The Institution of Lighting Professionals

# Guidance on current and forth coming legislation within the lighting sector

## Your Lighting Asset Needs You Now!

Whether you design, specify, install or maintain interior or exterior lighting installations this document advises on energy and carbon legislation that you need to know and act upon now.

## Foreword

If you are responsible for the specification, design, installation or maintenance of interior or exterior lighting then I cannot stress how important it is for you to understand the implication of the current and forth coming legislation which is aimed at reducing energy and carbon use and is described within this guidance document.

This is specifically relevant to the requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps. This document gives guidance on the efficacy and performance requirements of these products with dates as to when each stage of the legislation comes into effect and effectively removes products from the market place.

With highway lighting installations having lives typically greater than 30 years and office installations greater than 10 years then it is not a matter of waiting until each stage of the legislation comes into force but to plan ahead and start using equipment now that meets the coming requirements.

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**Contents**

## Executive summary

This guidance document looks at the impact and requirements of current and forthcoming European Commission & Council and UK Legislation / Directives that directly affect the lighting sector, including:

- Background
- The Law
- Energy using Products / Energy related Products Directives (EuP / ErP)
- Carbon Reduction Commitment Energy Reduction scheme (CRCEE)
- Green Public Procurement (GPP)
- Ecolabel

Within the lighting sector both domestic and tertiary lighting (office and street lighting) have received the highest level of attention with perhaps the street lighting sector being the most developed due to the wide and developing range of lamps, ballast and luminaires used whereas the office sector has been principally based around fluorescent lamps technology for many years and it is only the advent of LED's that indicate any real change in office light sources.

The products covered are used within the tertiary sector but are also used in other applications such as industrial buildings, shops, car parks and as such the principals and requirements discussed will be applicable to these areas with respect to carbon and energy savings.

It is important that the designer, client, contractor are aware of the legislative requirements discussed in this document with regard to equipment, implementation and contract requirements and that they plan for the introduction of the equipment required at the earliest possibility. As can be seen from the lamp and ballast requirements to pick just two aspects some existing lamps as well as magnetic ballast will be removed from the market unless the manufacturers can develop them such that the meet the required performnace and efficacy requirements laid down.

EU Regulations may be revised from time to time and the ILP will look to ensure that this guide is as up to date as possible, however users should take care to keep themselves informed referring to the EU Regulations themselves for a full statement of the legal requirements, manufacturer's data as lamps that currently may be phased out under the ErP Directive may be developed such that they remain compliant. In the case of any doubt take independent advice.

A summary of the timeline of some of the requirements for lamps and ballasts under Regulation (EU) No 347/2010 has been produced by Interek as follows:

- 'Fat' linear T10 and T12 halophosphate lamps will be banned from 2012 with the exception of lamps for special purposes.
- Requirements on minimum lumen maintenance levels will be introduced.

- Minimum performance requirements for HID (high intensity discharge) lamps and ballasts to operate such lamps
- From 2012 new luminaires must be sold with electronic ballasts
- The phasing out of High Pressure Mercury lamps by 2015.
- 90% of the High Pressure Sodium lamps should have a minimum life time of more than 16,000 hours.
- Metal halogen lamps should have a minimum life of 12,000 hours for 80% (frosted) and 90% (clear).
- Requirements of directional light sources for street lighting luminaires (not only HID) to reduce light pollution.
- From 2017 all fluorescent lamps must be designed to work with electronic ballasts.
- From 2017 magnetic ballasts are not permitted even for replacement in existing luminaires.

The following table provides headline performnace requirements with key implementation dates, phased improvement targets (P) and final targets (F).

| | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|---|---|---|
| Fat' linear T10 & T12 halophosphate lamps will be banned | | | F | | | | | |
| Minimum efficacy and performance requirements for fluorescent lamps | P | | P | | | | | F |
| Minimum efficacy and performnace requirements for HID lamps | | | P | | | | | F |
| High pressure mercury lamps phased out | | | | | | F | | |
| Performance requirements for fluorescent lamp ballasts | P | | P | | | | | F |
| Performance requirements for HID ballasts | | | P | | | | | F |
| New luminaires to be sold with electronic ballasts | | | F | | | | | |
| Magnetic ballasts removed from the market. | | | | | | | | F |

A number of the above are the current April 2017 minimum performance targets, an initial performance level was introduced in April 2010 for some sources and other stepped improvements are due to come into force in April 2012 and April 2015 for these and other lamps and ballasts. These are all details within this guidance document.

## Introduction

Worldwide there is growing concern over global warming and hence carbon dioxide emissions ($CO_{2(e)}$) as well as energy use which has led to targets being set for the reduction of $CO_{2(e)}$ globally which have been taken up by the European Commission and the UK Government in the form of the:

