattage and is set out in the following table:

Type of light bulb	Date participating retailers will stop selling them
75-100W A-shaped	Jan 2009
60W A-shaped	Jan 2010
40W A-shaped	Jan 2011
60W golfball-shaped and candle-shaped	Jan 2011

Source: Energy Saving Trust

## 2 EU law

On 18 March 2009, EU member states passed a regulation setting out the timetable for phasing out the sale of incandescent light bulbs,<sup>3</sup> with the phase-out to start in 2009 and finish in 2012. Further tightening of requirements would continue until 2016. The timetable for ending the sale of lamps is set out in the table from the Energy Saving Trust:

Stage	Date	Main result
1	1 September 2009	<ul style="list-style-type: none"> <li>• Clear lamps equivalent to 100W incandescent lamps, or above, must be minimum C class.</li> <li>• Non-clear (frosted / pearl) lamps must be minimum A-class.</li> <li>• Introduction of functionality requirements on lamps.</li> </ul>
2	1 September 2010	<ul style="list-style-type: none"> <li>• Phase-out of 75 W clear incandescent lamps.</li> <li>• Introduction of information requirements.</li> </ul>
3	1 September 2011	<ul style="list-style-type: none"> <li>• Phase-out of 60 W clear incandescent lamps.</li> </ul>
4	1 September 2012	<ul style="list-style-type: none"> <li>• Phase out of all remaining clear incandescent lamps (i.e. 40W and 25W).</li> </ul>
5	1 September 2013	<ul style="list-style-type: none"> <li>• Enhanced functionality requirements.</li> </ul>
6	1 September 2016	<ul style="list-style-type: none"> <li>• Raising the minimum level to B class for clear retrofit lamps (i.e. phasing out C-class retrofit halogen lamps).</li> </ul>

Efficient halogen lamps, with between 25% and 50% energy savings in relation to incandescent bulbs, will still be permitted. Spot lamps will not be regulated until a further implementing measure is agreed later in 2010.

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<sup>3</sup> [Commission Regulation \(EC\) 244/2009](#) of 18 March 2009, OJL 76/3, 24 March 2009

### 3 VAT

There have been calls for a reduction in the rate of value added tax on energy saving light bulbs. The then Financial Secretary for the Treasury, Jane Kennedy, gave the following information in response to a Parliamentary Question in July 2008:

The availability of VAT reduced rates is governed by the European VAT agreements, signed by successive Governments. The Government are currently making the case at EU level for wider application of reduced VAT rates to energy-saving and energy efficient products. In March 2008 the European Council invited the Commission to examine areas where economic instruments, including VAT rates, can have a role to play to increase the use of energy-efficient goods and energy-saving materials. This work is currently under way and we expect it to be discussed by member states later in the year. Decisions on the scope of any new reduced VAT rate would be a matter for unanimous agreement of all member states.<sup>4</sup>

### 4 Light-related health concerns

Some people who suffer from light sensitivity can react to the UV emitted by fluorescent light bulbs, including compact fluorescent lamps (CFLs). Some sufferers from light-sensitive versions of lupus, epilepsy and migraines have complained that their condition is worsened by either ultra violet emissions in the case of lupus sufferers, or flickering in the case of epilepsy and migraine sufferers.

An assessment of the scientific evidence relating to these health claims was set out in a recent note by the Parliamentary of Science and Technology (POST):

#### Ultraviolet Exposure

All fluorescent lamps convert UV light to visible light. Groups representing photosensitive individuals are concerned that CFLs have the potential to exacerbate certain skin conditions. Preliminary studies by the HPA and the University of Dundee concluded that UV emissions from CFLs could exceed recommended levels at close proximity to the skin (for example in desk lights). **This is considered unlikely to pose a risk to the general population, but could potentially be harmful to those suffering from conditions such as chronic actinic dermatitis and lupus.** Both studies found that the use of “incandescent look-a-like” CFLs that contain an extra glass coating would mitigate this risk, an opinion endorsed by a European Commission scientific committee. The HPA advises that standard CFLs should not be used in close proximity (less than 30 cm) for more than one hour per day.

