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 des Herstellerverbandes LE ** vom 1. Februar 2016

– Umweltgerechte Produktgestaltung –

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 the Industry Association LE ** as of 1 February 2016

– Ecodesign –

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 de l'association de producteurs LE ** du 1 février 2016

– L'écoconception –

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/

** LE = Lighting Europe; http://www.lightingeurope.org/

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

Stakeholder comments form

LightingEurope comments to the PRELIMINARY DRAFT of COMMISSION REGULATION implementing Directive 2009/125/EC of the European Parliament and of the Council with regards to eco-design requirements for lighting products

Draft

Management summary

Additional energy saving can be achieved based on a new eco design regulation. The way to accomplish it is by focusing new demanding requirements on LED based lighting including considering dimmability (as part of a system approach). Bringing luminaires into scope will contribute to energy saving while it should be noted that the contribution of decorative luminaires will play a role in relation to the more efficient LED sources used.
Changing requirements for non-LED lighting will not deliver impactful additional energy saving while risking a major issue in material efficiency/circular economy through forced luminaire replacement. LightingEurope proposes to maintain the requirements of the present regulations for non LED lighting light sources and control gear (244,245,1194), and to bring their requirements into the future single regulation.

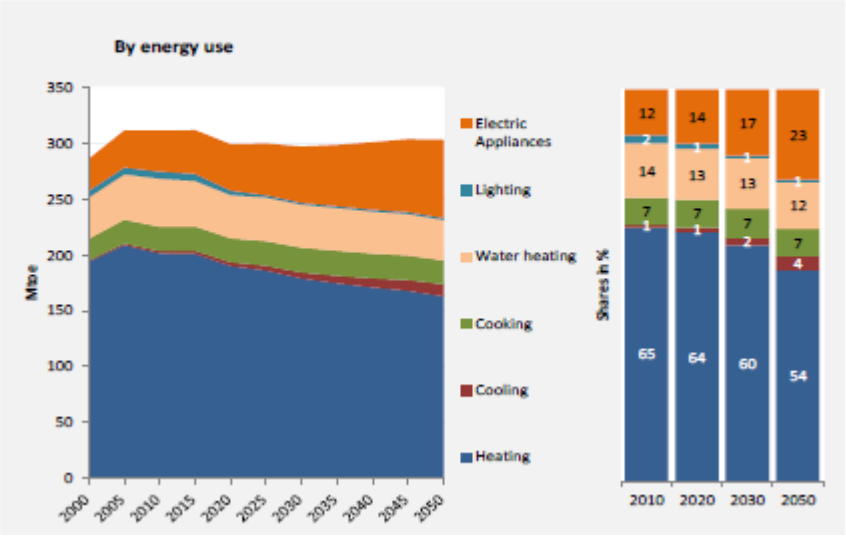
Success and potential of Eco-design directives

The various eco-design regulations the EU has implemented since 2009 (244, 245, 1194) have focussed on the reduction of electrical energy use in light sources. Strong achievements have been made by e.g. banning the incandescent lamps which were used mainly in residential areas. As a result the European energy consumption in 2012 by these consumer lamps has been reduced by 40% compared to 2009 (Figure 1) and residential lighting reduced

to 2% of the total electricity consumption in the EU (Figure 22). Stage 6 of the eco design regulation will come into force per September 2018, so the total achievement in reduction of energy consumption in the residential area will even be bigger.

The big improvements (a Compact Fluorescent lamp uses 80% less energy than an incandescent lamp, so a 100W lamp is replaced by a 20W version) are not foreseen anymore, only incremental steps are possible when looking at the light sources.

FIGURE 22: FINAL ENERGY DEMAND IN THE RESIDENTIAL SECTOR



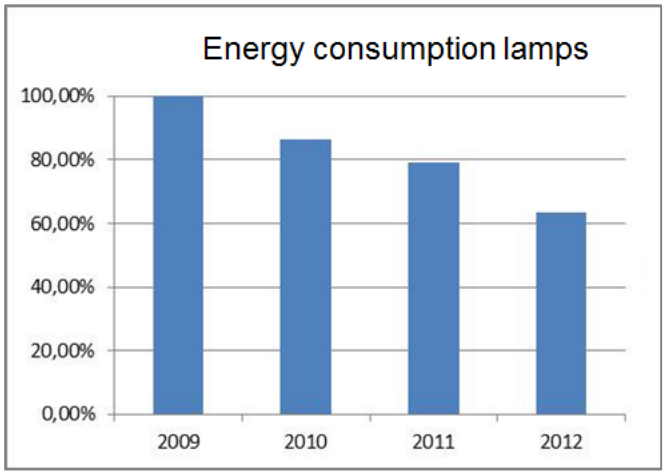


Figure 1 Source: Trends to 2050, EU energy, transport and GHG emissions, Reference scenario 2013 by E3M-Lab, IIASA-GAINS model, IIASA-GLOBIOM Model and EUROCARE, Dec 16 2013.

Both for the residential and even more so for the professional domain, the availability of replacement lamps is an issue.

The LED revolution of the lighting market is in full progress. Many new luminaires which are sold are designed for LED light sources and in some categories these have the largest market share already. The European market also has a large installed park of luminaires (>>3Billion) designed for discharge lamps, which are very efficient long life light sources. The application ranges from professional luminaires for road lighting to luminaires for offices, sports facilities, theatres and luminaires in our homes. These luminaires require new lamps every few years. For some lamps LED based alternatives are designed already, but for many others there will be no alternative.

Forced replacement of working luminaires by new LED based luminaires creates a waste stream of valuable luminaires and puts a huge investment burden on consumers and businesses, and also on municipalities and governments. Worse still, the efficacy targets for LED luminaires in 2018 and 2020 do not even ensure that the replacement LED luminaires will be at least as efficient as the fluorescent or HID luminaires that they replace. A backsliding of system efficacy and/or reduction of lighting quality is possible for consumers who choose low cost LED luminaires over higher performing types whose performance and efficacy genuinely matches or exceeds the classical luminaires that they replace.

The reasons why there are no LED replacement lamps for many currently used discharge lamps can be summarised as follows:
The lamps historically sold are discharge lamps, these efficient lamps operate on dedicated electronic drivers. They lose their heat by thermal radiation towards the front of the lamp. LED lamps have a very different thermal behaviour in which the majority of the heat is radiated through the back of the lamps (heat sink). The electrical and thermal boundary conditions in existing luminaires limit the construction of LED replacement lamps. In addition discharge lamps radiate light in all directions and LED sources tend to use directional light: this provides an opportunity for LED sources to build efficient sources but also generates a problem in the light distribution in existing luminaires.
More specifically:
Electrical operation: The electronic drivers provide a high voltage for ignition (500-5000V) and a supply voltage to power the lamps of around 100V. Many drivers provide a constant power or a constant current. The LED light sources require different drivers and are not compatible with these voltages. This means that exchange of lamps with LED sources requires rewiring of the luminaire or smart conversion electronics to convert the power safely to a signal that is compatible with the LED sources.
Thermal conditions: As the LED's need cooling by conduction and convection (instead of cooling by radiation) it is difficult to design compact LED sources. Especially since many luminaires operate with the lamp in an enclosed space (this is not limiting heat loss by radiation, but is a problem for cooling by convection). Compact LED sources are difficult to design especially for high light fluxes. This means that the fit of these lamps in existing compact luminaires is a problem. In dedicated LED luminaires the construction can be adapted to the cooling needs of the LED sources.
Light distribution: LED replacement lamps for discharge lamps orient the light in many cases in a special direction. This makes the replacement lamps efficient if the light is directed in the right direction. If this is not the case, differences between the intended light distribution and the originally intended distribution of the customer can occur, having impact on the light design.
Variety of lamp types: The last hurdle is the huge variety of the existing lamps in the market. Many lamp types and lamp bases exist. In due course some less popular fit systems will disappear, but there is no program to replace all existing lamps with an LED alternative. Banning these lamps will leave

customers with no other choice than to replace the luminaire creating waste and unnecessary costs, and the potential risk of compromising system efficacy and lighting quality.

LightingEurope Proposal:

Looking at the success of the current eco-design regulations and the issues with replacement lamps, LE promotes to keep the existing requirements in place for non LED technologies. The future significant energy saving potential can be found going beyond the light sources and focussing on the luminaires and use of lighting control devices. To prevent unnecessary waste and investments into luminaires, the proposal is to keep the existing regulations for the replacement lamps and to focus the energy efficiency regulation on new to be installed luminaires, this way delivering on the EU energy saving ambition. Keeping the efficiency requirements of existing regulations in place for non-LED lamps and control gear, enables more strict and forward looking requirements on LED lighting. The currently proposed staged thresholds of 60-80 Lm/W for modules could be increased. Hence LE proposes to set the thresholds to luminaires for general lighting starting with 60 lm/W and adding a correction factor for modules of 1,3 (so-called "malus", first preliminary proposal, maybe subject to change). In the first stage the minimum efficacy of a module shall then be 78 lm/W (first preliminary proposal, maybe subject to change). This allows a fair comparison between an integrated luminaire and a similar one with replaceable LED modules. The correction factor for the module or the replaceable light source has to be applied if the entire luminaire cannot be measured or does not fulfil the requirement. It has to be noted that, due to their very different character and use, decorative luminaires need to be exempted. Therefore a good definition of 'decorative luminaires' is required. A proposal is added to the chapter 'Terms and definitions'.