- Climate change Act 2009
- Energy Act 2009

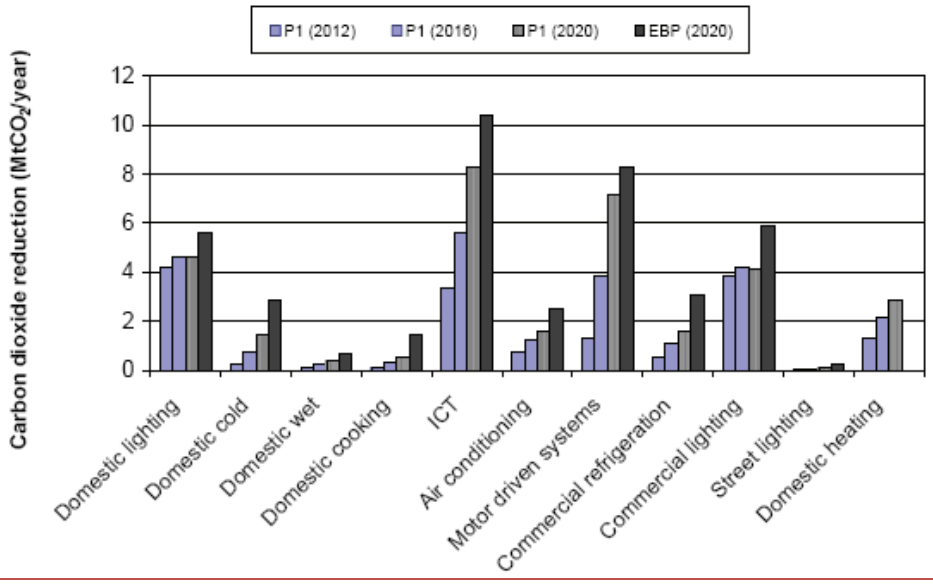
Legally within the UK we now have a national requirement to reduce emissions by 80% (based upon 1990 level) by 2050 and in order to aid this an interim target of a 60% reduction by 2030 has been proposed Government's Committee on Climate Change (CCC) and is being considered.

This has lead to studies under the Market transformation Programme (MTP) which had focused on the following ten market areas.

- **Domestic lighting**
- Domestic cold appliances
- Domestic wet products
- Domestic cooking
- Information communication technology
- Air conditioning
- Motor driven systems
- Commercial refrigeration
- **Commercial lighting**
- **Street lighting and traffic signals**

The Studies have indicated that the $CO_{2(e)}$ savings shown in figure 1 below could be achieved.

**Figure 1 Comparison of projected $CO_2$ savings by product sector**




From figure 1 it should be noted that whilst the potential savings from street lighting are comparatively low the service carries a high visual and energy using profile.

A large number of implementing measures are being made under various Directives and apply to individual products or groups of products. The Department for the Environment, Food and Rural Affairs (Defra) lead on measures resulting from the initial studies which focus on energy efficiency gains. Measures are enforced by the National Measurement Office (NMO).

## The Law, Regulations and Directives

### Energy using Products / Energy related Products Directives (EuP / ErP)

### Directive 2009/125/EC

The European Parliament and Council Directive 2005/32/EC established a framework for the setting eco-design requirements for Energy using Products (EuP). It was recast on the 21st October 2009 as the Eco-Design Directive (2009/125/EC) and established a frame work for the setting of ecodesign requirements for Energy related Products (ErP) to include all Energy using Products (EuP).

The aim of the Directive being to improve the environmental performance of products throughout their life-cycle, by the integration of environmental aspects at a very early stage in product design.

The Directive 2005/32/EC was transposed into UK law under Statutory Instrument (SI 2007 No:2037) and came into force on 11 August 2007 and the ErP Directive was implemented in November 2010.

Under this Directive, the European Commission, assisted by a committee of Member States, adopt implementing measures relating to individual product types. To date these have been adopted by Member States in the form of EU Regulations and as such are directly applicable in the UK and all other Member States. Implementing Measures are the specific product related pieces of legislation (e.g. regulations) that set out the legislative requirements legislative requirements that products sold in the EU will be required to meet from a specific date.

The UK Government is committed to seeking cost-effective ways to achieve targets set to reduce carbon emissions as part of its policy on Climate Change. It has already supported and implemented a range of EU policies aimed at improving energy efficiency standards for traded goods. The UK supports the adoption of regulations consistent with its approach including the Eco-design of Energy related Products Directive.

### Energy related Product (ErP)

An 'Energy related Product' means any goods that have an impact on energy consumption during use. Many energy-related products have a significant potential for being improved in order to reduce environmental impacts and to achieve energy savings through better design which also leads to economic savings for businesses and end-users. In addition to products which use, generate, transfer, or measure energy, certain energy-related products, including products such as luminaires and control systems also contribute to significant energy savings during use. For example when designing an office or street lighting installation a luminaire with high performance optics may result in fewer luminaires being required, this together with a suitable lighting control

system will produce significantly lower whole life installation costs including energy and maintenance aspects for the end client.

Under the above Directives the various energy using product sectors have each been reviewed and specific EU Commission Regulations issued to cover each sector.

**The tertiary lighting sector**

Office and street lighting is commonly termed the tertiary sector and is predominated affected by EU Commission Regulation 347/2010.

**Office lighting**

Office lighting is an important energy using product which has been installed and used for many decades and has in general always been based around fluorescent lamp technology. It is only the advent of Light Emitting Diodes (LED's) that indicates that there will be any change. The application of the ErP Directive covers fixed installation, floor lamps and control systems where they are integrated into the luminaire.

**Street lighting**

Street lighting has been installed for centuries, contributing to human development by providing and improving human vision at night. There has been significant technological progress in this sector over the last decades which continues to develop at a pace with advent of LED's and Central Management Systems (CMS) to name but two aspects.