#### Flicker

Flickering lighting is linked with conditions including eyestrain and headaches. Incandescent bulbs do not flicker significantly, whereas discharge, fluorescent and LED lamps require electronics to suppress flicker. Preliminary research by the HPA has indicated that significant numbers of CFLs flicker, potentially leading to adverse effects.<sup>5</sup>

The Health and Safety Executive has published the following advice on the use of CFLs:

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<sup>4</sup> HC Deb 7 July 2008, 1266W

<sup>5</sup> POSTnote, [Lighting Technology](#), Number 351, January 2010

In a limited number of circumstances UV exposure from CFLs can exceed guideline levels. CFLs should not be used in close proximity (distances of less than 30 cm or one foot) to people for longer than one hour.

The risks from CFLs can be reduced to a safe level by:

- moving the CFL away from people to a safe distance (>30 cm or 1 foot),
- shading the bulb either physically to direct the UV light away from the user or with a filter to stop UV emissions, or
- using a double-encapsulated bulb.<sup>6</sup>

The Health Protection Agency also gives similar advice. It states:

People who suffer from Lupus and other light sensitive conditions may be specifically affected by the emissions from compact fluorescent lights. They have to be very careful about their exposure to sunlight, so also need to be cautious about their use of compact fluorescent lights.<sup>7</sup>

Double-encapsulated bulbs are now widely available at similar prices to the single-skinned bulbs. These cut out virtually all UV emissions.

The Energy Saving Trust website provides useful information different types of energy saving light bulbs, including alternatives to CFLs, such as LED lighting.<sup>8</sup>

## 5 Concerns about mercury

Each low energy light bulb contains a maximum, in the EU, of 5 milligrams of mercury, which is toxic. It is a very small amount, however, and does not present a health problem in normal use. One toxicologist said that it would be necessary to break 5 of the bulbs in a small unventilated room to be exposed to a 'short term danger'.<sup>9</sup> They should not be disposed of along with normal household waste, though, since the mercury they contain could be released into the environment from land-fill disposal.

One of the points raised by objectors has been that the European Parliament has recently passed a piece of European legislation banning the manufacture of mercury barometers, while at the same imposing energy saving light bulbs that also contain mercury.<sup>10</sup> A typical barometer contains between 100 and 600 grams of mercury, which is between 20,000 and 120,000 times as much mercury as the average CFL.<sup>11</sup> Barometers (and thermometers and other instruments) therefore pose more of a direct health risk than from the mercury in a light bulb is minimal.

All retailers have to provide return and re-cycling facilities for CFLs. In 2009 Jane Kennedy, the then minister at the Department for the Environment, Food and Rural Affairs, made the following statement on disposal:

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<sup>6</sup> HSE website, [Ultraviolet exposure from general workplace light sources](#) [on 23 June 2010]

<sup>7</sup> Health Protection Agency website, [Precautionary advice: Energy saving compact fluorescent lights](#) [on 23 June 2010]

<sup>8</sup> Energy Saving Trust website, [Energy Saving Lightbulbs](#) [on 23 June 2010]

<sup>9</sup> *BBC news Online*, [Low-energy bulb disposal warning](#) 5 January 2008

<sup>10</sup> European Parliament [legislative resolution of 10 July 2007](#) on measuring devices containing mercury (5665/1/2007)

<sup>11</sup> HL Deb c13-4WA, 17 July 2007

Certain types of lighting fall within the scope of the Waste Electrical and Electronic Equipment (WEEE) Regulations. These include the most common type of energy saving light bulbs: Compact Fluorescent Lamps (CFLs). A list of designated collection facilities which take back CFLs and other types of waste electrical and electronic equipment is available at: <http://www.valpak.co.uk/dts/page1734la.aspx>. Retailers have a responsibility to tell their customers where they can take waste CFLs. Some retailers take back CFLs when they sell customers a new bulb. Under the WEEE Regulations, producers (manufacturers or importers) fund the treatment and recycling of equipment once it becomes waste. The regulations require that mercury is removed from CFLs and that at least 80 per cent. by weight of the materials be recycled or recovered. The producer responsibility requirements of the WEEE regulations have been in force since 1 July 2007. We are not aware of specific facilities for disposal of incandescent bulbs.<sup>12</sup>

