Low energy lighting for businesses

Our **Keep The Heat In** campaign is funded by the Scottish Government's Climate Challenge Fund and aims to help businesses in the Highlands **save energy**, **reduce costs** and **lower carbon pollution**.

Businesses can use a lot of energy for lighting. Premises need to be well-lit to either display goods or meet safety requirements and light is **needed all day**, **every day of the year**. This means that lighting can account for almost all of the on-site electricity consumption in some business premises; lighting is responsible for an average of **25% of electricity use across all UK businesses** (The Carbon Trust).

There are three key reasons why all businesses should prioritise improvements to inefficient lighting

1) Environmental benefits

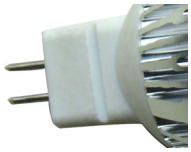
Energy efficient lighting reduces carbon pollution by using **up to 90% less electricity** and waste is reduced as the bulbs usually have a significantly **longer working life**.

2) Operational benefits

Not only is low-energy lighting a visual demonstration of active energy reduction, but it also **reduces maintenance costs** and potentially improves productivity.

3) Financial benefits

Inefficient lighting can make up the **majority of onsite electricity costs** and any investment in upgrades will have a **predictable return**.



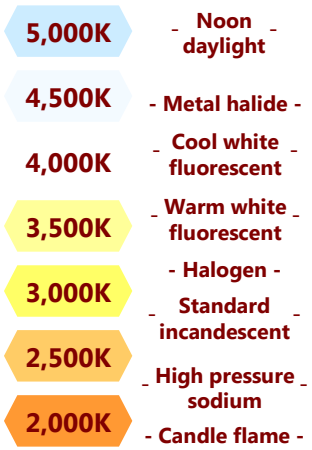
What to consider when upgrading to low-energy lamps

Choose the right replacement... There is a low-energy substitute for almost every lamp, but it may take some research to find it.

Fitting... It's important to check what fitting you need for your lamp (e.g. standard bayonet, small Edison screw, MR16, GU10).

Lumens... Light output is measured in lumens, so make sure the replacement bulb you select gives out an equivalent level of light.

Colour temperature... Light comes out in slightly different hues, which means that it is important to check colour temperature (K).



Upgrading inefficient fluorescent lamps

Most light fixtures in business premises tend to use fluorescent tubes, which come in **T5**, **T8** or **T12** sizes (the number means eighths of an inch, so a T8 is one inch in diameter). The **smaller diameter lamps use less electricity** but give out the same level of light. It is relatively straightforward to substitute a T12 tube for a T8, but **T5 lamps are the most efficient** and their cost is coming down. Modern T5 tubes consume around **20% less** electricity than T12 and last longer. Ultimately, the options for upgrading fluorescents are very much site dependent, but an **upgrade of the fittings** is necessary in almost all cases. Maclean Electrical in Dingwall and City Electrical Factors in Inverness can provide guidance to businesses on low-energy lighting.

Is it better to leave a fluorescent on rather than switching it on and off a lot?

A **small amount of extra energy** is used to turn on a fluorescent lamp and **starter units have a limited lifespan**. However, if you are going to be out of the room for **at least a couple of minutes** then turning the lights off will definitely be worthwhile from the point of view of financial savings.

Worried about mercury in fluorescent lamps?

Fluorescent lamps contain a **very small quantity** of toxic mercury (a tiny fraction of that within a thermometer or barometer), which **cannot escape** from an intact tube. DEFRA advise that the tiny amount of mercury released when a lamp breaks is **unlikely to cause harm**, but care should be taken when clearing up breakages. Generally, the environmental benefit from the reduced energy use outweighs the environmental damage from the mercury.

www.foe-invernessandross.org.uk

Upgrading incandescent lamps

If you have any of the traditional, incandescent bulbs in your premises, then you are wasting energy and money by using a 100 year old technology. **Compact fluorescent lamps** (CFLs) are available in all styles and shapes (e.g. candle, spiral), costing as little as **£2** each.