Street lighting generally has a life of 30 to 40 years and hence a considerable number of old installations based upon old, energy inefficient technology remain in existence. Installations are mostly based on High Intensity Discharge lamps requiring appropriate ballasts and optical systems.

Products not within the scope of tertiary lighting include, traffic signals, tunnel lighting (low sales volumes), city beautification, private car parks, sports areas and industrial sites

**Other sectors**

It should be noted that identical technology from the tertiary sector is used in other lighting applications and therefore this does not exclude that they can directly benefit from the conclusions of the various studies and requirements for performance to bring $CO_{2(e)}$ and energy savings to that sector as commented below.

**Commission Regulation (EC) No 347/2010 of 21st April 2010**

Commission Regulation (EC) No 347/2010 amends Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps and repealed Directive 2000/55/EC of

the European Parliament and of the Council and entered into force retrospectively from 13th April 2010.

Under the Commission Regulations mandatory ecodesign requirements apply to products placed on the market wherever they are installed, therefore such requirements cannot be made dependent on the application in which the product is used (such as office lighting or public street lighting). Therefore this Regulation address's specific products, such as fluorescent lamps without integrated ballast, high intensity discharge lamps, and ballasts and luminaires able to operate such lamps.

Essentially the Regulation sets indicative benchmarks for fluorescent and high intensity discharge products covering:

- Lamp efficacy and lamp life
- Lamp mercury content
- Ballast performance
- Luminaire product information

The core environmental aspects that are identified as significant for the purposes of this Regulation are:

- (a) energy in the use phase;
- (b) mercury content of lamps.

Products exempt from the Regulation include:

- Special purpose lamps used in computer screens, photocopiers, tanning appliances and terrariums
- Lamps that are not white light sources (excluding SON lamps)
- Directional source lamps
- Double ended fluorescent lamps having specific diameters
- Lamps with defined levels radiation in specific wavelengths

Full details of exempt products can be found in Annex I of the Regulation.

Commission Regulations (EC) No 347/2010 and 245/2009 are available from:

**http://www.celma.org/archives/temp/CELMA_EcoDesign_(SM)257_COM_Regulation_347_2010_amending_Regulation_245_2009.pdf**

**http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:076:0017:0044:EN:PDF**

### Regulation (EC) No 347/2010 requirements

The requirements are set out in Annex III of Regulation (EC) No 347/2010 and are broken into three parts:

- Part 1 – lamps – fluorescent lamps without integrated ballast and for high-intensity discharge lamps (efficacy requirements, performance (functionality) requirements, and product information).

- Part 2 – ballasts for fluorescent lamps without integrated ballast and ballasts for high-intensity discharge lamps
- Part 3 – requirements for luminaires for fluorescent lamps without integrated ballast and for luminaires for high intensity discharge lamps

**Part 1 – lamps**

**Efficacy requirements:**

All tables listed below are from the Regulation (EC) No 347/2010 and where they are shown below they may only be 'part tables' to an indicative view on the requirements and the reader should refer to the full version of the Regulation for full tables giving all lamp, ballast and luminaire requirements and the associated foot notes.

**Introduced as of April 2010:**

The rated minimum efficacy standards apply to double-capped T8 and T5 lamps, dependent on the nominal wattage of the lamp, as listed in Table 1

Table 1, Rated minimum efficacy values for T8 and T5 lamps.

| T8 (26 mm Ø) | | T5 (16 mm Ø) High Efficiency | | T5 (16 mm Ø) High Output | |
|---|---|---|---|---|---|
| Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value |
| 15 | 63 | 14 | 86 | 24 | 73 |
| 18 | 75 | 21 | 90 | 39 | 79 |
| 25 | 76 | 28 | 93 | 49 | 88 |

Table 2, Rated minimum efficacy values for single capped fluorescent lamps working on electromagnetic and electronic ballast

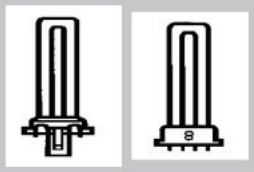
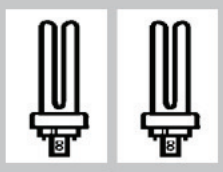
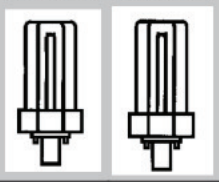
| Small single parallel tube, lamp cap G23 (2 pin) or 2G7 (4 pin)  | | Double parallel tubes, lamp cap G24d (2 pin) or G24q (4 pin)  | | Triple parallel tubes, lamp cap GX24d (2 pin) or GX24q (4 pin)  | |
|---|---|---|---|---|---|
| Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value |
| 5 | 48 | 10 | 60 | 13 | 62 |
| 7 | 57 | 13 | 69 | 18 | 67 |

Table 3, Rated minimum efficacy values for single capped fluorescent lamps, working only on electronic ballast

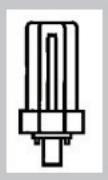
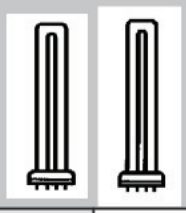
| Triple parallel tubes, lamp cap GX24q (4 pin)  | | Four parallel tubes, lamp cap GX24q (4 pin)  | | Long single parallel tube, lamp cap 2G11 (4 pin)  | |
|---|---|---|---|---|---|
| Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value |
| 32 | 75 | 57 | 75 | 40 | 83 |
| 42 | 74 | 70 | 74 | 55 | 82 |

