



ENERGY LABELLING and ECODESIGN WORKING DOCUMENT

for comments by 15 September 2011 and for discussion on 23 September 2011

Questions to the Technical Subgroup of the Ecodesign Consultation Forum on the draft energy labelling and draft ecodesign regulations discussed on 5 July 2011

Some of the questions below ask for data on particular aspects. This should be understood as requests for data in addition or in contradiction to that given in the VITO preparatory study and in the follow-up study from UK DEFRA / Swedish Energy Agency / ECEEE (both studies are uploaded to CIRCA as background information). If you do not have information that would complement or question the information already collected in those studies, please skip the answers to those questions.

1. Scope of the regulations

1.1. Professional/household

Do you have information as regards the market share of the following technologies and the impact of the proposed regulations on them?

- a) directional halogen lamps designed for use exclusively in professional lighting

Current MTP models for the UK non domestic sector estimate that for 2011 directional halogen lamps make up 85.4% of all tungsten halogens used within the non domestic market. This works out as 4.25% of the total UK non domestic lamp market within the MTP models.

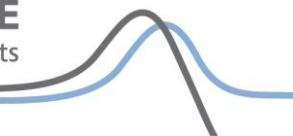
MTP models directional tungsten halogens as two categories – low voltage and mains voltage. Split 68% low voltage (average wattage 64W) to 32% mains voltage (average wattage 84W).

MTP also undertook a survey of retail lighting in 2011 which estimated the number of lamps UK wide within the retail sector. Halogens accounted for 11.9% of stock with an average wattage of 43W. The survey suggested that the models could be underestimating the number of halogens in use.

Proposed regulations would ensure lower average wattages within the market as lamps become more efficient. Total market share decreases as other lamp types are used as replacements. There is no current modelling data available on the extent of these effects.

- b) directional household high-intensity discharge lamps

MTP does not model these lamps in the domestic sector as the current evidence used to inform the models does not suggest a significant market share of these lamps.



In our study of retail lighting in the UK we estimated that directional household high-intensity discharge lamps (in the form of compact metal halide reflector lamps) comprised 5% of lamps used.

There is no modelling data available on the how the regulation would impact the market for these lamps. However, as the regulations stand, all metal halide reflector lamps would be removed from the market at Stage 3. This would be unwelcome. It creates an anomaly because less efficient halogen lamps may still be available for purchase. To compound the anomaly, non-directional metal halide lamps would still be available and could be used in reflector luminaires, which would typically be a similar or less energy efficient solution. This issue is also important because it may actually cause an increase in energy use, as buyers avoid purchasing fittings with metal halide reflector lamps because they will be phased out, and buy less efficient halogen luminaires.

1.2. Special purpose lamps

- 1.2.1. Do you agree with the use of the "special purpose lamps" category (as in Regulation 245/2009, ie lamps claimed to be unsuitable for general lighting, not for household room illumination) as a means of providing exemptions to the draft Regulations' requirements?

MTP agrees.

We agree that the draft Regulations' requirements should apply only to lamps suitable for general lighting, and therefore "special purpose lamps" as defined in the draft Regulation, should be exempted.

- 1.2.2. Do you agree that to facilitate market surveillance, the technical documentation of each lamp claimed to be special purpose should indicate the technical parameters required for the lamp's special purpose, and should do so even if the lamp is technically not different from general lighting lamps?

In order to be exempted from the draft Regulations', the technical documentation of any "special purpose lamp" should clearly indicate that the lamp is designed essentially for types of applications different than general lighting, and the technical parameters required for the lamp's special purpose.

- 1.2.3. Do you agree with the approach that as regards special purpose lamps in the energy labelling regulation, we simply refer to the Ecodesign Regulations?

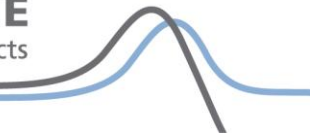
Article 1 – Subject matter and scope

(...) "This Regulation does not apply to special purpose lamps."

Article 2 – Definitions

"Special purpose lamp' means a lamp not intended for general lighting and exempted from minimum requirements in implementing measures of the Directive 2009/125/EC."

We agree.



2. **Definitions**

2.1. LED products

Could you provide your views on the definitions covering LED lamps in the working documents, taking into account the following aspects?

