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Ecodesign Preparatory Study on Light Sources (ENER Lot 8/9/19)
Task 7
"One Lamp Regulation"

	LightingEurope comments
Energy efficiency index vs lumen x watt	The market is rapidly progressing towards energy efficient LED solutions and we expect this trend to continue. As such there is no need to put more stringent legislative measures in place since the market transition is accelerating. Good to note that inefficient light sources like the traditional incandescent, halo phosphate linear fluorescent and high pressure mercury lamps have been banned already, leaving only efficient light sources on the EU market. What is the preference on the energy efficiency calculation method? Further simplification of future regulations is very much welcomed. This will facilitate better surveillance and enforcement. It is a strong preference to continue with the currently regulated Energy Efficiency Index (EEI) "calculation model" compared to one or more individual Lm/W values: • More and more LED solutions come to the market; however they cannot always serve as a fully compatible replacement for the huge variety of conventional lamps for consumers and professional end users. The following replacement issues in existing luminaires will not be solved by the LED technology on short notice: size, form factor, light distribution, light output, weight and heat management. Next to these issues lamps operated on separate ballasts can face problems with electrical compatibility, because many different types of gears (both conventional ballast and electronic control gear) are installed in the European market today. Examples of these issues are reduced performance in dimmed mode and flickering.

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	• Suitable LED replacement lamps will not be available for many conventional lamp types in many applications. Removing conventional lamps from the market would therefore force early refurbishment of lighting systems or even new luminaire investments, which would unnecessarily and dramatically increase the waste stream in Europe. Conclusion: Beyond 2020 not all lamps in all applications can be replaced by LED alternatives. The objective of an accelerated transformation should start - not with banning already energy efficient conventional light sources in order to avoid annoyance with BtoC & BtoB customers. Calculation models in future regulations should therefore accommodate both conventional as well as LED technologies • The regulated Energy Efficiency Index (EEI) "calculation model" best facilitates energy efficiency requirements for both conventional and LED based technologies. The EEI model recognizes the characteristics of the individual lighting technologies where requirements are tuned to the specific applications. • An inherent aspect of the discharge technologies is that their efficiency depends on the lamp wattage. Every discharge lamp needs two electrodes purely for operation, consuming a small amount of energy, without contributing to the light generation (called losses). The lower the lamp wattage, the less efficient; therefore more important this effect becomes in the total energy balance. These so-called losses in the electrode region can be in the order of 2-4 W, hence this effect is especially visible for lamps below 20W. • The EEI model is applied to all technologies and is translated into uniform threshold levels and energy efficiency labels applicable to all lamps. • Applying one single lm/W level (or a mouse trap) will result in lower energy efficiency levels of many products compared to applying efficiency levels determined by the current EEI model:

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	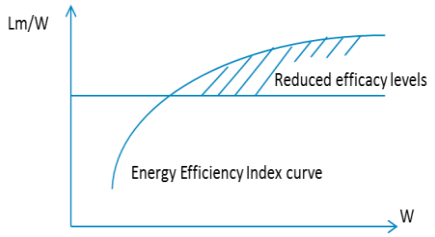
Consequences for different product categories	It is strongly proposed to continue with the regulated Energy Efficiency Index (EEI) "calculation model" compared to one or more individual lm/W. The EEI model best accommodates the individual characteristics of both conventional as well as LED technologies and their product portfolio's. Applying a different calculation model in future regulations will force industry into unnecessary costs. Too high system efficacy targets have severe consequences and would push us at first to a world of only LED + HID + Fluorescent lamps, and then to a pure LED-only world. Too high system efficacies would phase out shorter Fluorescent lamps, e.g. it would rob the lighting industry of many of the popular 600x600mm ceiling modules and force us to use luminaires having the longer lamps. Although these lamps are more efficient - they also consume more total power! Because of this we do not agree to push future efficacy higher than what we have with existing (already energy efficient!) Fluorescent and HID lamps. Much of the possible energy saving that can be achieved has already happened with the existing regulations and we do not see a need to go higher than what present lamps are achieving. Efficacy is not the only measure of performance. Today there are many LED lamps on the market which do not yet fully comply to current regulations (see results MSA activities).
Parameters to be regulated	Energy efficiency becomes less and less important as the power required for lighting is already dramatically reduced. Professional and consumer expectations are more related to early failures, colour variation and similar "obvious" parameters. Focus of market surveillance should be on these parameters.

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	Following parameters are to be included in future regulations as a minimum set of parameters: 1. Energy Efficiency Index (EEI) 2. Color Rendering Index I (CRI) * 3. Color Consistency (SCDM) 4. Lumen maintenance at 2000 hrs (XX%) 5. Initial useful Lumen Output (and equivalency claims) 6. Temporary Light Artefacts * provided that a proper EN standard is in place 7. Power displacement factor (cos phi, instead of power factor) * Sample size: as standards require but from 4 different places * = Lighting Europe position paper available Remarks related to standards: • Limit deviations from International (IEC) standards: Currently much effort is being spent in preparing European common modifications to IEC product standards including a separate annex for each relevant ErP regulation for the product. It should not be forgotten that the change will mean that the European standards will have to be revised again. • Use one set of terms & definitions in all regulations Standardisation will benefit from a single regulation. Currently there are differences in the terms and definitions and requirements between the regulations which can cause confusion. These will be eliminated. • Use terms & definitions already specified in international (IEC) standards In bringing together the regulations, it should be encouraged as much as possible to use the terms and definitions and methods of measurement already specified in international standards. This minimises the changes that have to be made when producing the harmonised European standard and makes the European requirements more understandable to the wider world. • Forward information on regulated parameters as early as possible