Table 4, Rated minimum efficacy values for single capped fluorescent lamps with square shape or (very) high output.

| Single flat plane tube, lamp cap GR8 (2 pin), GR10q (4 pin) or GRY10q3 (4 pin)  | | Four or three parallel T5 tubes, lamp cap 2G8 (4 pin)  | |
|---|---|---|---|
| Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value |
| 10 | 65 | 60 | 67 |
| 16 | 66 | 82 | 75 |
| 21 | 64 | 85 | 71 |

Table 5, Rated minimum efficacy values for T9 and T5 Circular lamps.

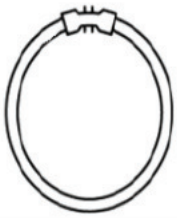
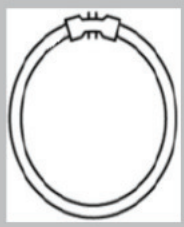
| T9 Circular, tube diameter 29 mm with base G10q  | | T5 Circular, tube diameter 16 mm with base 2GX13  | |
|---|---|---|---|
| Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value | Nominal wattage (W) | Rated luminous efficacy (lm/W), 100 h initial value |
| 22 | 52 | 22 | 77 |
| 32 | 64 | 40 | 78 |

Table 6, Deduction percentages for rated minimum efficacy values for fluorescent lamps with high colour temperature and/or high colour rendering and/or second lamp envelope and/or long life.

| Lamp parameter | Deduction from luminous efficacy at 25 °C |
|---|---|
| Tc ≥ 5 000 K | – 10 % |
| 95 ≥ Ra > 90 | – 20 % |
| Ra > 95 | – 30 % |
| Second lamp envelope | – 10 % |
| Lamp Survival Factor ≥ 0,50 after 40 000 burning hours | – 5 %' |

**From April 2012:**

Double-capped fluorescent lamps of all types will be subject to the same requirements applied to T8 lamps in April 2010, i.e. those lamps not T8 lamps must meet the requirements for T8 lamps listed in Table 1 (column A).

High Pressure Sodium lamps of Ra shall have at least the rated efficacies outlined in Table 7. However where these lamps are designed to operate on control gear for High Pressure Mercury lamps, this requirement does not apply until April 2015. Where these lamps are of T ≥ 5,000K or equipped with a second lamp envelope, lamps shall achieve 90% of the efficacy requirements in Tables 7, 8 and 9.

Metal Halide Lamps will R 80 and High Pressure Sodium lamps with Ra 60 shall have at least the rated efficacies outlined in Table 8. Where these lamps are of T ≥ 5,000K or equipped with a second lamp envelope, lamps shall achieve 90% of the efficacy requirements in Tables 7, 8 and 9

Table 7, Rated minimum efficacy values for high pressure sodium lamps with Ra ≤ 60

| Nominal Lamp wattage [W] | Rated Lamp Efficacy [lm/W] — Clear lamps | Rated Lamp Efficacy [lm/W] — Not clear lamps |
|---|---|---|
| W ≤ 45 | ≥ 60 | ≥ 60 |
| 45 < W ≤ 55 | ≥ 80 | ≥ 70 |
| 55 < W ≤ 75 | ≥ 90 | ≥ 80 |
| 75 < W ≤ 105 | ≥ 100 | ≥ 95 |
| 105 < W ≤ 155 | ≥ 110 | ≥ 105 |
| 155 < W ≤ 255 | ≥ 125 | ≥ 115 |
| 255 < W ≤ 605 | ≥ 135 | ≥ 130 |

Table 8, Rated minimum efficacy values for Metal Halide Lamps with Ra ≤ 80 and for high pressure sodium lamps with Ra > 60

| Nominal Lamp Wattage [W] | Rated Lamp Efficacy [lm/W] — Clear lamps | Rated Lamp Efficacy [lm/W] — Not clear lamps |
|---|---|---|
| W ≤ 55 | ≥ 60 | ≥ 60 |
| 55 < W ≤ 75 | ≥ 75 | ≥ 70 |
| 75 < W ≤ 105 | ≥ 80 | ≥ 75 |
| 105 < W ≤ 155 | ≥ 80 | ≥ 75 |
| 155 < W ≤ 255 | ≥ 80 | ≥ 75 |
| 255 < W ≤ 405 | ≥ 85 | ≥ 75 |

Table 9, Rated minimum efficacy values for other high intensity discharge lamps

| Nominal Lamp wattage [W] | Rated Lamp Efficacy [lm/W] |
|---|---|
| W ≤ 40 | 50 |
| 40 < W ≤ 50 | 55 |
| 50 < W ≤ 70 | 65 |
| 70 < W ≤ 125 | 70 |
| 125 < W | 75 |

**From April 2015:**

High Intensity Discharge Lamps other than High Pressure Sodium lamps and Metal Halide Lamps shall have at least the efficacies listed in Table 9. Where these lamps are of T ≥ 5,000K or equipped with a second lamp envelope, lamps shall achieve 90% of the efficacy requirements in Tables 7, 8 and 9.

