

**ENERGY LABELLING  
WORKING DOCUMENT 1  
for discussion on 5 July 2011**

**Explanatory Note**

**on possible energy labelling requirements  
for general lighting lamps (revised requirements) and household luminaires**

**ENERGY LABELLING  
WORKING DOCUMENT 1  
for discussion on 5 July 2011**

**Explanatory Note**

**on possible energy labelling requirements  
for general lighting lamps (revised requirements) and household luminaires**

1.	Scope .....	2
1.1.	Professional lighting.....	2
1.2.	Additional parameters .....	3
1.3.	Luminaire labelling .....	3
2.	Requirements.....	4
2.1.	Label types .....	4
2.2.	Levels .....	5
2.3.	Calculation methods.....	6
2.4.	Method of developing definitions .....	8

The objective of the meeting will be to gather the views of the participants on the principles that should govern the provisions set out in the Regulation, for example on the allocation of lamp technologies to label classes (there has been a change in approach compared to the preparatory study), or on the method of establishing definitions. A subsequent consultation is planned on the concrete and detailed provisions with those interested experts who have evidence about which definitions and limit values should translate the principles discussed in the meeting.

**1. SCOPE**

**1.1. Professional lighting**

**Why extend the existing label to all professional lamps (including high-intensity discharge lamps)?**

1. Fluorescent lamps (FL) are already covered by the label, they are used both in professional and home lighting. This creates an asymmetry with high-intensity discharge (HID) lamps (only used in professional lighting). HID and FL are sometimes alternatives to each other in the same applications (e.g. slow traffic street lighting, supermarkets) and therefore it should

be possible to compare them, even if they are not direct replacements to each other in the same luminaire.

2. Light-emitting diodes (LEDs) are becoming competitors to both fluorescent and HID lamps (even as retrofits in the same luminaires), so their energy efficiency should be capable of comparison.

3. So far purchasers and owners have not been paying attention to the energy classes of professional lamps, as they have tended to be in A class (or B class in the worst case), or unlabelled. The new system would introduce A+ and A++ classes, doubling the number of possible classes for professional lamps – class distinctions would become more meaningful in this context.

Note that the application of the full energy label would only be required for lamps that are displayed at a point of sale. In professional lighting, lamps are not displayed at points of sale, meaning that the regulation will only require the letter of the label class to be displayed in advertisements, online catalogues, product brochures, product fiche, technical documentation etc.

## **1.2. Additional parameters**

**Why does the label only cover annual energy consumption in addition to the energy efficiency classes, and not light output and lamp lifetime as under Directive 98/11/EC?**

Information requirements on other relevant parameters (light output, lamp life, colour temperature, warm-up times, mercury content etc.) are already or will be set out in the Ecodesign regulations applying to the different lamp types (Regulations 244/2009 and 245/2009 + the upcoming directional lamps regulation).

If such requirements were introduced in the energy labelling regulation, the Ecodesign regulations would have to be amended to avoid overlaps and duplication. These amendments of recently adopted and implemented legislation would cause a lot of confusion on the market.

The only parameter not required by the Ecodesign regulations so far is annual energy consumption. This parameter has been regularly used in new Energy Labelling regulations adopted under Directive 2010/30/EU, and allows consumers to be aware of the absolute energy consumption of the appliances they own or purchase, and to make comparisons of products on that basis.

## **1.3. Luminaire labelling**

Household luminaires are often sold with incorporated or accompanying lamps. In order to avoid different treatment of lamps depending on whether they are sold on their own or accompanying a luminaire, the Regulation should ensure that consumers are informed about the energy efficiency of lamps regardless of the sales method.

Possible options:

*Option A: Lamp labels displayed with luminaires*

Introduce distributor responsibility for displaying the label or the packaging of the lamps on the shelves alongside luminaires (only if lamps are included with the luminaire).

Drawbacks:

1. Some luminaires would be accompanied by energy labels, some not, as there would be no information provided for luminaires sold without bulbs. Consumers would want to compare luminaires in the shop, once they see an energy label accompanying some of them.
2. No information would be provided to consumers on the range of efficiency of the lamps compatible with a luminaire. It would be useful for them to know if a luminaire is incompatible with lamps above a certain energy class.
3. It would cause aesthetic problems for shops specialised in decorative lighting to have to arrange lamp packagings on the shelves.

*B. Introduce luminaire labelling for all household luminaires*

A special luminaire label would be introduced showing the range of classes of compatible lamps, with the possibility to superimpose an indication of the class of the lamp(s) actually included in the packaging.

