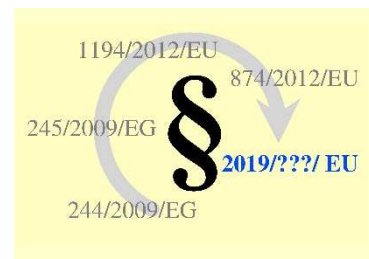


Texte zu den geplanten neuen EU-Regelungen zur umweltgerechten Produktgestaltung und zur Energieverbrauchs-kennzeichnung in der Beleuchtung – Zusammenstellung * des Umweltbundesamtes (UBA), Deutschland



Entwürfe der EU-Kommission vom 13. November 2017
Stellungnahme von LightAware **, Januar 2016

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

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

The EU Commission's drafts of 13 November 2017
Comments by the LightAware **, January 2018

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 LightAware **, Janvier 2018

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

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

** <http://lightaware.org/>

Es folgt ein unveränderter Originaltext.

EN: The following is an unmodified original text.

FR: Ce qui suit est un texte original.

LightAware comments on the proposed changes to the EU Ecodesign Directive 2009

The main objectives of the EU's proposal are to:

Simplify the ecodesign regulations for lighting products by integrating the three existing regulations for:

- non-directional household lamps, covering e.g. CFLs
- lamps mainly used in office and street lighting, eg linear fluorescent lamps (LFLs) and high-intensity discharge lamps (HID)
- directional lamps (spots), including light emitting diodes (LED)

One aim of the changes is expected to reduce the administrative burden for the Commission and for industry and to facilitate market surveillance. The changes also increase the minimum required energy efficiency of light and its effect will be to remove from the market 'some of the remaining less efficient light source types' in effect the new regulations will lead to the phasing out of all light sources other than LEDs.

Exemptions have been made for light sources that are related to health and safety (e.g. explosive atmospheres, emergency lighting, nuclear installations, military installations and equipment, applications in medicine, lights for signalling, and lights in or on means of transport for persons and goods). But, the exemption for individuals with light sensitivity to obtain the lighting they require has been removed.

The legislation behind the ban on incandescent lighting and the mandating of CFL, LED and fluorescent tubes derives from Commission Regulation (EU) No 1194/2012 of 12 December 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for directional lamps, light emitting diode lamps and related equipment.

However, Section 15 of this Directive states that 'The ecodesign requirements should not affect functionality from the user's perspective and should not negatively affect health, safety or the environment'. And 'Product information requirements should allow consumers to make informed choices.' These words make it clear that the mandated CFL and LEDs should not negatively affect (a) health (b) safety (c) the environment. Yet the reality is that they negatively affect all three.

LightAware objects to the proposal to remove the exemption for individuals with light sensitivity in the strongest possible terms. We would like to ask, what contingencies are being made available for those people who cannot tolerate LED lighting? This includes people with autism, lupus, migraine, headache, ME, epilepsy eczema, electrosensitivity and other conditions as well as people who did not have a condition but are made ill by LED.

How are these people going to light their homes and access the life of their community? And how are employers and service providers going to make their premises accessible to light sensitive people? How are individuals' rights under human rights and disability discrimination legislation going to be safeguarded if this proposal goes ahead?

This is LightAware's most important objection to the proposals, however we have several comments on the individual papers supplied.

The explanatory memorandum

The memorandum mentions 'Human Centric Lighting' (use of specific light features for human health and well-being). These developments are open to serious criticism. There is no scientific evidence that this lighting has a positive impact on human health and by seeking to affect human health via lighting they are effectively operating in a pharmaceutical environment rather than a lighting one. Proper clinical trials need to be undertaken to examine the effect of these products on human endocrine and circadian systems. Until then, we believe any company making such claims in their advertising should be referred under the trades descriptions act to prove their claims.

The memorandum also discusses the effect of flicker: "Experts from industry and from standardization organisations have been consulted specifically on so-called 'temporal lighting artefacts' (TLA), including visible and non-visible (but perceivable) flicker. This is an important topic for users, being potentially related to health problems or discomfort." Most LEDs flicker and we believe that this is a cause of headaches in some light sensitive people. ⁱ

Given the entire population of the EU will be exposed to flicker from LEDs in future, we believe that it is essential that the EU commission scientific research as a matter of urgency into the short, medium and long-term effects of flicker on people. The review of the published research conducted by SCHEER identified several gaps in the knowledge of the health risks from LEDs – however it also failed to say that some people are being badly affected now.

The SCHEER report suggested that the EU 'continues to monitor the scientific literature' for evidence of health impacts. Because there is no long-term research in several important areas, we believe that the EU's passive stance is a risk to people's long-term health. Because the EU is driving changes in lighting, surely the onus is for it to commission the required research instead of falling back on the argument that there is not enough research to suggest there is a problem.