LED lamp with GU10 fitting

Upgrading halogen spotlights

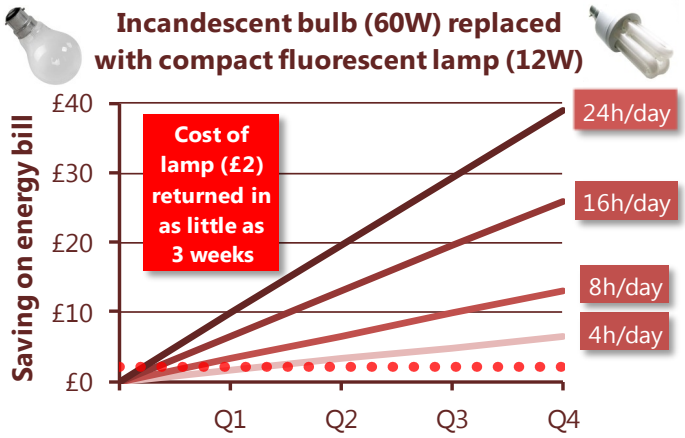
Halogen lighting is inefficient and the displays tend to be overlit. Low-energy replacements include **LEDs and CFLs**, which are becoming more common in shops and offices. Substitutes are expensive: **a CFL spotlight costs ~£8** and **a LED spotlight costs ~£12**. In fact, LEDs are well suited to lighting **display cabinets**. Take power factor into account when estimating savings - CFLs and LEDs will be converting 60 -90% of energy usage into light.

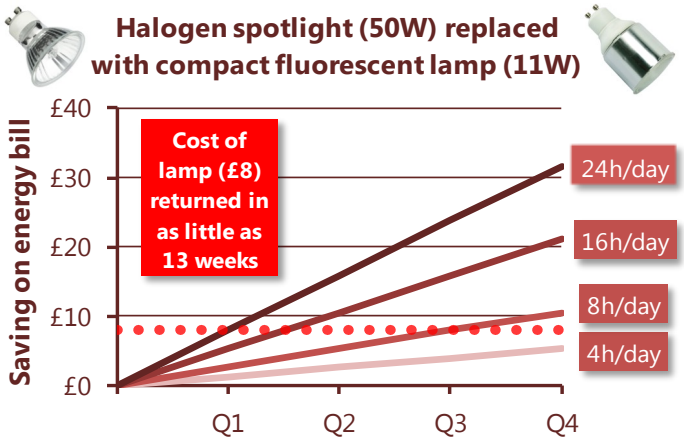
Dimmable lighting circuits

Dimmable lights are commonly found in businesses. Unfortunately, dimmable low-energy bulbs are **more expensive**. A dimmable bayonet cap CFL costs ~£9, a dimmable GU10 CFL costs ~£12 and a dimmable LED costs ~£15. They are still a **worthwhile investment**, but it may be more cost effective to remove the resistor and install zonal controls.

How much money will switching to a low-energy bulb save?

Although an investment in low-energy lighting has a **predictable payback**, it's hard to say exactly how much you could save because there are **many variables** involved in the calculation (e.g. costs of replacement lamps and electricity price). A key factor is how long the lamp is on for and so we have put together two diagrams to give an idea of how the savings vary according to daily use. Upgrading one **incandescent lamp to a CFL** will save **up to £39 a year** and swapping a single **halogen spotlight for a CFL** will save **up to £32 a year**. When you consider all the bulbs you have, the savings could really begin to add up. Don't forget that low-energy lighting upgrades could be financed through low-interest loans available via government agencies.





Assumptions: electricity price of 13p/kWh, with 0% rate of inflation; lamp on for 5 days a week, 52 weeks a year; lamp lifetimes >1 year

Reducing use of your existing lighting

To **increase awareness** in your organisation, put stickers next to light switches. Try to **reduce lighting levels** in areas that aren't commonly used. **Daylight blinds** should be adjusted during the day to regulate the amount of light entering the room. Skylights and windows should be **cleaned regularly** to maximise daylight.

Upgrade your lighting system

It could be worthwhile upgrading your lighting rather than just replacing lamps. A re-fit is the perfect time to re-think your lighting system. Timers help to **reduce lighting levels** at quieter times. Try to incorporate **sensors** for occupancy and light levels and **zonal lighting**. Investigate whether it is possible to install more **reflective fittings** or **light tubes** for free lighting.

There is a wealth of very useful information on the Carbon Trust's website (**www.carbontrust.co.uk**), which includes a lamp selection tool, a calculator for estimating the financial savings and various guides. Remember to visit the **low-energy lighting section** of the Friends of the Earth: Inverness & Ross website.

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