High Pressure Sodium lamps of Ra ≤ 60 shall have at least the rated efficacies outlined in Table 7. Where these lamps are of T ≥ 5,000K or equipped with a second lamp envelope, lamps shall achieve 90% of the efficacy requirements in Tables 7, 8 and 9.

Mercury discharge lamps will be banned.

**From April 2017:**

Fluorescent lamps without integrated ballast shall be designed to operate with ballasts of energy efficiency class A2 (as outlined in the ballast requirements below).

Metal Halide Lamps shall have at least the rated efficacies of that listed in Table 10. Where these lamps are of T ≥ 5,000K or equipped with a second lamp envelope, lamps shall achieve 90% of the efficacy requirements in Tables 7, 8 and 9.

Table 10, Rated minimum efficacy values for metal halide lamps (third stage)

| Nominal Lamp wattage (W) | Rated Lamp Efficacy (lm/W) — Clear lamps | Rated Lamp Efficacy (lm/W) — Not clear lamps |
|---|---|---|
| W ≤ 55 | ≥ 70 | ≥ 65 |
| 55 < W ≤ 75 | ≥ 80 | ≥ 75 |
| 75 < W ≤ 105 | ≥ 85 | ≥ 80 |
| 105 < W ≤ 155 | ≥ 85 | ≥ 80 |
| 155 < W ≤ 255 | ≥ 85 | ≥ 80 |
| 255 < W ≤ 405 | ≥ 90 | ≥ 85 |

**Performance requirements**

**Introduced as of April 2010:**

T8 fluorescent lamps without integrated ballast shall have a colour rendering index Ra ≥ 80

**From April 2012:**

All fluorescent lamps without integrated ballast shall have a colour rendering index Ra ≥ 80.

All fluorescent lamps without integrated ballast shall have a lamp lumen maintenance factor of at least those given in Table 11 as appropriate for the different lamp types listed.

Table 11, Lamp lumen maintenance factors for single and double capped fluorescent lamps

| Lamp lumen maintenance factor | Burning hours | | | |
|---|---|---|---|---|
| Lamp types | 2 000 | 4 000 | 8 000 | 16 000 |
| Double-Capped Fluorescent lamps operating on non-high frequency ballasts | 0,95 | 0,92 | 0,90 | — |
| T8 Double-Capped Fluorescent lamps on high frequency ballast with warmstart | 0,96 | 0,92 | 0,91 | 0,90 |
| Other Double-Capped Fluorescent lamps on high frequency ballast with warmstart | 0,95 | 0,92 | 0,90 | 0,90 |

The following introductory phrase cumulative deductions as shown in Table 11a shall be applied to the values in Table 11.

| Lamp parameter | Deduction from lamp lumen maintenance requirement |
|---|---|
| Lamps with 95 ≥ Ra > 90 | At burning hours ≤ 8 000 h: – 5 %<br>At burning hours > 8 000 h: – 10 % |
| Lamps with Ra > 95 | At burning hours ≤ 4 000 h: – 10 %<br>At burning hours > 4 000 h: – 15 % |
| Lamps with a colour temperature ≥ 5 000 K | – 10 %' |

All fluorescent lamps without integrated ballast shall have a lamp survival factor of at least those given in Table 12 as appropriate for the different lamp types listed.

Table 12, Lamp survival factors for single and double capped fluorescent lamps.

| Lamp survival factor | Burning hours | | | |
|---|---|---|---|---|
| Lamp types | 2 000 | 4 000 | 8 000 | 16 000 |
| Double-Capped Fluorescent lamps operating on non-high frequency ballasts | 0,99 | 0,97 | 0,90 | — |
| Double-Capped Fluorescent lamps on high frequency ballast with warmstart | 0,99 | 0,97 | 0,92 | 0,90 |
| Circular Single-Capped Fluorescent lamps operating on non-high frequency ballasts, T8 U-shaped double-capped fluorescent lamps and spiral-shaped double capped fluorescent lamps of all diameters equal to or larger than 16 mm (T5) | 0,98 | 0,77 | — | — |
| | 0,50 at 5 000 burning hours | | | |

High Pressure Sodium lamps shall have at least the lamp survival factors and lamp lumen maintenance factors listed Table 13.

Table 13, Lamp lumen maintenance factors and lamp survival factors for high pressure sodium lamps.

| High pressure sodium lamp category and burning hours for measurement | | Lamp lumen maintenance factor | Lamp survival factor |
|---|---|---|---|
| P ≤ 75 W<br>LLMF and LSF measured at 12 000 burning hours | Ra ≤ 60 | > 0,80 | > 0,90 |
| | Ra > 60 | > 0,75 | > 0,75 |
| | all retrofit lamps designed to operate on high pressure mercury vapour lamp ballast | > 0,75 | > 0,80 |
| P > 75 W<br>LLMF and LSF measured at 16 000 burning hours | Ra ≤ 60 | > 0,85 | > 0,90 |
| | Ra > 60 | > 0,70 | > 0,65 |
| | all retrofit lamps designed to operate on high pressure mercury vapour lamp ballast | > 0,75 | > 0,55 |

Metal halide Lamps shall have at least the lamp survival factors and lamp lumen maintenance factors listed Table 14.

