

EFFICIENT LIGHTING – THE WAY AHEAD



A Voltimum expert panel looks at how the EU is driving the move to more efficient lighting.

By James Hunt

ARGUABLY the most important outcome of the European Union's drive for CO₂ emission reductions and greater energy efficiency is the phasing out of inefficient lamps. This began in late 2009 under Eco-Design Regulation 244/2009 first stage (often called 'DIM 1') with the restriction on the sale of all 100W+ GLS, frosted incandescent and non-clear halogen lamps.

Clear halogen lamps Class D&E were to be phased out by September 2012. This process will continue year by year. For example, Class C lamps should be phased out by 2016. Next to be phased out under the second stage of the Eco-

Design Regulation ('DIM 2'), are the least efficient directional halogen lamps, such as the MR16 type.

It has been calculated that when completed, the change to more energy efficient lamps should reduce domestic lighting energy consumption across the EU by 30 per cent, equivalent to cutting a massive 23 million tonnes of CO₂ emissions every year.

The Voltimum 'Expert Panel on Lighting' (see www.voltimum.co.uk/lighting for more) is made up of industry specialists, publishes the very latest UK lighting regulatory and technical information, and answers queries. This article, based on content provided by panel

members for the January 2013 edition of *VoltiTECH*, Voltimum's e-newsletter, focuses mainly on DIM 2, which will restrict the sale of directional light sources, and continue the phasing out of inefficient lamps, starting with the worst performing in September 2013.

Lighting and CO₂ emission Lighting offers one of the biggest opportunities to save energy, while reducing costs and emissions, as it has been calculated to account for up to 40 per cent of a building's total energy consumption. The EU has pledged to cut its energy consumption by 20 per cent, compared with projected levels, by 2020. Around

60 per cent of European lighting installations are still inefficient and 75 per cent of office and industrial installations are still fitted with conventional luminaires. The energy consumption of the least efficient lighting (the now-banned incandescent) is roughly five times greater for the same amount of light as the best – the compact fluorescent lamp and the latest LEDs. Getting rid of incandescent lamps is therefore making a significant contribution towards meeting CO₂ emission targets and reducing dependency on increasingly expensive fossil fuels.

Making lighting more energy efficient is a crucial

Offering a host of benefits, LED lamps have a bright future



component of the fight against increasingly severe climate change, and the aim of the staged phase-out is to force greater use of better alternatives, of which there are now several. Go to www.voltimum.co.uk/VoltiBulletin9_10_0 for more details on the phase-out programme, the timelines, the types of lamps affected and their more efficient replacements.

Eco-Design for lighting

In the UK there is a legal national requirement to reduce CO₂ emissions by 80 per cent (based upon 1990 levels) by 2050. A proposed interim target of a 60 per cent reduction

by 2030 is designed to encourage the realisation of this ultimate goal. These national targets have led to studies under Defra's Market Transformation Programme (MTP), which supports UK government policy on sustainable products and covers all products that fall under the EuP Directive (Eco-Design Requirements for Energy-Using Products, 2005/32/EC). This directive is an integral part of the EU's climate protection programme, and sets minimum environmental performance standards across the EU for Energy Related Products (ErP), required to reduce their environmental impact, including lamps.

DIM 1, DIM 2 and TIM 1

DIM 1, DIM 2 and TIM 1 are unofficial but widely used acronyms for Eco-Design regulations applied to lighting.

DIM 1 – or the first stage of ErP Directive, Regulation EC 244/2009, defines requirements relating to the Eco-Design of non-directional household lamps. It covers the technologies typically used in domestic sector incandescent lamps (now mostly phased out), halogen lamps, compact fluorescent lamps (CFLs) and LED retrofits having integrated control gear. It basically does what it says on the tin, covering non-directional light sources – household lamps.

DIM 2 was published in December 2012, and is the follow-on to DIM 1. It covers directional light sources, including LEDs, and it seeks to phase out inefficient lamps, including conventional low-voltage halogen lamps, starting with the worst performing in September 2013. The proposals include both domestic and commercial luminaires, again setting minimum

energy performance requirements, but they are more complex. A full review of the legislation's effects will take place in 2015.

TIM 1 – By contrast, Regulation 245/2009 (Tertiary Implementing Measures) covers non-domestic (professional) lamps, ballasts/control gear, fixtures and controls, and is product-related and application independent. The products include those used in offices, public buildings, schools, factories, warehouses, workshops, laboratories, shops, restaurants and streets. The target is to save 20 million tonnes of CO₂ a year.