Some people have expressed concern that safe disposal regulations will not be followed and the bulbs will end up being disposed of along with normal rubbish, releasing appreciable amounts of mercury into the environment. Environmental groups argue that by saving on polluting electricity generation, particularly from coal-fired stations which emit small amounts of mercury, the bulbs will probably mean that less mercury will enter the atmosphere overall.<sup>13</sup>

## **6 How many low energy bulbs are in use?**

It is not easy to access recent figures on the number of low energy light bulbs in use. Total sales of low energy light bulbs reached £43 million in 2008, up from £41 million from 2007 and up from £10 million in 1999.<sup>14</sup>

There are some 600 million lamps in the UK and this number is expected to increase to 750 million by 2020 as the increases in the number of dwellings and changes in lighting styles both drive up demand. CFLs (only) make up almost 5% of sales and 10% of the lamp stock.<sup>15</sup> The stock of CFL light bulbs is higher than sales at present due to the much longer lifetime of energy efficient bulbs.

There are anecdotal reports that sales and giveaways have taken off in the past year. Tesco supermarkets were reported to have a special offer of 5 bulbs for 40 pence at the end of 2008 and the company reported that it had sold 3.5 million low energy bulbs in October alone.<sup>16</sup> There have been free offers too, with *The Sun* newspaper and Southern Electric plc together giving away 4.5 million bulbs in January 2009.<sup>17</sup>

The Carbon Emissions Reduction Target scheme commenced in April 2008 and low energy light bulbs are distributed as part of this initiative. 152.6 million compact fluorescent light bulbs were issued in the period April 2008 to March 2009.<sup>18</sup>

## **7 How much carbon dioxide will they save?**

(Statistical information contributed by Paul Bolton, Social and General Statistics)

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<sup>12</sup> HC Deb c329-30W, 27 January 2009

<sup>13</sup> Greenpeace website, *CFL bulbs: the myths* [on 23 June 2010]

<sup>14</sup> The Co-Operative, *Ten Years of Ethical Consumerism: 1999-2008*, 2009, p4

<sup>15</sup> Defra, *Policy Brief: Improving the energy performance of domestic lighting products*, July 2008.

<sup>16</sup> Tenbees, *Brits switching on to energy saving lightbulbs*, 6 November 2008

<sup>17</sup> 'Gordon goes green', *Sun*, 18 January 2009

<sup>18</sup> HC Deb, 12 October 2009 [c480W](#)

As energy-saving bulbs use only 20% of the electricity of traditional bulbs and lighting consumes a significant amount of electricity, the savings in cash and emissions can be substantial. The Energy Saving Trust calculates that a home with 15 light bulbs would save about £45 a year by installing the new bulbs.<sup>19</sup>

In answer to a PQ in January 2009 it was stated that if only CFLs were used in households, the estimated total reduction in emissions of carbon dioxide would be just less than 3 million tonnes of carbon dioxide per year, some 2 per cent. of the total carbon dioxide emissions from UK households in 2006.<sup>20</sup> Earlier written answers had given a figure of around 5 million tonnes of carbon dioxide and this figure has been widely quoted. The difference could be due to differing definitions of low energy bulbs and timescales. The Government's Market Transformation Programme, a body that provides evidence to the Government on energy-using products, produces reports that give some detail of alternative future scenarios: the difference between their reference (do nothing) situation and best feasible outcome for installing low energy bulbs is 3.5 million tonnes of carbon dioxide saved in 2011.<sup>21</sup>

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<sup>19</sup> Energy Saving Trust website [Energy saving light bulbs take over](#) [on 23 June 2010]

<sup>20</sup> HC Deb c312W, 26 January 2009

<sup>21</sup> Market Transformation Programme, Product strategies, [Domestic lighting](#)