Even further increases in the currently proposed thresholds (for LED products only) would be supported by LE, on condition that a distinction between directional and non-directional types is made. The former are less efficient than the latter, owing to unavoidable optical losses associated with narrow beam angles. We find it unfortunate that the present draft treats all products alike and is obliged to set rather low efficacy targets so as to avoid a premature and unintentional phase-out of some directional products. Meanwhile, in the major category of non-directional LED products, a very high

proportion are already exceeding the proposed efficacy thresholds. Just as is the case for a regulation that attempts to set common targets for both traditional and LED technologies, treating all LED products alike cripples the regulation in what we believe should be one of its key purposes : to drive the efficacy of the all-important non-directional general lighting LED products towards the still higher efficacies of which they are capable. In parallel,

setting such low blanket requirements across all LED products risks sending a potentially undesirable signal to the rest of the world that Europe is not being especially ambitious or forward-thinking.

Concerning the measurement of directional products, LE wishes to avoid the troublesome requirement for integrated cone measurements as specified in the current Regulation 1194/2012. Instead, we propose to conduct all measurements according to established and standardised methods, accompanied by a simple bonus correction factor for the directional product category.

Creating a wider gap between existing conventional luminaire efficiencies and LED luminaire efficiencies, and setting even more aggressive targets for non-directional LED luminaires, will strengthen the existing market impetus towards energy efficient lighting by generating more attractive pay backs for renovation. As a separate point additional system level energy savings can be obtained by defining appropriate requirements to enabling components like control gear and lighting control devices, using and strengthening the market momentum towards efficient lighting solutions. Control gear efficiencies need to be power dependant, in line with existing regulations, due to principal technology characteristics. The energy efficiency requirements for Lighting control devices are new in regulation and are supporting the EU energy saving targets by enabling energy efficient light to be generated only when needed and in the right amount by means of occupancy and light sensors. Standby power requirements for these devices should be staged to maintain the growth of lighting products with embedded sensors. Towards stage 3 it could be considered to mandate dimmability in new lighting installations as a first step toward intelligent lighting, further supporting the EU energy saving targets by going from efficient lighting to right amount of efficient lighting and only when needed.

Clear scoping of the directive is essential

The proposed regulation covers a very wide scope of lighting equipment. To safeguard clarity of the intended ruling, its scope and to take into account the typical different requirements between these elements, a very well structured framework for the regulation is suggested.
This framework should specify dedicated energy efficiency requirements for 5 different groups:

- Light sources (lamps/modules) which require an external control gear
- Light sources with integrated control gear
- Luminaires

- Control gear
- Lighting control devices

Furthermore sensors could be an optional device with the luminaire.
This should also be well embedded in the terms and definitions.

Preliminary Terms and definitions[1]

The terms and definitions used in the regulation should be consistent throughout the document, preferably matching the EN standards definitions. The terms and definitions should be all in one place and not scattered around the document, to improve readability and consistency of the regulation. A comprehensive list of terms and definitions taking into account the proposals of LightingEurope is given before our detailed comments.
For the LightingEurope team the proposed definitions can be found in the full table of our comments and will be gathered in a separate Table for the EU.

The diagram is a summary of the confusing use of terms mapped onto real products. *Luminaires and light sources requiring control gear are both "Lighting Parts", for which the limits are the same. However there are light losses when such a light source is used in a luminaire, and the power consumption is higher. The current regulation takes control gear losses into account, but the draft does not.*	Proposed clarification of the definitions: • **Electric Light source**: Primary light source that transforms electrical energy into optical radiation (ILV, CIE 017 SP1) • **Electric lamp:** electric light source provided with a cap (IEV 845-07-03, updated = IEC draft 34/182/DC included in running update of IEC vocabulary, IEV ed. 2) • **Luminaire**: apparatus which distributes, filters or redirects the light emitted from one or more light source(s) and which includes, except the light source(s) themselves, all the parts necessary for fixing and protecting the light sources(s) and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply (EN 60598-1, updated = IEC draft 34/182/DC included in running update of IEC vocabulary,

[1] As much as possible we want to align with IEC definitions which are subject to changes currently progressing, therefore we will update these definitions in the future.

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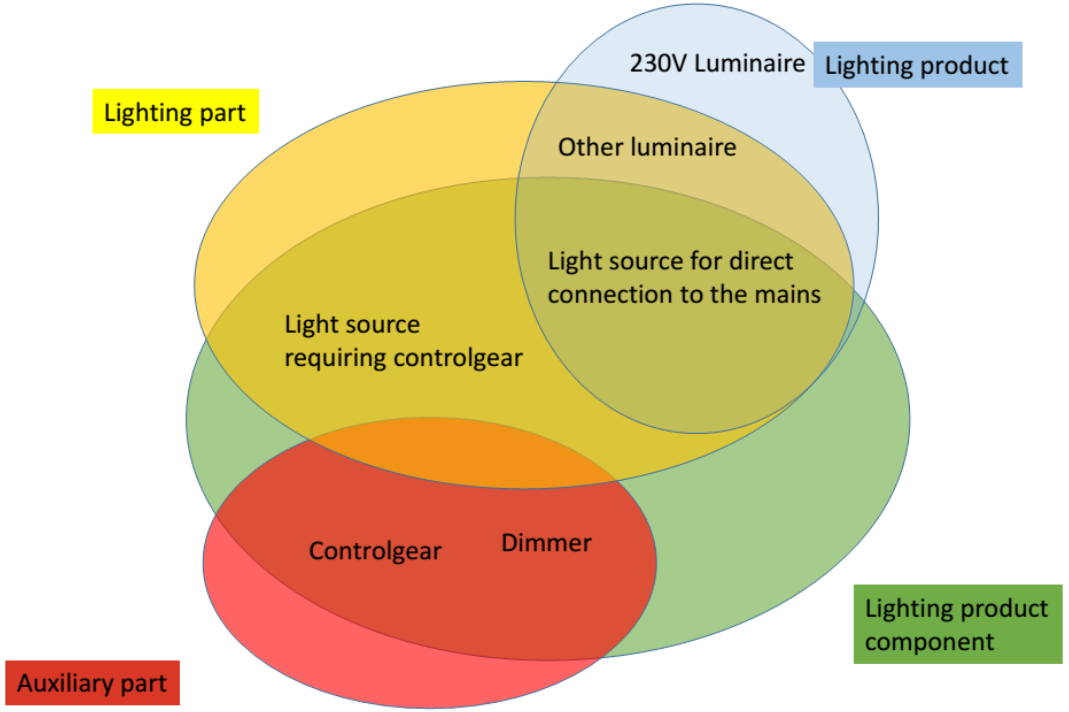


IEV ed. 2)

- **Controlgear (for light source):** unit inserted between the electrical supply and one or more light sources, which serves to supply the light source(s) with its (their) rated voltage or rated current, and may consist of one or more separate components and may include means for dimming, correcting the power factor and suppressing radio interference, and further (control) functions (EN 62504 modified = IEC draft 34/244/DC for running update of IEV)

- **Lighting control device:** electrical devices and techniques used to control process and to regulate switching, luminous intensity and/or chromaticity of the emitted light. **(**keeps the existing definition, article 2, 10, c)

- **Integrated luminaire**: a luminaire with a non-replaceable light source

- **Non-replaceable light source**: light source which is a non replaceable part of the luminaire either because it cannot be replaced without breaking or destroying the luminaire or because it is enclosed under a cover fixed by screw or similar fixing means designed to be used only once and which is not possible to be opened. (EN 60598-1)

- **Decorative luminaires** are designed for their lighted as well as their unlighted appearance and aesthetic contribution to the space. Such luminaires are intended for use where a decorative accent or an aesthetic appearance, not a specified amount of luminaire light output, is desired. The light output of decorative luminaires is not intended to

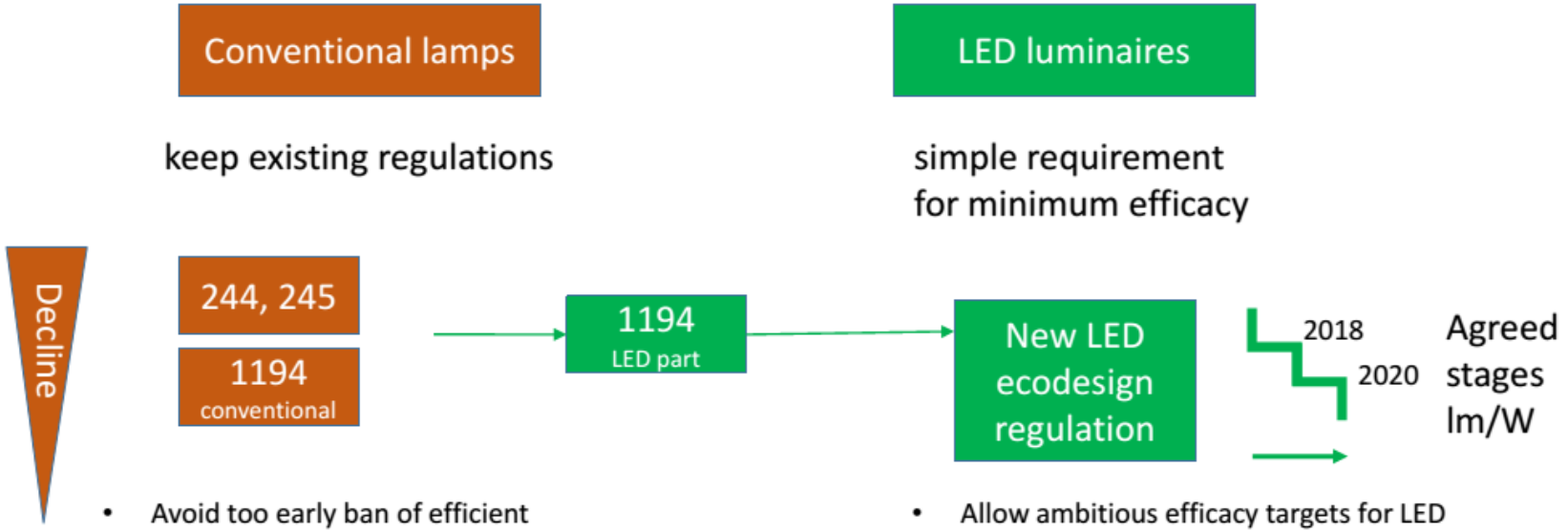
	independently illuminate a space or a task. Decorative luminaires should be substantially visible in the application, and may not be fully recessed into a wall or ceiling (this may also take care of the portable luminaires issue). The technical file of an integrated decorative luminaire should contain documentation that the light sources used in a decorative luminaire fulfil the energy efficiency requirements.