Go to www.voltimum.co.uk/voltiTech_04_09 for more details on TIM 1.

Directional lamps phase-out under DIM 2

Regulation DIM 2 has now been published. The industry and individual manufacturers are working with the EU to understand the regulations more fully, and to identify the specific products affected. However, DIM 2 clearly sets minimum performance standards for directional reflector lamps (such as MR16s) including tungsten, tungsten halogen and compact fluorescent reflector types. In addition, tungsten reflector lamps, older, less efficient LEDs and halogen lighting converters will be restricted from sale in EU markets.

The minimum performance standards apply to all types of directional lamps, covering efficacy, colour ▶



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Philips Lighting's LED expertise provides a changing palette of colour for Brazil's João Alves bridge



rendering and product lifetimes. Note that no lamp type is explicitly banned, but each will have to comply with the minimum performance standards or be phased out through market restriction. Therefore, manufacturers can continue to offer the more energy-efficient lamps (for example, more modern MR16 types that are compliant).

The Lighting Industry Association (LIA) has stated that the least efficient directional lamps will be phased out from September 2013 at the earliest. Following that, other low-efficiency lamp types will be phased-out by September 2014 and 2016.

Lux magazine, which is the official publication of the LIA, has provided answers to a range of frequently-asked questions about DIM 2. Go to www.voltimum.co.uk/article19130 to view these.

Alternative light sources

To replace phased-out lamps, homeowners, along with building facilities managers, will have the choice between compact fluorescent lamps (CFLs), which use up to 75 per cent less energy than conventional light bulbs, and also the latest very efficient halogen lamps, which use between 25 per cent and 50 per cent less energy depending upon the exact type.

They also now have an increasingly important choice in the form of LED lamps. These provide a wide range of benefits, including very long lives (leading to lower total cost of ownership), a year-on-year improvement in luminous efficacy that is now comparable with CFLs, and significant energy savings in many applications. However, LED lighting, which still has a relatively high initial cost, is only just starting to make inroads into homes, though the same is not true of public, retail, commercial and industrial buildings where LED lighting is being taken up in a big way.

The Green Deal

The UK government's Green Deal initiative, announced in January 2013, is designed to help householders and businesses increase the energy efficiency of properties across the UK and reduce their carbon emissions. The idea is that there are no up-front costs; energy-saving measures are funded via loans from the private companies, with the costs repaid over a 25-year period as an additional charge on energy bills.

The Green Deal is also intended to help the sustainable economy by enabling 'green' product introduction right through

to installation for domestic, non-domestic and public buildings. Moreover, it is a fundamental part of the Energy Company Obligation (ECO), which now addresses energy efficiency funding in the domestic sector. Under the ECO, supplier subsidy and Green Deal finance work together. The Green Deal is expected to have a significant effect on lighting. Indeed, Philips Lighting says that Green Deal/ECO financing is a crucial element, and that it would be impossible to optimise the Green Deal for homes without including lighting.

John I Gorse, technical marketing manager at Philips, has provided a PowerPoint presentation that summarises the Green Deal in terms of lighting. This was shown initially on the first day of the LuxLive 2012 lighting exhibition last November. Go to www.voltimum.co.uk/article19135 to view it.

And finally...

The growing importance of LED lighting has already been mentioned. The technology has been spoken about for a decade or more, but only recently has it begun to have the kind of positive impact on general lighting that so many have long forecast. Although development is rapid, it has

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Voltimum's award-winning monthly e-newsletter, *VoltiTECH*, started publication in June 2003, and has now run to nearly 120 editions.

taken some time for LEDs to become truly economically viable. Now, though, the technology is beginning to deliver equivalent acceptable colour rendering, which matches that of the incandescent lamps it is intended to replace, as well as offering high energy efficiency and an extremely long working life, plus many other important benefits.

Key to the adoption of LED lighting is the fact it will lead to a reduction in lighting electricity consumption of between 40 and 80 per cent. However, unlike incandescent lamps, specific types of LED need to be selected if dimming controls are to be used (as well as being a comfort control, dimming can help save more energy). Go to www.voltimum.co.uk/article19170 for a useful summary of LED dimming controls from Legrand. ☑

James Hunt in the managing editor of the UK arm of the Voltimum electrical web portal.