The drawbacks listed under Option A would be eliminated.

*C. Introduce luminaire labelling for all luminaires (including professional)*

The labelling scheme under Option B would not be limited to household luminaires.

Drawback:

Although this would tackle the situation with household luminaires, it would introduce an unnecessary burden in the professional luminaire market. When purchasing professional luminaires, the coupling of lamps with luminaires varies greatly, and it is subordinated to the lighting design of the entire installation. In such a context, luminaire labelling would have no relevance and would be instead confusing.

*Proposal:* use option B.

## **2. REQUIREMENTS**

### **2.1. Label types**

#### **Label types to be defined in the Regulation**

Considering point 1.3 above, the following label types are proposed to be defined in the draft Regulation for general lighting lamps and household luminaires:

<b>Type</b>	<b>Products using it</b>	<b>Content</b>
Full lamp label	Lamps with label on the packaging but with annual energy consumption not stated elsewhere	Energy efficiency class Annual energy consumption
Simple lamp label	Lamps with label on the packaging and with annual energy consumption stated elsewhere on the box	Energy efficiency class
Full luminaire label	Household luminaires sold with accompanying lamps	Energy efficiency classes of compatible lamps Energy efficiency classes of included lamps
Simple luminaire label	Household luminaires sold without accompanying lamps	Energy efficiency classes of compatible lamps

Each label type is defined in both B/W and colour versions. For lamps, additional label types are defined for cases when the label is printed on the packaging and the brand and model information can be omitted to save further space.

## **2.2. Levels**

### **Rationale behind the class limits**

We want to ensure that the same technologies get the same reward, whether they are non-directional or directional. This does not seem to be ensured by the application of an optical correction factor for directional lamps, as proposed in the VITO study. When buying lamps, consumers know whether they need a non-directional or a directional lamp, they rarely compare the two categories to each other. They need meaningful distinctions within the two categories, not between them.

The table below details which technologies we aim to cover with the label classes. For non-directional lamps, the class limits are those defined by Directive 98/11/EC up to class A (except for lamps with luminous flux > 1300 lumen, as discussed below in 2.3). For non-directional A+ and A++, and for the whole range of directional lamp classes, a first proposal from the European Lamp Companies Federation is included in the draft regulation. However, the precise method to draw the limits of the classes needs to be discussed in the meeting on 5 July. Based on this method, the values will have to be established subsequently with experts, taking into account any alternative evidence on lamp performance.

Energy efficiency class	Energy Efficiency Index for non-directional lamps	Energy Efficiency Index for directional lamps
A++ (most efficient)	[top-class LEDs 2016, Low-pressure Sodium]	[top-class LEDs 2016]
A+	[top class LEDs 2012, triphosphor tubes, HPS with CRI<60, MH 2017]	[top-class LEDs 2012]
A	[compact fluorescent lamps, halophosphate tubes, HPS with CRI>60, MH 2012]	[compact fluorescent lamps, reflector HID]
B	[halogen with infrared coating, special FL and HID (e.g. high CCT or CRI)]	[halogen with infrared coating, special FL and HID (e.g. high CCT or CRI)]
C	[Xenon-filled halogen and extra low voltage standard halogen]	[Xenon-filled halogen and extra low voltage standard halogen]
D	[Incandescent]	[Incandescent]
E (least efficient)	[Incandescent]	[Incandescent]

Legend: HPS = high pressure sodium lamp, CRI = colour rendering index, MH = metal halide lamp, HID = high intensity discharge lamp, FL = fluorescent lamp, CCT = correlated colour temperature

### 2.3. Calculation methods

#### Change in the formula used to calculate maximum wattage per class

In 1997, the energy label was designed with incandescent/halogen bulbs in mind, for which it is true that the more light that lamps of exactly the same technology (filament, filling gas) produce, the more efficient they are. Putting bad quality but high output lamps in the same class as good quality but low output lamps would have interfered with technological competition for more efficiency. It was therefore decided to increase the energy efficiency requirements with light output.

However, fluorescent, HID and LED light sources do not obey the rule on efficiency increasing with light output. Their efficiency has only limited links to their light output. It fluctuates arbitrarily across the light output range. In the past this was not a problem, as these lamps were most of the time in class A, and there was no further distinction in energy efficiency in that class. But now we want to introduce classes above A, which means we will have to distinguish among those lamps. If all technologies are treated equally, the only parameter that matters for the energy efficiency of lighting is how much light is obtained from a given energy input. In principle, it would be appropriate to set a single lumen/watt requirement for each class.