Note : Efficacy varies strongly depending on colour temperature and CRI, the values in the table have to accommodate a low colour temperature and high CRI values.

The following slides give an overview of the LE proposal:

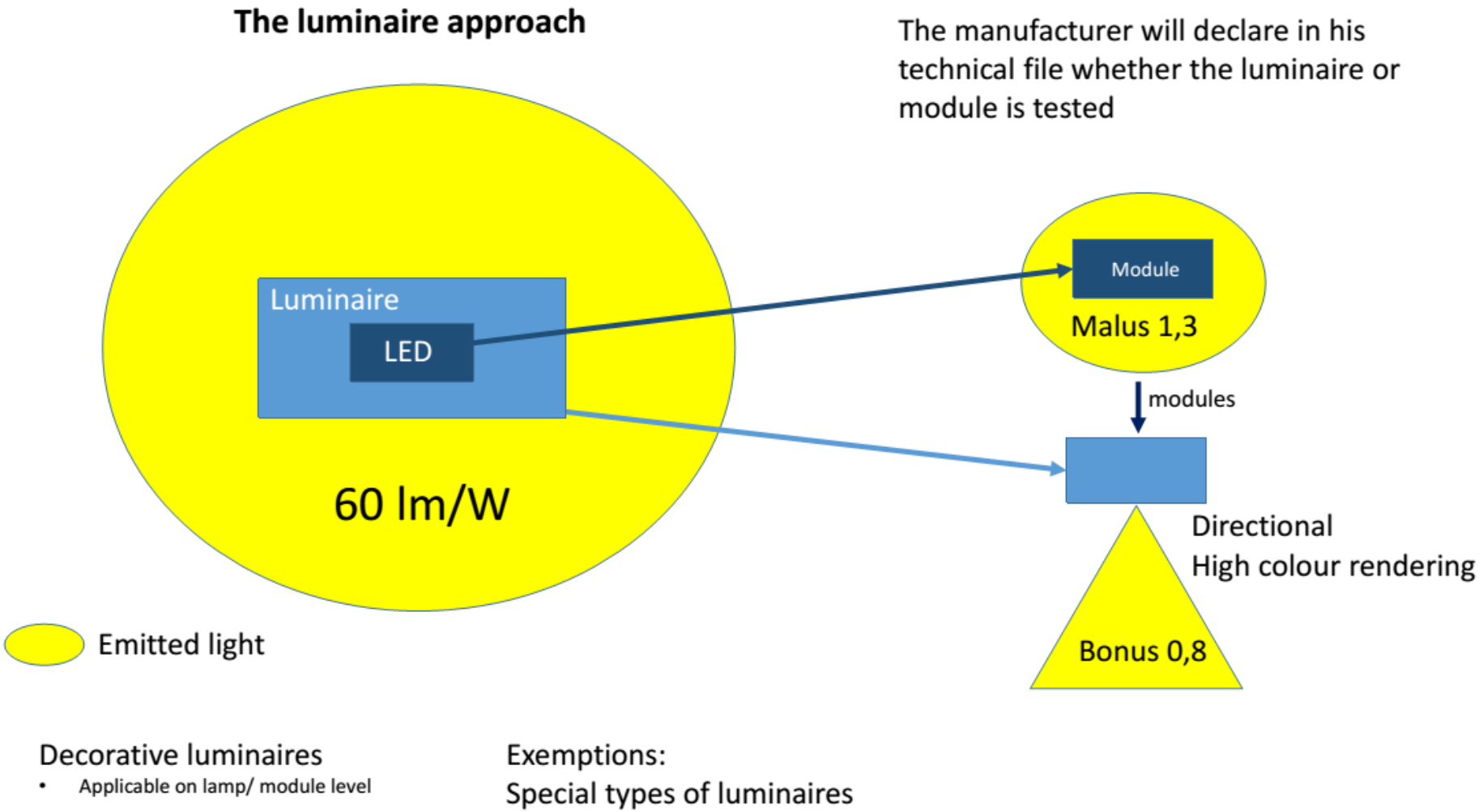
Ecodesign: 1 LR – One Lighting Regulation

Target: Simplify existing and upcoming eco-design requirements for lighting products – a luminaire approach



- Avoid too early ban of efficient conventional lamps
- Allow replacement of efficient lamps in existing efficient luminaires
- Avoid waste from too fast banning

- Allow ambitious efficacy targets for LED sources
- Simplify to luminaire level
- Allow simple surveillance
- Stick only to ecodesign requirements


The luminaire approach
The manufacturer will declare in his technical file whether the luminaire or module is tested
Luminaire
LED
60 lm/W
Module
Malus 1,3
modules
Directional
High colour rendering
Bonus 0,8
Emitted light
Decorative luminaires
• Applicable on lamp/ module level
Exemptions:
Special types of luminaires

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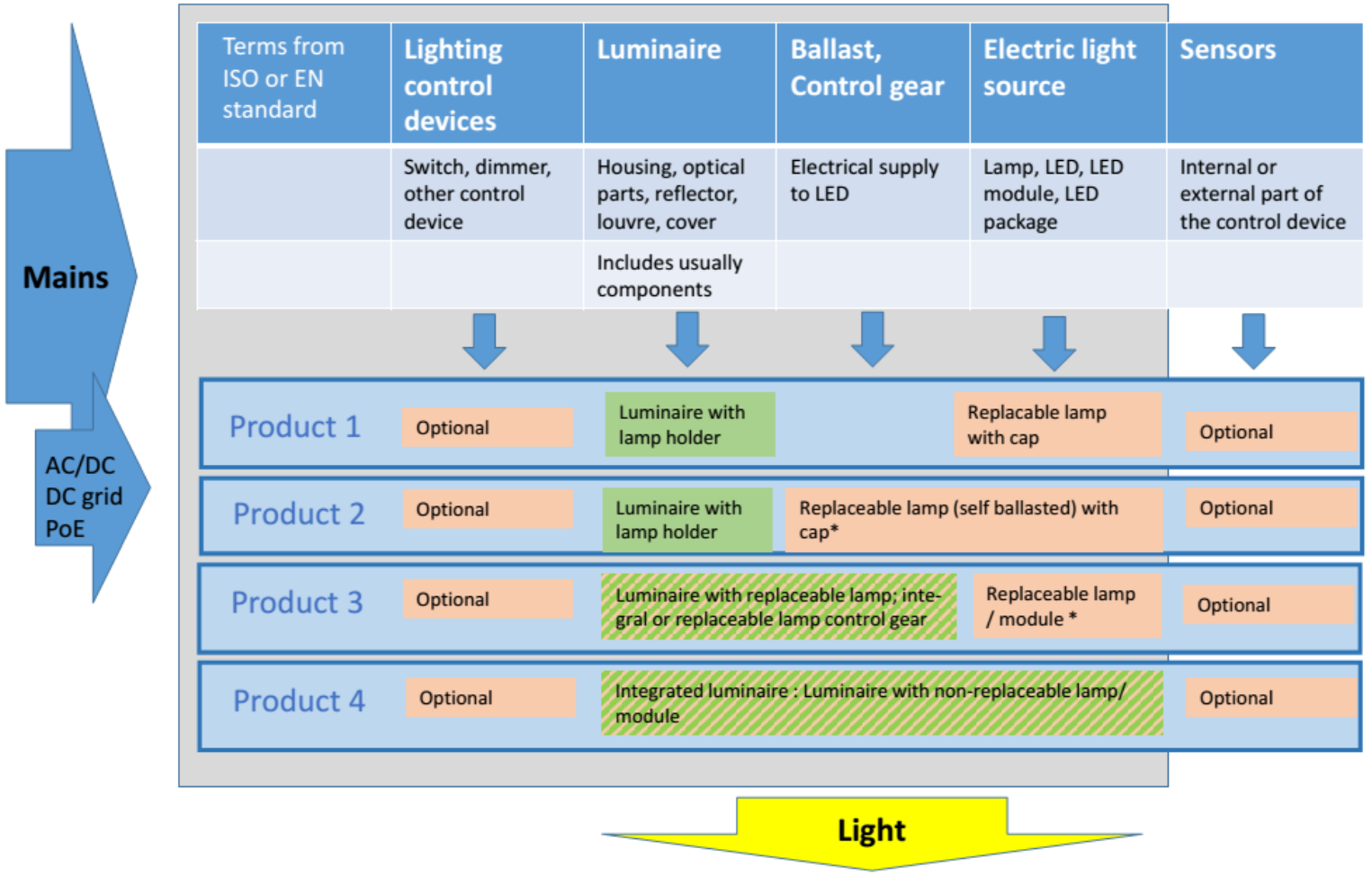

Remark:

A luminaire is a (final) product and not a lighting product component.