- a) definitions are needed only for those products that are targeted by the provisions of the regulations
- b) if a product group targeted by the provisions of the regulations is too generic compared to the categorisation used outside the context of ecodesign/energy labelling, for clarity it is possible to list in its definition the subgroups that compose the product group (e.g. " 'LED lamp' includes LED modules and self-ballasted LED lamps")
- c) the objective is to define what makes a product group unique compared to other product groups in the context of the regulations, not to provide a complete technical description of the product group

An alternative definition could be:

“Light emitting diode (LED) lamp” means a lamp in which the light is produced by a solid state device embodying a p-n junction, emitting optical radiation when excited by an electric current. It includes LED modules and self-ballasted LED lamps, but not organic LED lamps (OLEDS).”

3. **Tolerances in verification procedures**

Could you provide recommendations for the verification procedure by market surveillance so as to have tolerances more tailor-made to the requirements of the Regulation, instead of the single tolerance value per product category as in the current Annex? Of course, only in case you would find it appropriate at all to better distinguish tolerances.

No comment

4. **Calculation methods for the energy label**

4.1. Efficiency requirements for label classes

What would be the appropriate method to set efficiency requirements for the different label classes?

Options range from the energy efficiency index as calculated in 98/11/EC, to a single lm/W value for each class independently of wattage or light output, with several options including a mixture of these. See more discussion in the Commission's working document 1 on Energy labelling.



Does your recommendation affect the following aspects determined by the method, and if yes, how do you evaluate the effect?

- a) downgrading or upgrading existing lamp classifications
- b) clarity for consumers
- c) equal treatment of technologies, taking into account the main fields of applications covered by the label, and necessary incentives for development
- d) actual energy savings achieved by entire lighting systems, taking into account any incentives created by the label to prefer certain lamp categories over others

Keeping the current method for the range where filament lamps are still prominent i.e. for lower lumen output lamps (<1300 lm), and changing to lm/W for typically professional lamps with higher lumen output (>1300 lm) is probably the best methodology overall, particularly for fluorescent lamps. This is option C as described in the Commission's working document 1 on Energy labelling.

Option A is fine at lower wattages, but less suitable for high powered fluorescent lamps.

Option B, a constant value, would discourage people from buying low wattage lamps.

Option D (different systems for different technologies), would not allow consumers to compare different types of lamp properly.

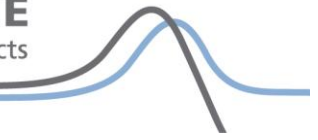
4.2. "Annual" electricity consumption

Do you agree that taking into account the diversity of applications in household lighting and especially in professional lighting, it would be more accurate to indicate the energy consumption over 1000 hours (kWh / 1000 hours), rather than over a year (which always assumes a given amount of operating hours / year, and can be very misleading)?

The energy consumption over a year always assumes a given amount of operating hours per year which depends considerably on the type of application. Although the proposed figure for energy consumption, expressed in kWh/annum and considering 3 hours of use per day, does not reflect accurately the energy consumption for specific applications, it still provides a comparison measure for different lamp types. In addition, the energy consumption expressed in kWh/annum fits better in the framework for the calculation of energy performance of buildings as implemented by the Directive 2010/31/EC.

4.3. Correction for low pressure sodium lamp (LPS) control gear

In Table 2 of the draft energy labelling regulation, the power of all lamps operating on external control gear is corrected by a technology-dependent factor for losses caused by their gear. However, LPS lamps are not listed. Do you agree that LPS lamps should also get a correction factor, and if yes, what should it be?



(LPS lamps are within the scope of energy labelling, as for example in motorway lighting they can be compared to HID lamps and to LED lamps)

Although LPS lamps are used only in particular applications, such as roadway lighting, and are being progressively replaced by other HID lamps, it would still be appropriate to include them in the energy labelling regulation.

There should be a correction factor because the LPS lamp ballasts will use energy. The correction factor could be 1.3 for wattages up to 75W, 1.2 for wattages above 75W and up to 105W, and 1.1 for wattages above 105W.

4.4. Measuring the useful beam angle

On the issue of verifying whether a lamp is a DLS or NDLS (80% of flux in 120 degree cone), and measuring the useful beam angle in 90°/120°: in order to reduce test costs and administrative burden for market surveillance authorities, some alternatives to expensive testing are considered, i.e.

- a) testing in a 180 degree cone ('forward flux'),
- b) report of visual inspection and manufacturer's declaration of beam angle; testing with a goniophotometer only if visual inspection raises doubts.
(‘visual inspection’ would mean that the authority would have to take a photo of the light distribution against an appropriate background. A small software-program that translates the pixel intensity of the photo into an approximate (2 D) flux distribution that would help determine whether a more thorough inspection is to be conducted.)

Which one of these alternatives, if any, would you find acceptable? Do you have a better alternative?