**From April 2017**

Table 14, Lamp lumen maintenance factors and lamp survival factors for metal halide lamps

| Burning hours | Lamp lumen maintenance factor | Lamp survival factor |
|---|---|---|
| 12 000 | > 0,80 | > 0,80 |

**Product information requirements**

**Introduced as of April 2010:**

Manufacturers must make available the information listed in para 1.3 (a-j) of Annex III Regulation (EC) No 347/2010 on free access websites for each fluorescent lamp without integrated ballast or High Intensity Discharge lamp placed on the market.

**Part 2 - ballasts**

**Performance requirements**

**Introduced as of April 2010:**

Non-dimmable ballasts for fluorescent lamps shall meet at least the standards as defined in Tables 17 or 18, depending on the ballast type

Table 17, Energy efficiency index requirements for non-dimmable ballasts for fluorescent lamps.

| LAMP DATA | | | | | BALLAST EFFICIENCY (Plamp/Pinput) | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Non-dimmable | | | | |
| Lamp type | Nominal Wattage | ILCOS CODE | Rated/typical wattage | | A2 BAT | A2 | A3 | B1 | B2 |
| | | | 50 Hz | HF | | | | | |
| | W | | W | W | | | | | |
| T8 | 15 | FD-15-E-G13-26/450 | 15 | 13,5 | 87,8 % | 84,4 % | 75,0 % | 67,9 % | 62,0 % |
| T8 | 18 | FD-18-E-G13-26/600 | 18 | 16 | 87,7 % | 84,2 % | 76,2 % | 71,3 % | 65,8 % |
| T8 | 30 | FD-30-E-G13-26/900 | 30 | 24 | 82,1 % | 77,4 % | 72,7 % | 79,2 % | 75,0 % |
| T8 | 36 | FD-36-E-G13-26/1200 | 36 | 32 | 91,4 % | 88,9 % | 84,2 % | 83,4 % | 79,5 % |
| T8 | 38 | FD-38-E-G13-26/1050 | 38,5 | 32 | 87,7 % | 84,2 % | 80,0 % | 84,1 % | 80,4 % |
| T8 | 58 | FD-58-E-G13-26/1500 | 58 | 50 | 93,0 % | 90,9 % | 84,7 % | 86,1 % | 82,2 % |
| T8 | 70 | FD-70-E-G13-26/1800 | 69,5 | 60 | 90,9 % | 88,2 % | 83,3 % | 86,3 % | 83,1 % |
| TC-L | 18 | FSD-18-E-2G11 | 18 | 16 | 87,7 % | 84,2 % | 76,2 % | 71,3 % | 65,8 % |
| TC-L | 24 | FSD-24-E-2G11 | 24 | 22 | 90,7 % | 88,0 % | 81,5 % | 76,0 % | 71,3 % |

Table 18, Energy efficiency index requirements for non-dimmable ballasts for fluorescent lamps not included in Table 17.

| $\eta_{ballast}$ | Energy Efficiency Index |
|---|---|
| $\geq 0,94 * EBb_{FL}$ | A3 |
| $\geq EBb_{FL}$ | A2 |
| $\geq 1-0,75*(1-EBb_{FL})$ | A2 BAT |

Dimmable ballasts for fluorescent lamps shall meet at least the efficacy requirements set out in Table 19.

Table 19, Energy efficiency index requirements for dimmable ballasts for fluorescent lamps

| Complied class at 100 % lumen output | Energy Efficiency Index of dimmable ballast |
|---|---|
| A3 | A1 |
| A2 | A1 BAT |

The power consumption of fluorescent lamp ballasts shall not exceed 1.0 W when operated lamps do not emit any light in normal operating conditions and when other possible connected components (network connections, sensors etc.) are disconnected.

**From April 2012:**

Dimmable ballasts for High Intensity Discharge lamps shall meet the efficacy requirements set out in Table 15

Table 15, Minimum efficiency for ballasts for high intensity discharge lamps

| Nominal lamp wattage (P)<br>W | Minimum ballast efficiency ($\eta_{ballast}$)<br>% |
|---|---|
| $P \leq 30$ | 65 |
| $30 < P \leq 75$ | 75 |
| $75 < P \leq 105$ | 80 |
| $105 < P \leq 405$ | 85 |
| $P > 405$ | 90 |

The power consumption of ballasts used with fluorescent lamps without integrated ballast shall not exceed 0,5 W when operated lamps do not emit any light in normal operating conditions. This requirement shall apply to ballasts when other possible connected components (network connections, sensors etc.) are disconnected.

**From April 2017:**

Ballasts for fluorescent lamps without integrated ballast shall have the efficiency:

$$\eta_{ballast} \geq EBbFL$$

where EBbFL is defined in Annex II.3.g of the Regulation.

Ballasts for high intensity discharge lamps shall have the efficiency described in Table 16

Table 16, Minimum efficiency for ballasts for high intensity discharge lamps.

| Nominal lamp wattage (P)<br>W | Minimum ballast efficiency ($\eta_{ballast}$)<br>% |
|---|---|
| P ≤ 30 | 78 |
| 30 < P ≤ 75 | 85 |
| 75 < P ≤ 105 | 87 |
| 105 < P ≤ 405 | 90 |
| P > 405 | 92 |

**Product information requirements**

**Introduced as of April 2010:**

Manufacturers of ballasts shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their ballast models. That information shall also be affixed in a distinct and durable form to the ballast.