„Lighting product components“

Luminaire

Luminaire with lighting components integrated

* Replaceable to be documented: either by the user or by a skilled person

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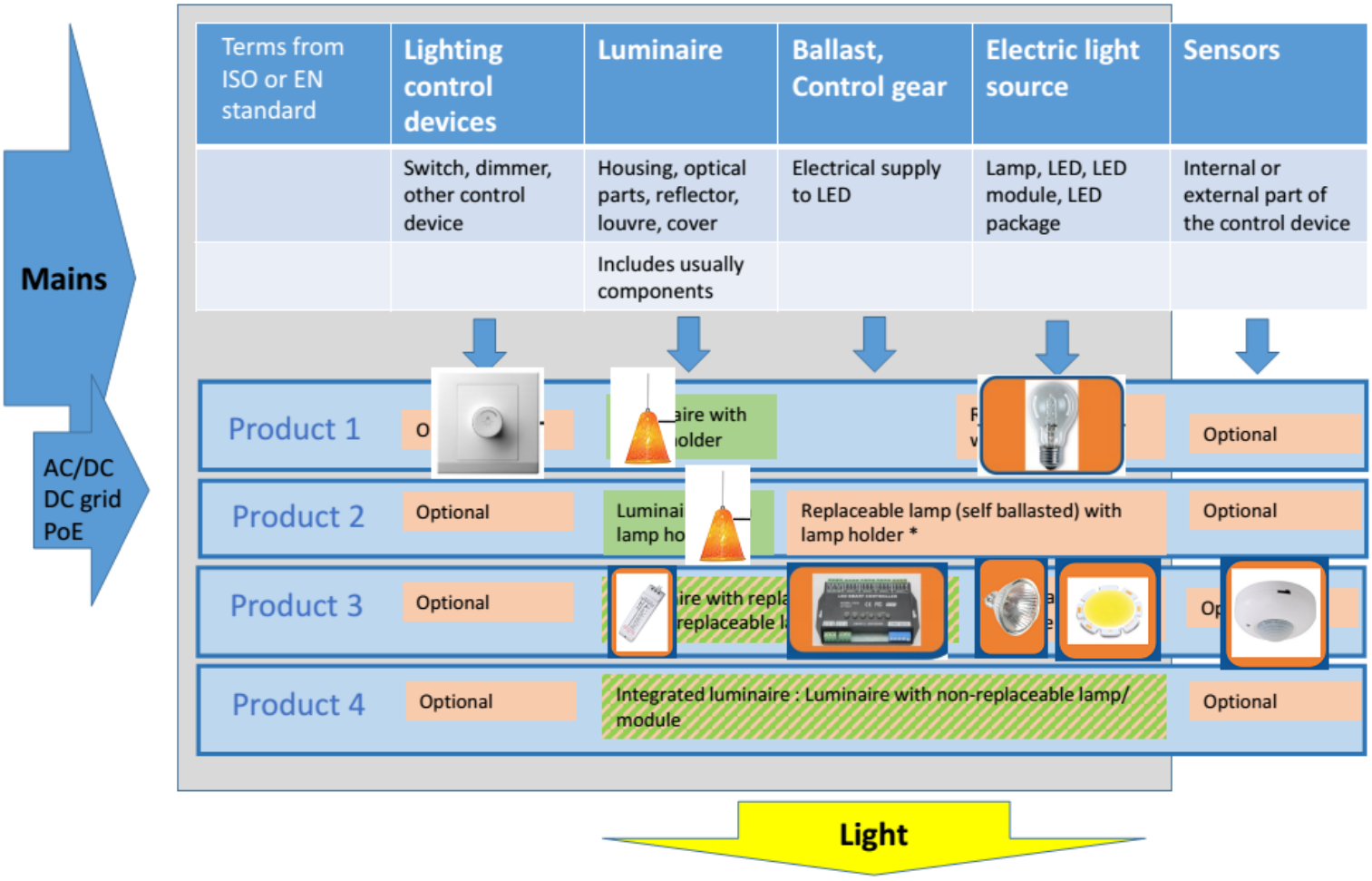

Remark:

A luminaire is a (final) product and not a lighting product component.

„Lighting product components“

Luminaire

Luminaire with lighting components integrated

* Replaceable to be documented: either by the user or by a skilled person

Parameters potentially not relevant in the eco-design regulation

In a regulation targeting purely energy efficiency there is no need to regulate non-efficiency related parameters such as flicker, power factor, warm-up time, mercury content or lifetime/lumen depreciation. This will also serve the purpose of simplifying the regulation and its enforcement.

Comprehensive list of definitions taking into account the proposals of LightingEurope (only LED)[2]

luminous flux	'luminous flux' (Φ) is measured in *lm* and means the quantity derived from radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye.
luminous intensity	'luminous intensity' is measured in cd (Candela) and means the quotient of the luminous flux leaving the source and propagated in the element of solid angle containing the given direction, by the element of solid angle.
chromaticity	'chromaticity' means the property of a colour stimulus defined by its chromaticity coordinates (x and y).
CRI	'Colour rendering' (Ra), which is the effect of an illuminant on the colour appearance of objects by conscious or subconscious comparison with their colour appearance under a reference illuminant.[3]
rated value	Rated value is the quantity value for a characteristic of a product for specified operating conditions. The value and the conditions are specified in documents whose reference numbers have been published for that purpose in the Official Journal of the European Union or assigned by the manufacturer or responsible vendor
final owner	'final owner' means the entity owning a product during the use phase of its life cycle, or any other entity acting on its behalf.
light	'light' means electromagnetic radiation between 380nm and 780nm wavelength and the chromaticity coordinates x and y in the range: $0,2 < x < 0,6$; and $-2,3172\ x^2 + 2,3653\ x - 0,2199 < y < -2,3172\ x^2 + 2,3653\ x - 0,1595$
Luminaire stand-by mode	'Luminaire stand-by mode' is the mode in which the luminaire is still connected to the supply, but the measured light output is essentially zero
Control gear stand-by mode	'Control gear standby mode' means a mode of lamp control gear where the lamps are switched off with the help of a control signal under normal operating conditions. It applies to lamp control gear with a built-in switching function and permanently connected to the supply voltage when in normal use.
Off mode	'off mode' is when the lighting product is disconnected from the mains supply
supply	'supply' is electrical energy delivered to the lighting functionality of the Integrated luminaire, control gear (e.g. mains, low voltage AC or DC, USB, Power over Ethernet etc.)
Lighting functionality	'Lighting functionality' means one or more of the following functionalities:

[2] These are initial definitions proposal which shall be subjected to further improvements. Especially all definitions and requirements related to control gears and control devices are under consideration and will be provided at the earliest possible date.

[3] This definition would be also relevant to parameter Ra which shall be measured according to EN 13032-4 7 Measurement of colour quantities 7.1 Colorimetric Measurements (CIE 13.3, *Method of Measuring and Specifying Colour Rendering of Light Sources)*

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	(a) to transform electrical energy into light (including, but not limited to, lamps and LED light sources); (b) 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); (c) 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).
control gear	'Controlgear (for light source)' means a unit inserted between the electrical supply and one or more light sources, which serves to supply the light source(s) with its (their) rated voltage or rated current, and may consist of one or more separate components and may include means for dimming, correcting the power factor and suppressing radio interference, and further (control) functions (EN 62504 modified)
Stabilised luminous flux	'Stabilised luminous flux' means luminous flux emitted by a lighting product or lighting part measured after ageing and stabilisation as defined in the relevant harmonised standard.
initial luminous flux	'initial luminous flux' means luminous flux emitted by a lighting product or lighting part measured after ageing and stabilisation as defined in the relevant harmonised standard.
Pon	'Pon' means the maximum allowed power that is measured according to the procedures defined in the relevant standards, that is supplied to the lighting part or lighting product under test
Control gear efficiency	The control gear efficiency is defined as (rated lamp power) / (corrected[4] mains input power) in %
Light source	'Electric light source' means a (primary) light source that transforms electrical energy into optical radiation (ILV, CIE 017 SP1)
Lamp	'Electric lamp' means an electric light source provided with a cap (IEV 845-07-03, updated = IEC draft 34/182/DC included in running update of IEC vocabulary, IEV ed. 2)
Luminaire	'Luminaire' means an apparatus which distributes, filters or redirects the light emitted from one or more light source(s) and which includes, except the light source(s) themselves, all the parts necessary for fixing and protecting the light sources(s) and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply (EN 60598-1, updated = IEC draft 34/182/DC included in running update of IEC vocabulary, IEV ed. 2)
Lighting control device	'Lighting control device' means electrical devices and techniques used to control process and to regulate switching, luminous intensity and/or chromaticity of the emitted light (keeps the existing definition, article 2, 10, c)
Integrated luminaire	'Integrated luminaire' means a luminaire with a non-replaceable light source
Non-replaceable light source	'Non-replaceable light source' means light source which is a non-replaceable part of the luminaire either because it cannot be replaced without breaking or destroying the luminaire or because it is enclosed under a cover fixed by screws or similar fixing means designed to be used only once and which is not possible to be opened (EN 60598-1)
Decorative luminaires[5]	'Decorative luminaires' are designed for their lighted as well as their unlighted appearance and aesthetic contribution to the space. Such luminaires are intended for use where a decorative accent or an aesthetic appearance, not a specified amount of luminaire light output, is desired. The light output of decorative luminaires is not intended to independently illuminate a space or a task. Decorative luminaires should be substantially visible in the application, and may not be fully recessed into a wall or ceiling (this may also take care of the portable luminaires issue).
Displacement factor	'Displacement factor' means cos ϕ1, where ϕ1 is the phase angle between the fundamental of the mains supply voltage and the fundamental of the mains current