Can you estimate the difference in cost and in availability to market surveillance of the two main measurement instrument (integrating sphere and goniophotometer)?

Some form of goniophotometry will be required anyway in order to determine the beam angle of the lamp.

5. Label layout

Do you agree that three versions of the lamp label are needed?

- a) Independent full label (brand name and model number have to be shown for identification)
- b) Full label on the packaging (no need to repeat the brand name and model number, to save space)
- c) Simple label on the packaging (label class scale alone, it is a version allowed by Directive 98/11/EC that provides flexibility in packaging design since 1998)



If you do not agree, where do you see an opportunity for simplifying the scheme, and for what reason do you want to simplify it? Are there any adverse effects to the simplification (e.g. less flexibility in the design of small packagings), and if yes, how do you propose to tackle them?

No comment.

6. Efficiency of directional lamps

6.1. Efficacy range of the technologies involved

Could you provide your latest information as regards the available efficacy range of the following directional lamp types, in three typical wattages? With luminous flux measured in a 90° cone (except for compact fluorescent lamps where it is measured in 120°). If you deviated from this useful beam angle please clearly indicate it.

Lamp types:

- ✓ Incandescent
- ✓ conventional mains voltage halogen
- ✓ conventional extra low voltage halogen
- ✓ xenon-filled mains voltage halogen
- ✓ infrared coated extra low voltage halogen with external transformer
- ✓ infrared coated extra low voltage halogen with incorporated transformer
- ✓ Compact fluorescent lamp
- ✓ High intensity discharge lamp
- ✓ non-retrofit LED module
- ✓ extra low voltage retrofit LED (requiring external control gear)
- ✓ Self-ballasted LED lamp

Suggested format for the information for each lamp type:

Lamp type 1	Model designation	Flux measured in 90° (120° for CFLs)		Flux measured in 180°	
		Lowest efficacy	Highest efficacy	Lowest efficacy	Highest efficacy
[Lowest wattage category]	[e.g. MR16]	[e.g. 12 lm/W]			
[Most frequent wattage category]					
[Highest wattage category]					

We would also be interested in learning what your estimate is of the efficacy likely to be achieved by each lamp type by 2016.



No data available.

6.2. Optical efficiency of the reflector

What level of optical efficiency can you observe in mainstream examples of the different categories of reflector filament lamps (MR, AR, R/NR, PAR), expressed as % of the light from the source that is leaving the lamp?

No data available.

7. **Requirements for retrofit LED lamps replacing fluorescent or high-intensity discharge lamps**

Do you agree with the principle that such retrofit LED lamps should be required to have similar photometry, at least equivalent luminous flux and smaller power than the lamps they intend to replace? If yes, could you suggest a formulation for this requirement and a verification procedure to check conformity with the requirement? If not, what method (if anything) should we use in setting requirements on fluorescent and HID retrofit lamps?

Agree with the principle.

8. **Halogen lighting converters**

Could you suggest a set of requirements for halogen lighting converters that make sure all of the following criteria are met:

- a) The requirements bring significant cost savings to the end-users of important categories of halogen lighting converters.
- b) No category of halogen lighting converter is phased out that would not have an equivalent replacement that can operate the same lamps.
- c) The safety of lamps using external halogen converters is not compromised.
- d) No lock-in effect is created that would block the upgrading of extra low voltage halogen installations with extra low voltage retrofit LEDs (e.g. flexibility of the converter to work with radically smaller system wattages).

No comment.

9. **Lamp functionality requirements**

9.1. Measurement of lifetime

Can you propose a solution for checking compliance with lifetime requirements of lamps that have a long life? Is it for example a feasible option to set a requirement on lamp survival factor after a shorter time (e.g. 6 months of testing), rather than to make market surveillance wait until the end of the lamp's claimed life?



A shorter timescale for testing would allow new improved lamps to reach the market more quickly.

Do you consider that current method of determining lamp lifetime (50% lamp survival at the claimed lifetime) raises issues of consumer confidence in lamps?

Although the current method based on 50% lamp survival at the claimed lifetime may raise issues of consumer confidence in lamps, this might not be a critical concern.

9.2. Power factor

Is the definition of power factor appropriate for the purposes of lighting products?

The definition of power factor is appropriate.

Do you consider the power factor as a necessary functionality requirement, or could the Regulation do without it?

The power factor is a necessary functionality requirement, as it addresses the issue of real power and apparent power in the circuit. A lower power factor leads to more current drawn by the load than in case of a higher power factor, for the same amount of useful power transferred, which increases the energy lost in the circuit. This means higher energy consumption.

What levels of power factor would you find acceptable for CFLs and LEDs?

