Texte zu den geplanten neuen EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchskennzeichnung in der Beleuchtung – Zusammenstellung * des Umweltbundesamtes (UBA), Deutschland

Entwürfe der EU-Kommission vom 6. November 2015

Stellungnahme Dänemarks vom 3. Februar 2016

Hinweis: Bitte beachten Sie, daß der angehängte Text nur in Englisch verfaßt ist.

EN: Information on the coming EU Lighting Regulations – Ecodesign and Energy Labelling – Compilation * of the Federal Environment Agency (UBA), Germany

The EU Commission's drafts of 6 November 2015

Comments by Denmark as of 3 February 2016

FR: Informations sur les futures réglementations de l'UE concernant l'éclairage – l'écoconception et l'étiquetage énergétique – Compilation * de l'Agence Fédérale de l'Environnement (UBA), Allemagne

Les projets de la Commission Européenne du 6 novembre 2015

Commentaires du Danemark du 3 février 2016

Indication: Veuillez noter que le présent texte n'est disponible qu'en anglais.

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* http://www.eup-network.de/de/eup-netzwerk-deutschland/offenes-forum-eu-regelungen-beleuchtung/dokumente/texte/

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

Danish Energy Agency

European Commission
DGENER

By e-mail

Office/Department
Centre for Industry and Energy Efficiency

Date
03 February 2016

Danish comments to the EU Commissions draft proposal for ecodesign and energy labelling regulation for lighting products.

The Danish Energy Agency (DEA) welcomes the draft proposal of the lighting regulation on ecodesign an energy labelling.

Most important remarks

- The DEA support the idea of a simpler approach by limiting the product categories and thereby reducing the complexity of the regulation. This should be done in a clever way that avoids backsliding of existing regulation and in a pace that the European consumers won't experience changes in price and quality of lighting products.
- The regulation should take into consideration standby mode of smart lamps and other lighting products.
- The threshold values in the energy label should be designed in a way that the variation of energy efficiency between lighting products is easily visible to European consumers.

Below please find general and specific comments to each article of the draft regulation.

(Article 1) Subject matter and scope

The DEA welcomes the approach of a regulation with a wide scope and no special products. This makes it even more important with clear definitions of products that are exempted from the regulation. A more detailed definition is needed for (h) pieces of art.

Luminaires

The DEA recognise the need for energy requirements for luminaires with integrated LED (LEDi-luminaires), but is concerned about having the same energy efficiency requirements for LEDi-luminaires as for lamps, as suggested in the draft proposal.

The light output ratio (LOR) will usually decrease in luminaires designed with special care for visual comfort, low glare or high visual appearance. This is the case for LEDi-luminaires and for luminaires with separate lamps. Setting the same energy efficiency requirements for LEDi-luminaires as for lamps will become a barrier for the development of visually comfortable and attractive looking LEDi-luminaires for residential lighting, hotels, restaurants, resorts

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etc. As a consequence of the draft regulation, the manufacturers and luminaire designers will naturally tend to develop such comfortable luminaires with exchangeable lamps in order to avoid energy efficiency restrictions for the luminaire.
Therefore the DEA suggest that the Commission 1) continues to work with requirements for luminaires
2) Further investigate which efficiency requirements would be reasonable to set for LEDi-luminaries
3) Ensure that the requirements for LEDi-luminaires won't create loop holes in the regulation.

(Article 2) Definitions

Lighting products and lighting product components
In the draft regulation all lighting products are divided into (9) Lighting products and (10) Lighting product components which is further divided in Annex II into (1) Lightings parts (light emitting components such as lamps, modules and luminaires needing control gear, electrical conversion or other voltage) and (2) Auxiliary parts (not light emitting).

The DEA suggests that the definitions are divided into two overall categories where all light emitting products are in the same category. In the current draft definitions the (1) Lighting parts have the same characteristics as the products in the (9) Lighting products. We therefore suggest the following two definitions:

(9) 'lighting product'[1] means a configuration of one or more components that can be operated with electrical power and this configuration has the primary function of emitting light with all of the following characteristics:
(a) a light emission with a rated luminous flux of 60lm ≤ Φ ≤ 100klm;
(b) a maximum luminous flux of 1klm/mm2 of the light-emitting surface's orthographic projection viewed from the direction with the highest luminous intensity;
(c) a colour rendering index of CRI ≥ 0Ra.