[4] The corrected mains power is defined in IEC62442.
[5] Decorative luminaire is meant to be provided with compliant LED module

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Organization: LightingEurope	**Proposal for Draft EcoDesign Single Lighting Regulation**	**Date: 2015-02-01**

reference	Page #	Topic	Comment	Proposed change
LE 01	3	(6)	Regulation of hazardous substances should not be part of an energy efficiency regulation. Hazardous substances are covered under RoHS.	Delete this clause
LE 02	3	(12)	Directive 98/34/EC has been superseded in October 2015	Refer instead to Annex I of Regulation 1025/2012/EU
LE 03	4	Article 1 Subject matter and scope	In task 7 on page 16 it is argued that networked lighting systems are part of a parallel effort (lot 37) for regulation. These will be regulated separately. Luminaires are everywhere, they are positioned in strategic places, they contain a power source and can be used efficiently for other than lighting tasks as described below. Luminaires contain more and more functionality not only with regards to lighting and sensors to control the lighting and networking needed for lighting information but also other functions such as: safety (cameras), monitoring climate, communication with customers, Wi-Fi access points. It is proposed to regulate only the power that serves those functions in the luminaire that directly are involved in the lighting function, like the light source, the power regulation for the source, the control functions and the sensors. This regulation should enable the trend that lighting equipment is being used as a housing for non-lighting functionalities. Equipment that used to have an exclusive lighting functionality is now also used to house non-lighting related functionalities e.g. communication equipment, cameras and sensors for other than lighting purposes. Since these functionalities have no relation with the lighting functionality, their energy consumption should not be counted nor should this regulation prohibit the luminaire to be used to house other non-lighting functionalities. In this way lighting can make use of its distribution over an area to be used as an elegant way of "housing" other functionalities. In the first paragraph, a new requirement for "putting into service" has been introduced. This requirement has not been in the present regulations and should not be introduced here. When the regulation enters into force the products placed on the market and in the distribution chain or at the stock of the end user, it should be allowed to be used by the installer and the end user. This requirement would increase the costs of the manufacturers and distributors and shorten the transition period as the products would have to comply well before the deadline to make sure that there	We propose to change: *"This Regulation establishes ecodesign requirements for placing on the market and putting into service of lighting products and lighting product components, including when they are integrated into other products".* To This Regulation establishes lighting functionality eco-design requirements for placing on the market of integrated luminaires, of light sources, of control gear and of lighting control devices when they are integrated into luminaires.

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reference	Page #	Topic	Comment	Proposed change
			are no products left in the distribution chain or at the end user when the regulation comes into force. This requirement would be in practice impossible to survey.	
LE 04	4	Article 1 Subject matter and scope Exclusions:	It is not possible to design a product that can be operated exclusively for specific use like some of those listed (for example, a luminaire designed to operate at an ambient temperature below -20°C can operate also at an ambient temperature higher than such limit). The same consideration is valid for other exclusions. Furthermore in order to avoid problems on the market it is necessary to clearly specify the different examples. 1) One of the exclusions is described under g) electronic displays. As projectors fulfil the same task we consider them as part of this group. To make the regulation clear we propose to add projection to the wording. 2) Pieces of art are excluded from the scope. By its aim, architectural products should be part of this scope exclusion, since they are also designed for aesthetic effects. 3) Theatre and stage lighting should be excluded from scope since LED lamp replacement opportunities are very limited, at the same time they have no significant sales volumes nor significant environmental impact nor present a significant potential for improvement. 4) The following lighting product families should be excluded from scope since they are primarily aimed at generating coloured light for decoration (e.g. city beautification) and not at generating white light for lighting purposes. The RGB technology needed to create coloured light cannot obtain the high lm/w values required for white light due to the nature of the technology. 5) The new regulation should not compromise the safety of emergency lighting. To comply with emergency lighting requirements, replacement lamps must be the same as those for which the luminaire was designed. In addition we must absolutely ensure that the independent energy sources used in emergency luminaire are fully charged to cope with emergency situations. This means that power usage in the situation where there is no light should not be restricted. 6) The colour point of a light source is determined by the light produced in the visible part of the spectrum. The presence of UV or IR radiation does not alter its colour point. This means that a special purpose light source for UV or IR may well have a colour point that is considered as white. We opt for a more adequate definition of special purpose light source as is given by LightingEurope as item (m) in our proposal	Remove from clause: whereas (8) (page 3) The word "exclusively" Amend the exclusion (g) From (g) electronic displays To (g) electronic displays and projection equipment Amend the exclusion (h) From (h) pieces of art To (h) pieces of art and architecture, and their illumination Add: (i) (theatre) stage lighting and entertainment lighting (j) Lighting products with primary function of generating coloured visual radiation and capability to create white light. (k) Emergency lighting (l) Light sources intentionally generating the majority of the electromagnetic

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reference	Page #	Topic	Comment	Proposed change
			by adding an additional description to an existing light definition. This exemption would include products with spectral characteristics similar to the current fluorescent lamps with the following colour designations: Actinicblue Insecttrap BSP (sun tanning). 8) Greenhouse lamps, or lamps specifically designed and labelled for horticultural applications are presently not exempted. 9) For economic, safety and aesthetical reasons it is important to be able service existing lighting installations. Replacement of spare parts should be allowed. 10) The exclusions previously hidden in definition 9 of article 2.	radiation outside the visible part of the spectrum (m) lamps designed for horticulture application (n) spare parts to lighting product which are identical to original parts. (o) integrated decorative luminaires (p) products with CRI < 0 (q) products with luminous flux below 60 lm or above 100 klm (r) products with a minimum luminous flux of 1klm/mm2 of the light-emitting surface's orthographic projection viewed from the direction with the highest luminous intensity, observed at the plane of maximum light flux in the optical system (s) products for polimerisation, ultraviolet light used for curing/drying/hardening, photodynamic therapy Include ALL exclusions as defined in EC 244, 245 and 1194. According to LE proposal, delete Art 1 (i) from the preliminary draft because it is not relevant to LED technology.
LE 05	5	Article 2 Definitions	It is confusing to have terms defined in two places in the regulation (page 5 and page 8).	LE proposes to move all definitions to one place. A full list including new and amended definitions is given earlier in this document. Justifications for changes, new introductions and deletions are given in the comments below.
LE 06	5	(1) luminous flux	There are EN standards for products and measurement methods for both LED and non-LED light sources which adequately describe both ageing (an operating period to give time for various initial chemical or physical processes to occur so that the performance of the light source is more representative of its normal operation than it is immediately after production), and stabilisation (a short operating period under controlled conditions to ensure accurate measurement). Both of these aspects are necessary in order to make reliable, accurate and reproducible measurements as required in item (12) of page 3 of the draft regulation. In the absence of a specific reason not to use the EN standards, the regulation should not make contradictory	Change from: *'luminous flux' (Φ) is measured in lm and means the quantity derived from radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye, and refers to the initial luminous flux of the lighting product after a short operating period if not specified differently* To: 'luminous flux' (Φ) is measured in lm and means the quantity derived from

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			remarks which will only introduce confusion. Definitions (1) to (4) refer to parameters that are to be measured. In definition (1), 'luminous flux', an extra condition is introduced: "after a short operating period." This could easily be misinterpreted, for example as after a few seconds, which would lead to overestimate of luminous flux for LED products. Therefore it is suggested to remove the part of the definition after the comma.	radiant flux (radiant power) by evaluating the electromagnetic radiation in accordance with the spectral sensitivity of the human eye.
LE 07	5	(3) chromaticity	Dominant wavelength and complementary wavelength or purity do not define chromaticity and are not used anywhere in this draft regulation.	LE proposes the following definition: 'chromaticity'means: the property of a colour stimulus defined by its chromaticity coordinates (x and y).
LE 08	5	(6) rated value	Rated values are defined in official EN standards. We would like to keep the original definitions because they define the specific conditions to measure a certain value. E.g. measurement defined at 100 hrs aging and performed with a specified measurement method, reference gear etc.	Change from *(6) 'rated value' means the value of a quantity used for specification purposes, established for a specified set of operating conditions of a product, and all requirements are set in rated values if not specified otherwise.* To: (6) 'rated value' is the quantity value for a characteristic of a product for specified operating conditions. The value and the conditions are specified in documents whose reference numbers have been published for that purpose in the "Official Journal of the European Union" or assigned by the manufacturer or responsible vendor.
LE 09	5	(8) light	It is not clear (also from task 7) why the curves defining white light in the new regulation are made wider. Hence we propose to change the curves definition (i.e. keep old curves except for the lower and higher x limits).	Change the chromaticity range for light From: $0,2 < x < 0,6$; *and* $-2,3172\ x^2 + 2,3653\ x - 0,28 < y < -2,3172\ x^2 + 2,3653\ x - 0,1$. To: $0,2 < x < 0,6$; and $-2,3172\ x^2 + 2,3653\ x - 0,2199 < y < -2,3172\ x^2 + 2,3653\ x - 0,1595$.