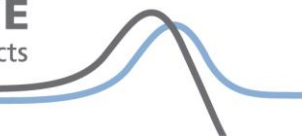
Power factor requirement should be set at a level which is achievable for all types of CFLs and LEDs.

9.3. Level of ambition

Please assess the level of ambition of the proposed functionality requirements for the different lamp types in Tables 5 to 7.

The functionality requirements for directional CFLs in Table 5 are largely based on the CFL functionality requirements set in Regulation 244/2009, which seem to be generally feasible for directional CFLs as well. However, during a detailed survey¹ of multiple compact fluorescent reflector lamps, it was noticed that the requirement concerning lamp warm-up time to 60% Φ might be difficult to meet. No lamp was identified to have a warm-up time below 40s as required in Stage 1. The warm-up time for the best performing compact fluorescent reflector lamps was 45s (nominal) and 60s (maximum), and 120s (max) for amalgam lamps. Therefore, it might be helpful to make this requirement more permissive by choosing a lamp warm-up time to 60% Φ of 60s or 120s for amalgam lamps.

¹ BRE undertook a detailed survey of the data available for various lamps of these types. The lamps were produced by several manufacturers and we assessed the level of ambition of the proposed requirements based on their comparison with the parameters data available for the existing lamps.



For LEDs, a 15,000 hour lifetime test is inappropriate for Stage 1, as it would take two years to carry out such a test, and Stage 1 is to be implemented after a year. Either this test should be postponed until Stage 2, or a different measure of 90% lumen maintenance after 6000 hours should be used instead. The latter measure would allow new forms of LED lamp to be placed on the market more quickly, within one year of development.

It is recommended to decrease the colour rendering requirements for LEDs to $Ra \geq 70$, or $Ra \geq 80$ when retrofitting incandescent lamps. This recommendation is because the colour rendering index (Ra), which was originally developed for fluorescent lighting, does not reflect entirely the colour rendering properties of LEDs, which seem to be preferred by users when bright, saturated colours of objects are required to be rendered. LEDs intended for outdoor use should be exempt from this requirement altogether.

Some LEDs are colour changing. For these types, the requirements could permit sale if the LED met the colour rendering index standard for one of its settings, provided it also met the energy efficiency requirements at the same setting.

9.4. Retrofit lamps

Should retrofit lamps (e.g. LEDs or CFLs replacing reflector incandescent bulbs) comply with additional functionality requirements as compared to non-retrofit lamps? If yes which should be these additional requirements?

Lamps specifically marketed as a retrofit to incandescent bulbs should be able to provide the same quality of light as the replaced lamps. In addition to the requirements already introduced by the Ecodesign Regulation, it would be appropriate to recommend warm white colour appearance for both LED and CFL retrofit lamps – a correlated colour temperature below or equal to 3500K.

10. Product information requirements

10.1. Do you agree that at least an indication of the luminous flux of the lamp should be required on the lamp itself (to help consumers replace the lamp at the end of life)?

In order to help consumers replace the lamp at the end of life with a lamp having equal or superior light parameters, we suggest an indication of the luminous flux of the lamp (in lumens) along with the nominal beam angle (in degrees) should be required on the lamp itself.

10.2. Requirements on minimum luminous flux for lamps claimed to be retrofits to conventional halogen reflector lamps

Would you agree if instead of listing the luminous flux requirement for each lamp technology in three columns (obtained through average lumen maintenances applicable to the entire technology), the Regulation provided for a dynamic calculation



of the minimum luminous flux by using a multiplication factor obtained from the claimed lumen maintenance of the particular retrofit lamp model?

Listing the luminous flux requirement for each lamp technology would probably ease the process of choosing the correct wattage of the replaced halogen lamp. Nevertheless, a dynamic calculation of the minimum luminous flux would provide more precise results and could be used to provide the wattage of the equivalent halogen lamp which could be replaced by a certain lamp with a given luminous flux.

10.3. Do you agree that the warning about a luminaire's non-compatibility with energy saving lamps should be introduced as a product information requirement?

Such 'luminaires with negative lock-in effect' would be defined as a general lighting luminaire that is not compatible with lamps classified as 'B'.

The compatibility would be established in harmonised standards, taking into account socket type, dimension of the space available for lamps, dimmability etc. Awaiting the harmonised standards, a transitional method to establish compatibility could be published as a Commission communication in the OJ (just as for measurement methods for some products).

An indication of the luminaire's non-compatibility with energy saving lamps would be beneficial in order to help consumers either to choose the correct luminaire based on light quality requirements, or to purchase correct replacement lamps for the specific luminaire.