(including lamps, LED-modules and luminaires with integrated LEDs, but not luminaires marketed without a lamp or other light emitting components)

(10) 'auxiliary part' means a component to be used in combination with or as a part of a lighting product, and has one or more of the following functions:
(a) to transform electricity by supplying a different voltage, limiting the electrical current, or changing the current's directionality or frequency (including, but not limited to, transformers and power converters);
(b) to control, process and/or regulate switching, luminous intensity and/or chromaticity of the emitted light (including, but not limited to, control devices and dimmers).

(components in combination with or as part of a lighting products including luminaires with such 'auxiliary parts'.)

Luminaires
A definition of luminaires might be necessary in the regulation. EN 60598-1 (harmonised standard under the Low Voltage Directive 2006/95/EC) defines a luminaire as:

- be directly connectable to the voltage supply without any socket
- comply with all electrical safety requirements under the Low Voltage Directive to be marketed as a luminaire

Neither lamps nor LED modules will comply with these requirements.

(Annex I) Definitions for the purpose of Annexes I to V

Lumen deterioration.
Lumen deterioration is defined in annex I (6). The definition is unclear.

Full load.
Definition missing.

Off mode power consumption
Definition of Off mode is missing
Off-mode could mean that there is no light emission and that the requirement means that lamps without integral control shall not draw power in the off-mode.

Does Off-mode also include that it is not allowed to switch off the light on the secondary (low voltage) side of a converter (halogen transformer or LED driver) as this would result in energy losses in the converter? In case this is included, this could be formulated by the requirement: switching has to be executed on the primary (mains voltage) side.

(Annex II) Ecodesign requirements

Ecodesign efficacy stages
The present regulation 245/2009 for linear fluorescent lamps, high pressure sodium lamps and metal halide will in 2018 already be at the proposed stage 2 level in the draft regulation. In case the proposed stage 1 is introduced in 2018 this would lower the energy efficiency requirements for the above mentioned lighting technologies. This will send a wrong signal and could result in back sliding.

If the approach of one set of energy efficiency requirements that cover all lighting technologies is to work from the first stage, the DEA would suggest to start with the suggested stage 2 as stage 1 in 2018, ensuring that the existing requirements for lighting technologies covered in the existing 245/2009 are not lowered.

Alternatively an incremental approach could be chosen, gradually reducing the set of requirement equations to one technology neutral.

Stage 2 will phase out all halogen lamps and a great part of CFLs used in the domestic sector. Only the most efficient CFLs would stay at the domestic market. In the present situation more than 2.5 years ahead of 1/9 2018, the LED prices have decreased substantial and is not far from the price level for CFLs. LED replacements are available for most kinds of lamps. The LED lighting quality is equal or better than what

CFLs provide. There is no mercury content in LEDs. On this ground DEA propose implementation of the proposed stage 2 in 2018 (as stage 1).

The DEA recommend the proposed stage 3 is implemented in 2020 or 2021 as stage 2.
A new more ambitious stage 3 should be developed for 2024. It is hard to forecast the development 8 years ahead but it is important for industry to know the future plans.

Standby mode power consumption
The DEA agrees that the regulation has to include a maximum standby power consumption requirement for lamps with integral control (e.g. motion-sensors, photo-sensors, wireless control, standby mode or connected functionality). It is also necessary to consider extra connectivity equipment (not a part of the lamp) as gateways, hubs and network controllers (excluding equipment which also used for other appliances as the WIFI router).

DEA find that a general maximum standby consumption of 0.5 W is not sufficient. The standby consumption of a lamp in standby mode several hours during a day will eventually reach the same consumption than the LED lamp in on mode.

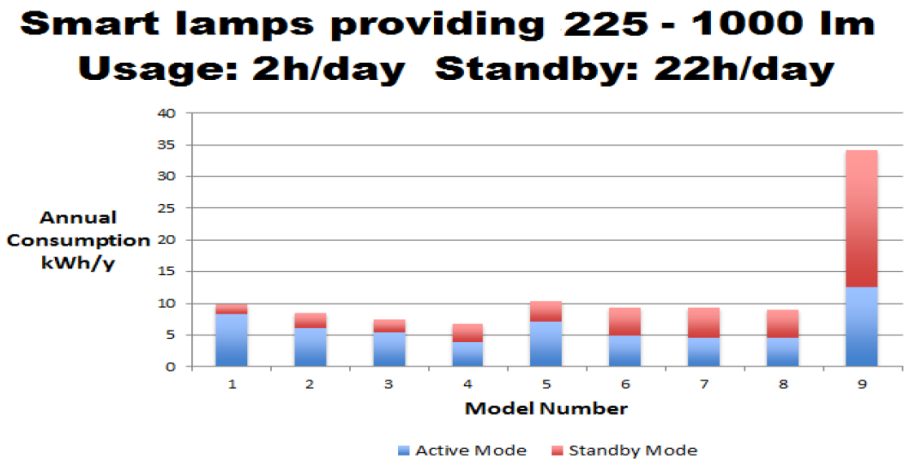

Figure 1 Annual consumption smart lamps[2]