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LE 10	5 & 8	(9) lighting product & (10) lighting product component together with annex I (1) lighting part and (2) auxiliary part	These definitions are confusing and require improvement. The difference between light source and luminaire should be preserved but clarified so there is no confusion. The present definition of a lighting product does not make a clear distinction between a "lamp" and a "luminaire". Example a halogen lamp of 230V and 12V. The first one is considered a lighting product, the 12V lamp is considered a lighting product component that needs a transformer. By adding the 'in one assembly' it is clear that the transformer is part of the lighting product. We propose to remove the details of the supply from the lighting product definition, and introduce a separate definition for supply. Many alternative ways to power the lighting system are under development to be able to control the lights more efficiently. This control allows more efficient use of the light. The requirement of 230V/50Hz as energy source is not future prepared. We see and expect more and more lighting equipment to be powered by other power sources, like DC power, USB or Power over Ethernet (PoE). These power supplies are already covered under other regulation. By introducing a more generic term like 'supply' this issue can be solved, see proposed definition of 'supply' and 'lighting functionality'. A lighting product component in the draft regulation can be understood as an electrical light source designed to operate directly at the mains, or it can be a device like a control gear, transformer or converter, or it can be a device for regulating or switching the circuit. This device can be an additional unit in the light source circuit or it can be integrated in the control gear or converter to operate light sources designed not to be connected directly to the mains. The definition of auxiliary part contains the following products: (1) 'Control gear' such as ballasts and electronic lamp drivers (2) 'Lighting Controls devices', such as light sensors devices intended to change light level by giving a signal to the control gear, controls devices intended to control light through occupancy sensing and by wireless communication. In Annex II eco-design requirements can be created for these two categories of devices.	Remove definitions 9 and 10 and introduce the following: • **Electric light source** (primary) light source that transforms electrical energy into optical radiation (ILV, CIE 017 SP1) • **Electric lamp** electric light source provided with a cap (IEV 845-07-03, updated = IEC draft 34/182/DC included in running update of IEC vocabulary, IEV ed. 2) • **Non-replaceable lightsource** light source which is a non-replaceable part of the luminaire either because it cannot be replaced without breaking or destroying the luminaire or because it is enclosed under a cover fixed by screws or similar fixing means designed to be used only once and which is not possible to be opened (IEC 60598-1, ed. 8.0 (2014-05)) • **Luminaire** apparatus which distributes, filters or redirects the light emitted from one or more light source(s) and which includes, except the light source(s) themselves, all the parts necessary for fixing and protecting the light sources(s) and, where necessary, circuit auxiliaries together with the means for connecting them to the electric supply (EN 60598-1, updated = IEC draft 34/182/DC included in running update of IEC vocabulary, IEV ed. 2) • **Integrated luminaire** a luminaire with a non-replaceable light source • **Decorative luminaire** Decorative luminaires are designed for their lighted as well as their unlighted appearance and aesthetic contribution to the space. Such luminaires are intended for use where a decorative accent or an aesthetic appearance, not a specified amount of luminaire light output, is desired. The light output of decorative luminaires is not intended to independently illuminate a space or a task. Decorative luminaires should be substantially visible in the application, and may not be fully recessed into a wall or ceiling (this may also take care of the portable luminaires issue)". • **Lighting control device** electrical devices and techniques used to control process and to regulate switching, luminous intensity and/or chromaticity of the emitted light • **Control gear for light source**

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				unit inserted between the electrical supply and one or more light sources, which serves to supply the light source(s) with its (their) rated voltage or rated current, and may consist of one or more separate components and may include means for dimming, correcting the power factor and suppressing radio interference, and further (control) functions (EN 62504 modified) • **Supply** 'supply' is electrical power delivered to the lighting functionality of the Integrated luminaire, control gear (e.g. mains, low voltage AC or DC, USB, Power over Ethernet etc.) • **Lighting functionality** one or more of the following functionalities: (a) to transform electrical energy into light (including, but not limited to, lamps and light emitting diodes); (b) 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); (c) 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).
`LE 11	5 or 8	Missing definitions	These parameters are essential to the reading of the regulation and are not defined. P_{on} stand-by off-mode control gear efficiency	Introduce the following definitions: • **P_{on}** the maximum allowed power that is measured according to the procedures defined in the relevant standards, that is supplied to the product under test • **stand-by** the mode in which the product is still connected to the supply, but the measured light output is essentially zero • **control gear stand-by mode** a mode of lamp control gear where the lamps are switched off with the help of a control signal under normal operating conditions. It applies to lamp control gear with a built-in switching function and permanently connected to the supply voltage when in normal use. • **Off-mode** when the lighting product is disconnected from the mains supply • **control gear efficiency** still under consideration

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LE 12	6	Article 3	The rapid changes in the technology and the lighting market make it unreasonable to set eco-design requirements now for 2024.	Remove the reference to stage 3
LE 13	7	Article 7	Additional energy saving can be achieved based on a new eco- design regulation. The way to accomplish is by focusing new demanding requirements on LED based lighting including considering mandatory dimmability (as part of a system approach). Changing requirements for non-LED lighting will not deliver impactful additional energy saving while risking a major issue in material efficiency through forced luminaire replacement.	LE proposes to change text to the following: The requirements in the following Commission Regulations for LED products (light sources and control gear) shall be repealed and the requirements following Commission Regulations for non-LED products (light sources and control gear) shall be maintained and included in this new regulation.
LE 14	7	Article 8	The rapid changes in the technology and the lighting market make it unreasonable to set eco-design requirements now for 2024.	In addition to removing stage 3 , bring forward the review date to 1st September 2022
LE 15	8	ANNEX I (3) Power Factor	Definition of 'Power Factor' should be replaced by definition of "Displacement factor" It is EU M519 which tasked the SDO's to split the 'Power Factor' in the displacement - and distortion – factors.	LE proposes to replace the term 'Power Factor' with displacement factor, having the following definition: displacement factor: 'displacement factor' is expressed by cos ϕ_1, where ϕ_1 is the phase angle between the fundamental of the mains supply voltage and the fundamental of the mains current.
LE 16	8	Annex I (4) 'stabilised luminous flux'	This term is only referred to in the other definitions on page 8. It is almost equivalent to the term "initial luminous flux" which is used in many EN light source standards. The measurement of initial luminous flux is made after both an ageing period (to give time for various initial chemical or physical processes to occur so that the performance of the light source is more representative of its normal operation than it is immediately after production) and a stabilisation period (a short operating period under controlled conditions to ensure accurate measurement). The definition in point (4) demands 10 hours of continuous operation. This may be too short or too long for adequate ageing, depending on the technology of the product, and is too long for stabilisation, occupying the measurement equipment for an unnecessarily long time. It would be preferable to align with terms and definitions used in the relevant standards.	LE proposes the following definition: initial luminous flux: luminous flux emitted by a lighting product or lighting part measured after ageing and stabilisation as defined in the relevant harmonised standard.
LE 17	8	(5) warm-up time	It is very difficult to find a correct definition of warm-up time. Thereby it varies for different lamp types. E.g. HID takes a long for ignition, where LED lights instantaneous light up. For both lamps it is not relevant to mention warm-up time, since it is a known characteristic for the type of lamp and accepted by the market. Furthermore the clause on warm-up time was only taken into the regulations because of the technology-specific issue with CFL in retail sales channels. In view of the current dramatic and predicted	LE proposes to remove the warm-up time definition

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			further demise of this light source in retail channels, especially leading up to the September 2018 start of the new regulation, the removal of this functionality requirement is justified. See also comments on Table 1 of ANNEX II	
LE 18	8	(7) Failure rate	The regulations is intended to minimize energy use. Other product performance quality factors should not be regulated. Moreover, since the regulation has no minimum requirement for life time, it is illogical to define an associated failure rate. See also comments on Table 1 of ANNEX II	LE proposes to remove the definition of Failure rate.
LE 19	8	(8) Flicker	Flicker is not an eco-design issue Furthermore the proposed flicker limits would render a majority of products (including LED) immediately obsolete, which is hopefully not the intention of the regulator. In view of the fact that there are several different metrics for flicker and no agreed or standardised limits, LE is not (yet) in a position to propose a workable alternative.	LE proposes to remove the definition of flicker.
LE 20	8	(9) Accelerated endurance testing	The accelerated endurance tests of annex II and annex IV are not appropriate (see detailed comment to annex IV)	LE proposes to remove the definition of accelerated endurance testing
LE 21	*9*	*Annex II* *1.*	In order to have one requirement for both lamps and luminaires, in case the light source cannot be replaced it is advised to change wording to avoid that also luminaires with replaceable light sources are covered and as such for the light sources double requirements would apply. See proposed definition. In the circular economy concept replacement parts are important. We therefore advise to put the accent of the regulation on light sources. Next to having energy efficient light sources, it is expected that 30% additional energy saving can be obtained by using lighting in a smart way, in other words by adding controls functionality to lighting products. This intelligence, like occupancy sensors and light sensors, does require a little energy to function. The present draft regulation does not allow for any energy consumption of these controls devices and as such will strongly hamper smart lighting getting to market. As it is understood by LightingEurope, at the moment the 0.5 W standby losses apply	Please refer to earlier proposed definitions : replace the ANNEX clause 1.1 with the following text: **1. ENERGY EFFICIENCY REQUIREMENTS** **Integrated Luminaires (For non-LED light sources the existing regulations are to be continued.)** *1.1.1. Stage 1* As from stage 1 onwards, the following energy efficiency requirements shall apply to luminaires: (1) The maximum allowed rated power[6] consumption (P_{on}) for the lighting functionality shall be in full-