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	It should also be encouraged to feed forward information on the parameters deemed important to the European regulators and not included in international standards in a timely way to standardisation bodies so that their use in international standards can be promoted. • Regulate only technology relevant parameters. Avoid waste Consider carefully which parameters are applicable to which products. For example, starting and warm-up time are relevant parameters for discharge lamps, but not for incandescent or LED, and lifetime under short switching cycles for non-domestic lamps with longer run-up times is also not relevant. In making EN standards the irrelevant parameters have had to be added to the common modifications. It then leads to more (costly) testing without adding value. This can be broadened to the requirements for product information.
Market surveillance testing/certification	The European initiative to come to One Single Lighting Regulation is welcomed when it is leading to a better surveyed market, serving private and professional end-users with efficient and good quality lighting at an affordable price. To be reduced to parameters which can be quickly (1-2 days) checked by MSA
OLEDs and other technologies	• OLED will follow LED. • No need for specific regulations related to these technologies Regulations should be technology-neutral.
Professionals vs consumer applications	A clear distinction should be made between professional and consumer applications: In 2016-2020, there will be a mass-adoption of LED lamps in households. Lifetime of LED lamps is currently rated between 15-20Khrs. At a usage of 1000 hrs/year, these lamps will last for 15-20 years. After the peak introduction/conversion period, overall volume/needs on a yearly base will drop drastically. By that time one will see a move towards smarter lamps with added features: Differentiation and drive for new replacement. Improvement in driver and optical efficiency will be limited due to these new features.

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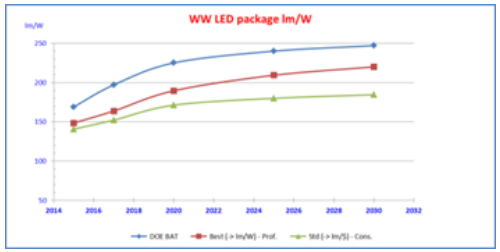
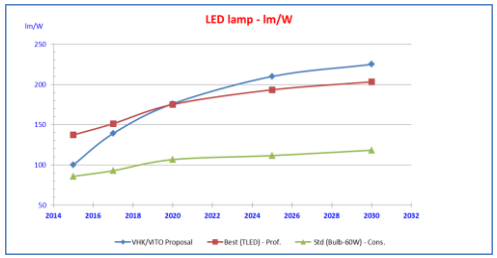
	Consumer less interested in saving an additional 1-2 watts per lamp. Consumers do not make TCO calculations. Affordability remains an important buying criterion. Following lm/w projections should be taken into account:  
How to deal with special purpose products	There are two types of special applications justifying lamps to be exempted from future eco design regulations: **(a) Primary purpose is <u>not</u> a white light lighting (as defined in regulation), such as** (i) emission of light as an agent in chemical or biological processes, such as: polymerisation, ultraviolet light used for curing / drying / hardening, photodynamic therapy, animal care, anti-insect products, water/air/surface purification and disinfection, ozone production (ii) heating (infrared lamps);

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	(iii) colored lamps & blacklight blue or any other light which is used in inspection, examination, measurement and or control processes **(b) Lighting applications, where** (i) the spectral distribution of the light is intended to change the appearance of the scene or object lit, in addition to making it visible (such as food display lighting or coloured lamps as defined in point 1 of Annex I), with the exception of variations in correlated colour temperature; or (ii) the spectral distribution of the light is adjusted to the specific needs of particular technical equipment, in addition to making the scene or object visible for humans (such as studio lighting, show effect lighting, theatre lighting, horticulture); or (iii) the scene or object lit requires special protection from the negative effects of the light source (such as lighting with dedicated filtering for photosensitive patients or photosensitive museum exhibits, clean room illumination, photo-/film development area, printing industry); or (iv) lighting is required only for emergency situations (such as emergency lighting luminaires and lamps or control gears for emergency lighting); or (v) the lighting products have to withstand extreme physical conditions (such as vibrations, high temperatures like oven lamps); or (vi) image capture and image projection (such as camera flashlights, photocopiers, video projectors); or (vii) signaling (such as traffic control or airfield lamps); or (viii) the light is adjusted to the specific needs of a particular optical system (projection lighting, sports lighting, architecture (beautification lighting)); or (ix) Light which is used in or during inspection, examination, measurement and or control processes; or (x) light which is used in *equipment and protective systems intended for use in potentially explosive atmospheres, which require special measures for the light source and the controlgear; or* (xi). Light which is used for health related treatments, such as Photodynamic therapy SAD/Jetlag, Lamps for surgical headlights, operation theatres, (fluorescence-) endoscopy, etc; or (xii). Light which is used for cosmetic purposes, such as tanning, teeth whitening, nail hardening, hair removal; or

	(xiii). Lamps that repel or attracts certain animals (e.g. birds at oil platforms/airfields, insects) or prevent certain behavior (anti-picking for chickens).
Control Gears	**There is a need to have a minimum efficiency value for drivers depending on the power**.

Definitions	**Lamp definition** – only MAINS OPERATED – are low voltage lamps excluded OR was the intent that the "system" (lamp + transformer) should be considered. **Lamp definition** – support the (re)introduction of a minimum lumen value of 60 lumens. **Light emitting surface area definition** – this is not supported, it can be different depending upon the lamp design even for the same "base" product. For example GU10 has many designs with different "chip" / optical emitter sizes.
	Luminaires are not part lamp components *"and they are placed on the market for more than 500 pieces per year (tailor made luminaires for special projects) or with a total Full- Load Power (PON) less than 3W".*
	Definition of directional and non-directional lamps should be clarified.