DEA propose to be on line with the values recommended in the IEA 4E SSL Annex Quality tiers[3] and therefore suggest the following maximum standby requirements:
Stage 1 (1. Sep. 2018): 0.3 W
Stage 2 (1. Sep. 2020): 0.2 W
Stage 3 (1. Sep. 2024): 0.1 W

[2] "is smart wireless lighting also energy smart?" Casper Kofoed, Strategies in Light conference, London, Nov. 2016

[3] IEA 4E SSL Annex Quality tiers provides credible SSL guidance and resources to governments and policy makers regarding minimum acceptable product performance levels to support consumer acceptance.

Requirements for luminaires
DEA propose to consider differentiating the requirements depending on the types of luminaires. An up-light luminaire might have a LOR of 100% but this is not an efficient way to provide lighting. The luminaires might be divided in to 4-5 categories each with a pictogram that could be part of the information material.

Smart lamps
Smart lamps enable the user to control the colour temperature. The luminous flux depends strongly on the chosen colour temperature. The figure[4] below shows an example of the measurement of luminous flux related to colour temperature for a smart lamp in full-load mode. For this specific lamp the rated luminous flux (information on the packaging) is 810 lumens. The user is free to select a colour temperature within the interval 2700 – 6000 K. There is no information about the efficiency or the rated luminous flux appearing at 5100 K and that the luminous flux is 500 lumens when the warm white colour temperature 2700 K is chosen.

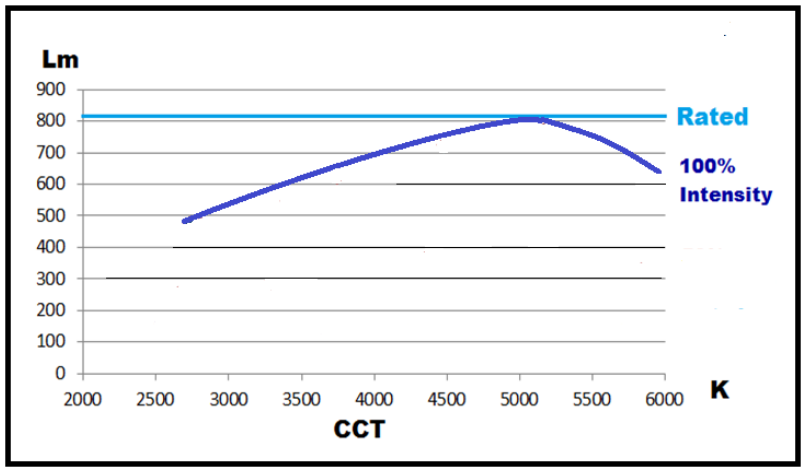

Figure 2 Smart lamps CCT for the rated luminous flux

DEA recommends that the regulation include information requirements for smart lamps on the colour temperature related to the rated luminous flux.

For smart lamps, DEA recommends that the calculation of P_{on} concerning the energy efficiency requirements in Annex II Ecodesign Requirements, Part 1.1 is to be performed for a specified colour temperature (e.g. 3000 K or an average between 2-3 specified colour temperatures). Alternatively, a CCT correction part should be added to the formulary in Part 1.1.

Power factor
The power factor should be depended on the power (W) and not the luminous flux (lm) as in Table 1.

The harmonized standard IEC 61000-3-2 sets power factor requirement for electrical products above 25W

DEA recommends a requirement of PF > 0.5 for power consumption below 25W. This is also the recommendation in all IEA 4E SSL tiers for non-directional and directional lighting sources (updated 2016), in regulation EU 1194/2012, as well as in the EU LED Quality Charter (Feb 2011) This requirement is

[4] Measurements carried out by DTU Fotonics Laboratory in 2015.

fulfilled by products of quality and don't impose extra costs on the products for adding electronics. Higher requirements only include possible disadvantages for the consumer and no measurable benefits for the grid companies.

There is no benefit for consumers from power factor requirements. For the grid company, there are no grid measurements giving evidence of power factor problems in the grid supplying consumers with many CFLs and LEDs.

The CFL/LED active power consumption (lamp and active power grid losses) are the same independent of the size of the power factor. The size of the losses in the grid from reactive and harmonic currents is dependent on the sum of power for all lamps and appliances connected to the actual grid. The reactive load in the grid is often inductive whereas the switched electronics in CFL and LED contribute with capacitive reactive power thus providing the benefit of counteracting the inductive load[5]. The apparent consumption in the grid might in that respect benefit when shifting from halogen lamps to LEDs or CFLs.