[6] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

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			to components as defined in 10(a), 10(b), and 10(c). Once these components are assembled into a luminaire, this should be considered a lighting product according to definition (9), which has a standby requirements of 0.5 W according ANNEX II, 1.1.1 (2). With control gear having standby of 0.5 W it means that there is no energy available any more for controls devices integrated in a luminaire. It is the first time the industry is faced with requirements for lighting controls functionality and it will need time to adopts its product to new regulation of lighting controls devices, so we propose to have this also staged. In order not to have too high allowances for lamps, we propose a power level at which the allowance changes. In this way the standby energy of lamps versus higher power luminaires can be handled. This regulation should enable the trend that lighting equipment is being used as a housing for non-lighting functionalities. Equipment that used to have an exclusive lighting functionality is now also used to house non-lighting related functionalities e.g. communication equipment, cameras and sensors for other than lighting purposes. Since these functionalities have no relation with the lighting functionality, their energy consumption should not be counted nor should this regulation prohibit the luminaire to be used to house other non-lighting functionalities. In this way lighting can make use of its distribution over an area to be used as an elegant way of "housing" other functionalities. It should be noted that even with a lower efficiency the lighting system uses less energy if it is operated in a "smarter way", e.g. for a shorter time. LightingEurope would like to illustrate this on an example: An office luminaire with 2 x 32W TL-D lamps operating for 8 days a week (3000 hours) uses 213 kWh including the 10% control gear losses. If the sensors are capable of shutting off the lights for only 10% of the time the system uses 21kWh less. This should be compared with the energy use of the sensors for instance 13kWh (If the sensors are on 24 hours a day 365 days a year and use 1.5W). If the lights are additionally dimmed during sunny periods the	load mode for a rated luminous flux and colour rendering index: $\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{60}\right) * \frac{CRI + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{60}) W$ (2) The maximum allowed rated power[7] consumption for the lighting functionality in stand-by mode (P_{sb}), if existing, shall be P_{sb} = 3 W. (3) There shall be no allowed rated power[8] consumption in off-mode. *1.1.2. Stage 2* As from stage 2 onwards, the maximum allowed rated power[9] consumption (P_{on}) for luminaires shall be in full-load mode for a rated luminous flux and colour rendering index: (4) The maximum allowed rated power[10] consumption (Pon) for the lighting functionality shall be in full-load mode for a rated luminous flux and colour rendering index:

[7] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[8] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[9] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[10] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

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			energy saving can be even higher. Making sure that the lighting systems are off when they are not required (e.g. by using motion sensors), even at the cost of some additional power use, is very beneficial to the environment. The system efficiency is reduced, in this case lm/W value drops from 74 lm/W for the lighting system to 69 lm/W for the system including the 1.5W "standby" power use. Another factor that LightingEurope would like to comment and propose changes is correction related to colour rendering index (CRI). Since the human eye is not as sensitive at each wavelength, lamps with high CRI need more power. This power is needed to generate light for instance in the red region of the spectrum to give a good impression of red colours but the light does not add to the overall efficiency to generate lumen. The proposed regulation does limit the design of efficient light sources for outdoor applications where visibility that creates safety environment is of more importance, than colour rendering. Visibility can be improved by optimizing the colour of the light to the mesopic part of the spectrum but colour rendering is not the main parameter. If the regulator allows low colour rendering lamps matching visibility sensitivity in outdoor lighting efficiency gains it can be expected that more efficient light sources can be designed. LightingEurope could supply relevant recent scientific literature if requested. On many European roads high pressure sodium lamps are used for lighting. These are very efficient sources, with lower, but still good enough colour rendering for this application. Since no equivalent retrofit LED lamps exist, the proposed regulation would force municipalities and governments to take out good luminaires and replace them with new LED luminaires. This should be considered from environmental, safety and economic (budget availability) perspective. The need to replace still, well operating luminaires will cause a large unnecessary waste stream, , but will also create a significant investment burden for (e.g.) municipalities since this outdoor lighting needs professional watertight, storm and lighting resistant luminaires. In case	$\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{tbd}\right) * \frac{CRI + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{tbd}) W$ (5) The maximum allowed rated power[11] consumption for the lighting functionality in stand-by mode (P_{sb}), if existing, shall be P_{sb} = 3 W. **1.2. light sources with integrated control gear (For non-LED light sources the existing regulations are to be continued.)** *1.2.1. Stage 1* As from stage 1 onwards, the following energy efficiency requirements shall apply to integrated light sources: (6) The maximum allowed rated power[12] consumption (P_{on}) shall be in full-load mode for a rated luminous flux and colour rendering index: $\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{n}\right) * \frac{CRI + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{n}) W$

[11] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[12] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

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			of unplanned single lamp malfunction, when replacement lamps are not available, part of streets and outdoor places may remain dark, leading to lower safety. LightingEurope would also like to refer to the latest DoE reports, where it was decided not to regulate HID lamps in the US . Next to that it was noted that "The CRI of HID lamps varies based on lamp technology, application, and the environment in which the lamp is designed to operate. DoE found that changing the CRI did not have a predictable effect on efficacy."DoE preliminarily determined not to use CRI as an equipment class-setting factor".The specific exemptions from this rule were noted, however they are not related to outdoor lighting. LE proses to use correction factors when the lm/W stages are applied for luminaires: a) for modules tbd ("malus") b) for directional luminaires and lamps: tbd ("bonus")	(7) The maximum allowed rated power[13] consumption in stand-by mode (P_{sb}), if existing, shall be P_{sb} = 0,5 W. (8) There shall be no allowed rated power consumption in off-mode. *1.2.2. Stage 2* As from stage 2 onwards, the maximum allowed rated power consumption (P_{on}) for integrated light sources shall be in full-load mode for a rated luminous flux and colour rendering index: (9) The maximum allowed rated power[14] consumption (Pon) shall be in full-load mode for a rated luminous flux and colour rendering index: $\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{n}\right) * \frac{\text{CRI} + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{n}) W$ (10) The maximum allowed rated power[15] consumption in stand-by mode (P_{sb}), if existing, shall be P_{sb} = 0,5 W.

[13] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[14] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[15] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

				1.3. Light sources (For non-LED light sources the existing regulations are to be continued.) *1.3.1. Stage 1* As from stage 1 onwards, the following energy efficiency requirements shall apply to light sources: The maximum allowed rated power [16]consumption (P_{on}) shall be in full-load mode for a rated luminous flux and colour rendering index: $\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{n}\right) * \frac{CRI + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{n})W$ *1.3.2. Stage 2* As from stage 2 onwards, the maximum allowed rated power consumption (P_{on}) for integrated light sources shall be in full-load mode for a rated luminous flux and colour rendering index: The maximum allowed rated power [17]consumption (Pon) shall be in full-load mode for a rated luminous flux and colour rendering index: $\text{Indoor: } P_{on} = \left(2 + \frac{\Phi}{tbd}\right) * \frac{CRI + 240}{320} W \quad \text{Outdoor: } P_{on} = (2 + \frac{\Phi}{tbd})W$

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LE 22	9	1.2. Auxiliary parts	"allowed minimum energy efficiency in full-load mode shall be 90%." For both non-LED and LED technologies, lower wattage and efficiency of >90% is very complicated (very high cost, for low absolute efficiency gains) or cannot be achieved, especially if also power factor needs to be >0.9. This is recognized in current stage 3 of EC 245/2009 This is not sufficiently covered by the constant "2" in the P_{on} formula, because that is covering for lamp length effect, not for lamp drivers. For low wattages both lamp and driver efficacies are lower compared to higher wattages. We propose to keep the current, wattage dependent, efficiency requirement from the stage 3 of 245/2009. Example: increasing fluorescent driver efficiency would for the total European market result in 16 million kWh energy savings annually. In terms of costs: the energy saving would be 4 million Euro, just offsetting the 3 million Euro extra material costs which are needed to make non-complying lamp drivers more efficient(*). Similar calculations can be done for LED. In these calculations, the power factor is not yet brought to 0.9, so in reality, considerable extra costs will still have to be added. (*) Estimation based on 2015 annual sales and ZVEI market shares. We assume that shares for the low wattage drivers are equal to the overall shares. Also, we assume burning times relevant per application. 'Lighting Control devices' requirements previously covered by 1194/2012 will be replaced by new LE proposal.	Following the new text replacing Annex 1, clause 1.1 in the previous comment, replace Annex 1 clause 1.2 with the following text: 1.4 LED Control gear The currenly proposed value of 0,9 should be adjusted according to power consumption because low power drivers are less efficient than high power drivers. LE requests a reasonable time period to propose new values. (2) The maximum allowed rated power consumption in control gear stand-by mode (Psb), if existing, shall be Psb = 0,5W. (3) There shall be no allowed rated power consumption in off-mode. 1.3 Lighting Control devices As from stage 1 onwards, the following energy efficiency requirements shall apply to lighting control devices: (1) Stage 1 The maximum allowed rated power consumption in luminaire stand-by mode (Psb), if existing, shall be Psb = tbd . (2) Stage 2 The maximum allowed rated power consumption in luminaire stand-by mode (Psb), if existing, shall be Psb = tbd .
LE 23	9/10	Annex II 2	Functionality requirements should be clarified according to the revised definitions proposed.	Tbd

[16] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

[17] LE questions the use of "rated power". Seek confirmation on Commission's intentions for this and similar occurences.