For ballasts for fluorescent lamps, an energy efficiency index (EEI) class shall be provided, as defined in the measure and as referred to in Table 17

For non-dimmable ballasts not included in table 17 an EEI shall be assigned as depending on their efficiency as described in Table 18

Dimmable fluorescent lamp ballasts receive EEI classes according to the class into which the ballast would fall when it is operated at the 100% lumen output, as described in Table 19.

**From April 2012:**

Ballasts for high intensity discharge lamps, the efficiency of the ballast as defined in Annex II.1.d shall be indicated.

**Part 3 – luminaires**

**Performance requirements**

**Introduced as of April 2010:**

The power consumption of luminaires for fluorescent lamps without integrated ballast shall not exceed the sum of the power consumption of the incorporated ballasts when the lamps they are normally operating do not emit any light when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

**From April 2012:**

Luminaires for fluorescent lamps without integrated ballast and for high intensity discharge lamps shall be compatible with ballasts complying with the third stage requirements, except luminaires with ingress protection grade at least IP4X.

The power consumption of luminaires for high intensity discharge lamps shall not exceed the sum of the power consumption of the incorporated ballasts when the lamps they are normally operating do not emit any light when other possible connected components (network connections, sensors etc.) are disconnected. If they cannot be disconnected, their power shall be measured and deducted from the result.

**From April 2017:**

All luminaires for fluorescent lamps without integrated ballast and for High Intensity Discharge Lamps shall be compatible with ballasts complying with the third stage requirements.

**Product information requirements**

**Introduced as of October 2010**

Manufacturers of luminaires for fluorescent lamps without integrated ballast with total lamp lumen above 2, 000 lumen shall provide at least the following information on free-access websites and in other forms they deem appropriate for each of their luminaire models. That information shall also be contained in the technical documentation file drawn up for the purposes of conformity assessment pursuant to Article 8 of Directive 2005/32/EC:

(a) if the luminaire is placed on the market together with the ballast, information on the efficiency of the ballast according to Annex III.2.2, in accordance with the ballast manufacturer's data;

(b) if the luminaire is placed on the market together with the lamp, lamp efficacy (lm/W) of the lamp, in accordance with the lamp manufacturer's data;

(c) if the ballast or the lamp are not placed on the market together with the luminaire, references used in manufacturers' catalogues must be provided on the types of lamps or ballasts compatible with the luminaire;

(d) maintenance instructions to ensure that the luminaire maintains, as far as possible, its original quality throughout its lifetime;

(e) disassembly instructions.

**From April 2012**

The information provision requirements of the first stage (i.e. from October 2010) shall also apply to luminaires for high intensity discharge lamps with total lamp lumen above 2,000 lumen.

All luminaires for high intensity discharge lamps shall indicate that they are designed for either clear and/or coated lamps within the meaning of Annex II

**Market surveillance and enforcement**

The regulations described require manufacturers to ensure that the products they place on the market perform to the minimum standards stated. The enforcement process is under consideration but is it likely to be undertaken by an existing central Government body who already carry out similar work. Under current legislation the maximum penalty for failure to meet these requirements stands at £5,000, however this is under due review with the aim of raising the maximum penalty such that it provides a sufficient deterrent against non-compliance and will eliminate any financial gains or benefits made and look to deter future offenders.

Information can be gained from **www.defra.gov.uk**

## Carbon Reduction Energy Efficiency scheme (CRCEE)

### Summary

Ratified in October 2009 and revised in April 2010 the CRCEE is a mandatory emissions trading scheme that aims to improve energy efficiency and reduce the amount of carbon dioxide $CO_{2(e)}$ emitted within the UK. In brief any organisation with an annual energy consumption greater than 6,000MWh is included within the scheme.

At present and for the first two years of the scheme a tonne of $CO_{2(e)}$ is valued at £12 for the basis of the emissions charge, for reference 1 kWhr equals 0.54418 Kg $CO_{2(e)}$

### The CRCEE with regard to street lighting

Since the revision to CRCEE in April 2010 (section 4.4) its application to street lighting has been unclear and essentially unmetered passively Half Hourly (HH) and Non-Half Hourly (NHH) supplies have been excluded from the CRCEE whereas dynamically measured HH supplies through a Photocell Array (PECU) or Central Management System (CMS) are included.

A summary of the impact of the changes introduced in April 2010 can be obtained from the Technical / Environmental section of the ILP web site **www.theilp.org.uk**

Under the 2010/11 Government spending review the CRCEE changed further and the original scheme 'payback' of carbon credits to those organisations who did well in reducing their footprint has been removed as such the CRCEE is now effectively a tax.
The whole topic is now very confusing, do authorities look to passive HH trading and thus avoid CRCEE or do they look to dynamic HH trading and thus come under CRCEE, the following advises on some of these points.

At the time of writing (January 2011) the CRCEE is under review (out for consultation) and the purchase of credits is potentially being moved back a year. Guidance received from London Energy Project is not that the scheme is delayed for a year (i.e. reporting still starts as of the 2010/11 baseline footprint due in July 2011), but that the purchase of the allowances is now retrospective rather than in advance. That is, organisations will need to buy allowances for their emissions in 2011/12 financial year, however rather than buying these up front in April 2011 as under the old Scheme, organisations will now buy them after the fact.