But incandescent / halogen bulbs are still around, and we would like to avoid changing their well-established energy efficiency classification. The same formulae are used for setting minimum efficiency requirements for light bulbs in ecodesign regulation 244/2009 as for

defining class limits in 98/11/EC. However, incandescent / halogen bulbs largely occupy the low light output range (150 – 1300 lumens, the higher end corresponding to 100W incandescents). Lamps with more than 1300 lumens are normally used in professional lighting (with the exception of high-wattage halogen tubes used in uplighters and reflector luminaires).

#### Possible options:

*Option A: Not changing the current method: with more light, higher efficiency is required*

Fluorescent, HID and LED lamps would be subject to arbitrary classification, with unduly tougher requirements at high light outputs. The same technology would get A+ class at a certain light output and A or B at a higher output. This could have two negative effects:

a) When a new lighting installation is created, more A+ class low lumen output lamps could be installed in more luminaires to achieve the same illumination as could have been achieved with fewer A class high lumen output lamps, in order for the designer or the owner to be able to say that A+ class lamps were chosen. The energy consumption of such a system would be higher than optimal.

b) More technological development would be needed at higher light outputs to achieve the top classes as compared to lower light outputs, which would also make top-class high light output lamps more expensive. This could steer the market towards using lower light output lamps at the expense of higher light output ones, reinforcing the phenomenon described under point a).

*Option B: Changing to single lm/W requirement across the light output range*

All currently labelled lamps would have to be reclassified. In order to avoid going for the lowest common denominator, lamps would have to be both upgraded and downgraded, the latter especially in the lower lumen outputs, particularly affecting household lamps.

This would create a problem for filament lamps, where bad quality but high output lamps would be in the same class as good quality but low output lamps. This would disincentivise technological development for higher output filament lamps.

*Option C: Keep the current method for the range where filament lamps are still prominent (<1300 lm), changing to lm/W for typically professional lamps (>1300 lm),*

In each class, the lm/W value calculated according to the old method for 1300 lm would become the requirement for all lamps > 1300 lm, with no further increase in efficiency. This would ensure a smooth transition between the two parts of the range, with neither a drop nor a jump in efficacy requirements at the borderline.

Lamps >1300 lm would have to be reclassified, but no downgrading would occur, only upgrading (e.g. some lamps would be in higher classes than now). This would not affect high-output C-class xenon halogen tubes, which would remain C-class. But for example, some fluorescent lamps which used to be B class would become A class (e.g. 120W in Table 4 of 245/2009).

However, this upgrade is counterbalanced by the fact that it does not happen into top class, as the A+ and A++ classes come on top of A class. Also, the lamps that are promoted to A class were mostly used in professional lighting so far, and purchasers have not been watching out for the energy classes of professional lamps, as explained in point 3 under "Why extend the existing label?" question above.

On the negative side, there is no intention to change the formulae used in Regulation 244/2009, so even if a 400W halogen tube could be C-class according to the new Energy Labelling regulation, it would still not be allowed on the market if it does not comply with the tougher requirement in Regulation 244/2009 based on the old C-class formula.

*Option D: Make the method technology-based (apply current method to filament lamps, single lm/W to other technologies)*

The same class, same light output would mean different energy efficiency in practice, depending on the technology. It would be misleading to consumers.

All fluorescent and LED lamps would have to be reclassified, including the ones used in households.

*Proposal: use option C.*

#### **2.4. Method of developing definitions**

The European and international standards covering the products in scope of the Regulation provide definitions for most of the products and their key parameters. However, these definitions are not always optimal for the purposes of the Regulation, as their structure and content was not necessarily created with the broad scope and context of EU legislation in mind. On the other hand, deviating from the definitions used in the standards creates some confusion for manufacturers and market surveillance authorities, who need to deal with the standards in the context of safety legislation and with the Regulation in the context of energy labelling. This problem is especially acute with fast emerging technologies like LEDs, for which standards including definitions are just in the process of development and adoption in the standardisation organisations.

Nevertheless, the approach chosen in the draft Regulation was to give priority to clarity, simplicity and coherence, as the Regulation has to be able to stand on its own. The definitions from European and international standards were the starting point, but they were reorganised and modified to the extent this improved the internal logic and the level of complexity of the Regulation, or aligned it better with existing EU legislation.