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			In view of findings published in task 7 the warm up time would not be defined. The requirements as formulated at present, will ban very efficient lamps among others metal halide lamps and even the mercury free high pressure sodium (HPS) lamps. It is unclear why this requirement is added, since existing lamps fulfil the customer needs in many applications. There is no equivalent (LED) lamp replacement for these lamps. Banning the HPS and metal halide lamps would force governments and professional customers to purchase new luminaires causing unnecessary waste and a huge investment hurdle. LE propose to keep the functionality requirements of existing Regulations for non-LED products. Warm-up time is not relevant for LED lamps which give "instant full light" according to the definition in the current regulation 1194. LE proposes to delete the requirements for warm-up time from table 1 Determining whether a product will be used in outdoor or industrial applications opens a loophole. We consider specifying by lumens is a more robust requirement. LE propose to keep the functionality requirements of existing Regulations for non-LED products For new products (LEDs) below 2000 lm (tbd) we propose a minimum CRI tbd; above 2000 lm (tbd), no requirements[18] We propose to keep the functionality requirements of existing regulations for non-LED products. Power factor is also not the appropriate metric; see LE position paper on displacement factor; distortion factor is already regulated by the EMC directive. Distortion factor applies only to lighting products (luminaires, integrated lamps at full light output). LE proposes to specify displacement factor rather than power factor. It is identified in Task 7 that effective market surveillance is a key to the effectiveness of a new regulation. Lifetime testing of products places a burden on market surveillance. The draft regulation attempts to solve this by introducing "accelerated endurance testing" in annex IV. Any accelerated testing should reliably simulate the real performance of a product through life. Otherwise there is a danger that introducing a requirement to comply with a test that does not have a sound technical basis would encourage development of products purely to pass the test and not to	

[18] The intent of the CRI requirement is to protect the consumer end-user from low CRI products. Full proposal to be provided later.

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			give a better performance to end users. Accelerated testing requires a knowledge of failure modes and judicial use of relevant acceleration factors. The fact that manufacturers of conventional lamps continue to test their products to full lifetime is evidence that the choice of these acceleration factors and assessment of their effects is very difficult. The tests proposed in Annex IV are taken from IEC 62612 (performance of self-ballasted LED lamps). The tests in the standard are designed to test certain features of LED lamps that are not present in other lighting products and lighting product components. In addition, the text of the draft regulation omits the warnings given in IEC 62612 and the acceptance criteria in table 1 are much more severe than in the standard. The tests also require the use of expensive thermal cycling equipment that may be not available for market surveillance authorities. It is clear that there is no "one size fits all" method, and setting reliable accelerated testing criteria would require detailed technical consideration for each type of product. For this reason and for effective market surveillance it is recommended that the requirement for accelerated testing is removed.	
LE 24	11	3.1	The regulations should acknowledge that lamps and luminaires need to supply customers with different information (e.g. a luminaire with a replaceable lamp can provide different colour temperatures with different lamps. The same holds for consumer and professional applications .	For professional products this information should only need to be provided in commercial information and on websites.
LE 25	11	3.1 Information to be displayed on lighting product or lighting product component *3.1.1.Lighting products and lighting parts*	The title of 3.1.1 should be changed to align with the new proposed definitions Rated vs nominal Align with the IEC/EN definitions of the nominal and rated value, where rated is real performed value, e.g. the average flux as published on the technical spec sheet of the manufacturer. See for example IEC (EN) 60081, section 1.4.4.3&4 and article 2 (5&6) The combined CRI and colour temperature information is marked on many products as a 3-digit code. This should be allowed to continue. In professional luminaire business the beam angle is not used as a per se preselection process (except flood lighting), as the beam angles are part of the lighting distribution that is assessed/used in lighting calculation software to land at the best solution. So the beam angle is not something that is specified, and certainly not in the context of the energy efficiency assessment. Especially when we refer to LED modules, this is irrelevant, as the beam angle will be created by the secondary optic of the luminaire.	Minimum product information requirements to be discussed.

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LE 26	11	3.1.2 Auxiliary	Rated vs nominal Align with the IEC definitions of the nominal and rated value, where rated is real performed value, e.g. the average flux as published on the technical spec sheet of the manufacturer. See IEC 60081, section 1.4.4.3&4 and article 2 (5&6). Rename from 'auxiliary part' into 'control gear' since many requirements are not applicable to 'lighting controls devices'.	To be replaced by: …. the **rated** efficiency in full-load mode…. Rename from 'auxiliary part' into 'control gear'
LE 27	11	**3.2.Information to be visibly displayed on the packaging** *3.2.1. Lighting products and lighting parts*	Rated vs nominal Align with the IEC definitions of the nominal and rated value, where rated is real performed value, e.g. the average flux as published on the technical spec sheet of the manufacturer. See IEC 60081, section 1.4.4.3&4 and article 2 (5&6) For lighting parts the number of switching cycles cannot be defined in general: it depends on the used gear, the use of a representative switching cycle frequency etc. Therefore any values published provide non- or wrong information and should be left out until a well-defined standard is in place.	To be replaced by: the **rated** luminous flux is at least twice as large as any display of the nominal power; the colour temperature in *K* and also expressed graphically or in words; the **rated** CRI; allow marking of 3 digit code as specified in IEC TR 62732 a warning if the product or part cannot be dimmed or can be dimmed only on specific dimmers;
LE 28	12	Annex II, 3.2.1 (d) and 3.2.2 (c) Information on packaging	The number if switches is very dependent on control gear that is used, hence cannot be easily communicated (standardized), no reference ballast for switching cycle known at this moment and no work in progress on this item.	Remove the requirement
LE 29	12	3.3.1 (b)	Not every product is a cylinder	Reword to: The principal outer dimensions in mm
LE 30	12	3.3.1 (d)	UV is not an eco-design issue. There are UV safety requirements covered by the LVD and the harmonised light source standards have optical radiation safety requirements covering UV and blue light hazard. A) A first investigation shows that sunlight penetrating windows in northern countries contains more than 5% percent UV in the spectrum (outside more than 10%). B) Also lamps which are factor 10 under all requirements for photo-biological hazard (as defined in IEC62471) still could have ~4% UV as total spectrum; C) The criterion of total UV radiation is not relevant; it should be weighted by the damage factor of the individual wavelength as is done in IEC 62471 D) The limitation to 0.1 % & warning seems out of place	Remove the requirement
LE 31	12	3.3.1 (e)	Flicker is not an eco-design issue.	Remove the requirement.
LE 32	12	3.3.1 (f)	Power factor, if at all relevant, is only relevant for the power factor seen at the mains and so only applicable to lighting products and not lighting product components. As an example a lighting component can be a magnetic ballast or a compensation	Replace with displacement factor

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			capacitor, both have on themselves a low power factor. As an assembled system in a luminaire along with the lamp and the ignitor, they are designed to have a good power factor. The power factor for electrical equipment is regulated at least partly as harmonic interference by the EMC directive (2014-30-EU).	
LE 33	12	3.3.1 (i)	Not all information is applicable to all different lighting products and lighting parts. "if it is dimmable, a list of dimmers it is compatible with" Many dimmable lighting products or lighting parts do not need a dimmer. The lighting product or lighting part might receive a signal that sets the dimming level. This signal might be transmitted over the air (wireless) or over a wired interface, like e.g. DALI interface. For those products that are dimmable by use of dimmer it is not possible to generate a list of compatible dimmers, since lighting supplier has no control on design of these products and as such on its compatibility. This requirement is not feasibly to be managed in a reliable way. The list of dimmers might be too long to display in a readable way.	Remove (i)
LE 34	13	3.3.1 (K)		Change item (k): if it is a luminaire then the instructions for the installation and removal should be added.
LE 35	13	3.3.2 (n)	Not every product is a cylinder	Reword to: The principal outer dimensions in mm
LE 36	13	3.3.2 (o)	A power quality requirement such as PF is not relevant for auxiliary parts	Remove the requirement
LE 37	14	*ANNEX III* **(2) (c)**	Make clear that also the mean of calculated values – as e.g. efficacy- are within the tolerance of 10% and not the individual values.	Add **arithmetical mean** ……the relevant parameters and the **arithmetical mean** values calculated from these measurement(s)……
LE 38	15	Annex IV	A recent[19] round robin experiment between 35 international light technical labs has shown that 5 % difference in results for luminous flux between individual labs is regular, although up to 30% was found in certain cases.	LE propose to add at the end of the introduction paragraph to Annex IV a sentence. Verification procedure must be done with professional equipment in accredited test labs.
LE 39	15	Annex IV	It is identified in Task 7 that effective market surveillance is a key to the effectiveness of a new regulation. Lifetime testing of products places a burden on market surveillance. The draft regulation attempts to solve this by introducing "accelerated endurance testing" in annex IV. Any accelerated testing should reliably simulate the real performance of a product through life. Otherwise there is a danger that introducing a	Delete text after the first paragraph

[19] Yoshi Ohno et al; 4E IC2013, Solid State Lighting Annex: 2013 Interlaboratory Comparison; 10 SEPTEMBER 2014 http://ssl.iea-4e.org/files/otherfiles/0000/0067/IC2013_Final_Report_final_10.09.2014a.pdf

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			requirement to comply with a test that does not have a sound technical basis would encourage development of products purely to pass the test and not to give a better performance to end users. Accelerated testing requires a knowledge of failure modes and judicial use of relevant acceleration factors. The fact that manufacturers of conventional lamps continue to test their products to full lifetime is evidence that the choice of these acceleration factors and assessment of their effects is very difficult. The tests proposed in Annex IV are taken from IEC 62612 (performance of self-ballasted LED lamps). The tests in the standard are designed to test certain features of LED lamps that are not present in other lighting products and lighting product components. In addition, the text of the draft regulation omits the warnings given in IEC 62612 and the acceptance criteria in table 1 are much more severe than in the standard. The tests also require the use of expensive thermal cycling equipment that may be not available for market surveillance authorities. It is clear that there is no "one size fits all" method, and setting reliable accelerated testing criteria would require detailed technical consideration for each type of product. For this reason and for effective market surveillance it is recommended that the requirement for accelerated testing is removed.	
LE 40		Annex V Benchmarks 1.Energy efficiency	200 lm/W is based on a laboratory demonstration rather than a practical market product. A realistic benchmark would be 130 lm/W for the most efficient integrated luminaires, and 93% for control gear.	Change to: The most efficient integrated luminaires have an energy efficiency of 130 lm/W. The most efficient control gear has an energy efficiency of 93%