This means the purchases will probably happen after April 2012, but for accounting purposes Local organisations will need to budget for these costs in the 2011/12 year and accrue these through to the 2012/13 financial year. As such the financial impact will be felt in 2011/12, even though the purchase is delayed.

As already mentioned CRCEE does not apply totally to street lighting but only where the energy is purchased dynamically, the following commentary may be appropriate:

Passive Half Hourly is the same as dynamic HH (same tariff) except it would see the Meter Administrator (MA) stop using data from the PECU Array and CMS if one is used and instead use the calculated sunrise/sunset times instead. This would not affect the supply contract and Authorities just need permission to switch from dynamic HH to passive HH. As passive HH is outside the scope of the CRCEE at present it will save an Authority that payment.

It should be noted at this point that the Elexon and the Unmetered Suppliers User Group (UMSUG) have revised the NHH sunset/rise burning hours based upon information from PECU Arrays and these were re-issued in November 2010 and now allow for different switching times within an Authority.

With respect to dimming, Authorities under passive HH can still undertake single step dimming, for example from midnight to 5:30am and get the financial benefits (so long as the inventory is updated with the correct dimmed charge code). What Authorities cannot do is variable dimming, i.e. turn the lights on at 90%, dim to 80% at 10pm, 70% at 11pm and then 60% at midnight, etc. Authorities will also not get the benefit of initiatives such as trimming. As such Authorities will need, under Green Public Procurement (GPP) requirements to assess savings vs. costs to see if the savings brought by trimming and multistep dimming would equal or exceed the CRCEE costs.

Meetings are being held with DECC to discuss unmetered supplies and the CRCEE, a guidance document will be produced in conjunction with the London Energy Project advising authorities of the best course of action. It may be for example that an Authority switches to passive HH for just one year, until the CRCEE is changed to either include or exclude all unmetered energy.

At the time of writing it would appear that passive energy measurement will come within the CRCEE from April 2013.

Software programmes such as LIGHT $CO_2$RE are available to aid the designer / organisation calculate their lighting carbon footprint. LIGHT $CO_2$RE is available from ASLEC / HEMSA and the ILP.

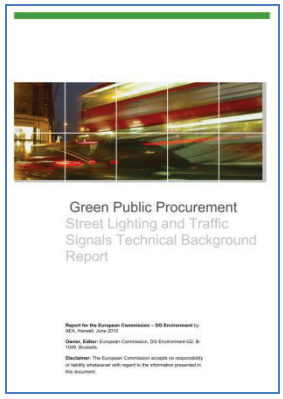
## Green Public Procurement (GPP)

GPP is a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured.

Specific GPP criteria have been developed for ten priority product groups/services that have been identified as most suitable for "greening" under Public Procurement.

When issuing a call for tenders for products or services, the easiest way to use the GPP criteria is to copy and directly paste the criteria which are relevant to the subject matter of the contract into the tendering documents.

One such product group is Street lighting and traffic signals, which in September 2010 saw the publication of the 'Green Public Procurement Street lighting and traffic signals background report' and 'Supporting product procurement sheet'.




The Technical Background Report provides a summary of the GPP criteria developed for the Street Lighting and Traffic Signals product group. The report provides background information on the environmental impact of Street Lighting and Traffic Signals and outlines the key relevant European legislation affecting this product group. It then goes on to describe existing standards and ecolabels that cover these technologies.

The report accompanies the associated Product Sheet that contains the proposed purchasing criteria based upon Regulation 347/2010 and ancillary information for green tender specifications and as such they should be read alongside one another.

GPP is a voluntary instrument and the Product Sheet provides a summary of the GPP criteria developed for the Street Lighting and Traffic Signals product group. The accompanying Background Report provides full details on the reasons for selecting these criteria.

The documents can be obtained at:

http://ec.europa.eu/environment/gpp/pdf/street_lighting_GPP_background_report.pdf

## Ecolabel


The European Ecolabel is a voluntary scheme, established in 1992 to promote products and services with reduced environmental impact during their life cycle and provide consumers with accurate, non-deceptive, science based information regarding the product. Complying products and services are awarded the flower logo.

While the logo may be simple, the environmental criteria behind it are tough, and only the very best products, which are kindest to the environment, are entitled to carry the EU Ecolabel.

Ecolabel criteria are not based on one single factor, but on studies which analyse the impact of the product or service on the environment throughout its life-cycle, starting from raw material extraction in the pre-production stage, through to production, distribution and disposal.

The flower logo helps manufacturers, retailers and service providers gain recognition for good standards, while helping purchasers to make reliable choices

For more information visit: http://ec.europa.eu/environment/ecolabel/index_en.htm

## References

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NB: These notes are intended as guidance only and the tables shown are not complete and only demonstrate the requirements for some lamp wattages. The full tables within the appropriate Directives and Regulations should be read to obtain the information for all lamp wattages and types. The application of the values given in the various tables and text should be given due consideration along with all other factors in the lighting design. Lighting is a complex subject with both objective and subjective criteria to be considered. The notes are therefore no substitute for professionally assessed and designed lighting.