Analysing this topic, it is important to note that the consumption per lamp change to be several times lower when shifting from halogen lamps to LEDs regardless of if the size of the PF is 0.5-0.6 (typical value) or higher for the LEDs. In the domestic sector, lighting constitutes around 15-17% of the total consumption. Replacement of halogen lamps by LEDs will reduce the lighting consumption to less than 3-6% of the total domestic consumption. This explains why practical measurements on the total domestic load find no significant noticeable changes due to changing to LED/CFL lighting. The addition of other appliances like a heat pump, washing machine or dish washer impacts the reactive power consumption and harmonic distortion much more.

Addition of a PF corrector-circuit in a LED changing the frequency content might have both positive and negative consequences e.g. Swedish waveform investigations at Luleå University[6] showed that the corrector-circuit reduced the distortion for low-order harmonics but introduced new types of distortion where the practical consequences are unknown. However, the measurements at Luleå at domestic customers, in a hotel and in the laboratory did show that there is no need for requirements for lamps below 25W.

A USAID report[7] reviewed and summarized the current power factor findings available from documented research results from the last 15 years including laboratory research, experimentation, simulation, field installation plus measurements and interviews with researchers and policy experts. This report concludes that the totality of the research to date, and especially field research, has not proved that CFLs or LEDs with high power factor are needed or even beneficial. Current data indicate that a high power factor LED does not deliver any additional value to either the grid-operator or the end-user under most conditions, other than in cases of isolated, micro, or mini grids with high peak lighting loads. The report states that addition of corrector-circuit gives a number of disadvantages:

- Consumes a small amount of additional power,
- Generates a small amount of heat that might speed the failure of other components in the ballast compartment,
- Gives more electronic waste material,
- Can affect the LED reliability as a new potential ballast failure point is introduced,

[5] Effect of low-energy lamps on the grid, Luleå University of Technology, Electric Power Department, 2009 (research supported by STEM, contact person Peter Bennich).

[6] Waveform distortion due to new types of lighting, Luleå University of technology, September 2010.

[7] Power factor: Policy implications for the scale-up of CFL programs, USAID, Dec. 2010

- Might increases the lamp size from the added electronics,
- Adds typically an estimated 15-25 % to the cost.

Energy labelling classes

The DEA welcomes that the labelling classes are based on the efficacy (lm/W) instead of an energy efficiency index.

Class A provides a top level that will be sufficient many years ahead which is preferable as it is disturbing when labelling classes are revised.

It is not desirable that the first two ecodesign stages are in the same energy labelling class. The levels of the classes should be smaller so that the products available on the marked are divided between the classes enabling consumers to differentiate between products and their efficacy. Further it will ease communication about the label and market surveillance authorities when a new requirement stage is reached.

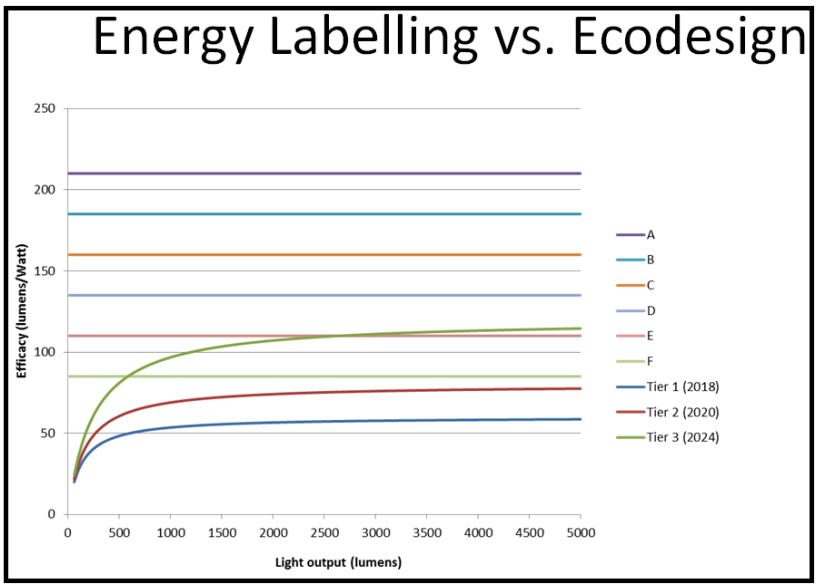

Figure 3 Energy labelling vs. ecodesign