Those making policy on lighting urgently need to commission comprehensive research now - and in the interim, the precautionary principle should hold and delay the mass introduction of any new lighting until it can be shown to be safe for everyone. Doing anything else risks a potential health crisis akin to that caused by smoking and asbestos.

ANNEX - EG - EL_20171110

Page 8 (36) The metric for flicker used in this Regulation is 'the 'Pst LM', where 'st' stands for short term and 'LM' for light flickermeter method, as defined in standards. A value Pst LM=1 means that the average observer has a 50% probability of detecting flicker.' We believe this definition is inadequate as flicker not detectable by an observer can still have significant health consequences. We believe that the information on packaging should also contain information on the amount of flicker generated by a product to enable flicker sensitive consumers to make informed choices.ⁱⁱ

Page 8 (39) 'colour temperature' (Tc [K]) means the temperature of a Planckian (black body) radiator whose perceived colour most closely resembles that of a given stimulus at the same brightness and under specified viewing conditions.' We believe simply using colour temperature can mask the huge differences in the spectra generated by different bulbs. For some light sensitive people this might make the difference between a light source being acceptable and one causing discomfort. In addition, the colour temperature specified in several areas, particularly for street lighting and shopping malls is being specified too high for light sensitive people, leading to their exclusion from society. In addition, high colour temperature street lighting has been shown to reduce melatonin levels and cause insomnia in the general population (which can lead to significant long-term health problems). Further research is needed to quantify the risks associated with high colour temperature LEDs and standards set for the allowed in public buildings and open spaces.^{iii iv v}

ACT - EG - EL_20171110

Energy efficiency classes are defined directly in terms of light source efficiency, i.e. 'total light output of a light source (in lumen) divided by the mains (230V) power input (in Watt, W) and expressed as lumen/W.' The report claims that this more straightforward and easier to understand than using the Energy Efficiency Index set out in the current regulation.

However, it is also misleading because in non-uniform light sources, such as LEDs where an intense (and unusable) light in the center of the beam is balanced by much less intense light on the periphery. This measure overstates the energy efficiency of LEDs.^{vi}

ACT - EG - ED review lighting 20171110

Page 3 para 10 - It is estimated that this Regulation will reduce the energy consumption for lighting by 40-60TWh/a in 2030 with respect to a Business-as-Usual scenario. This is not backed up by the latest research that shows that as the cost of lighting (in terms of electricity use) falls, the amount of lighting used is increased (currently by around 2% per year). This is having considerable environmental impacts.^{vii}

Page 4 (15) states 'Exemptions from the requirements set out in this Regulation should be made for light sources with special technical features for use in specific applications, including

those related to health and safety' – In this case why do the proposals remove the exemption for light-sensitive people.

Finally, we believe that the energy reduction regulations for household appliances such as refrigerators and washing machines should not apply to lighting. A fridge is just a fridge, whatever its energy consumption, but lighting is now known to have such significant health impacts that it should be treated in similar ways to new pharmaceutical products, with the requirement for proper research to take place to show that new forms of lighting are safe for all.

About Lightaware

LightAware is a registered charity, SC046160. It was founded to respond to the needs of those whose lives and health have been profoundly affected by the ban on incandescent lighting and the development of new forms of light.

Our Charitable Objectives are:

- To raise awareness about the effects of artificial lighting on human health and wellbeing.
- To stimulate discussion and investigation into the effects of artificial lighting on human health and wellbeing.
- The promotion of equality and diversity through encouraging provision of access to civic life for those excluded by sensitivity to artificial lighting.

ⁱ The Scientific Reason You Don't Like LED Bulbs—and the Simple Way to Fix Them
<https://www.scientificamerican.com/article/the-scientific-reason-you-dont-like-led-bulbs-mdash-and-the-simple-way-to-fix-them/>

LED flickering is even more pronounced than that of fluorescent lighting

ⁱⁱ "Flicker can be perceived during saccades at frequencies in excess of 1 kHz JE Roberts MSc and AJ Wilkins DPhil, Department of Psychology, University of Essex, Colchester, UK. Lighting Res. Technol. 2013; 45: 124-132."

ⁱⁱⁱThe natural 24-hour cycle of light and dark helps maintain precise alignment of circadian biological rhythms, the general activation of the central nervous system and various biological and cellular processes, and entrainment of melatonin release from the pineal gland. Pervasive use of nighttime lighting disrupts these endogenous processes and creates potentially harmful health effects and/or hazardous situations with varying degrees of harm. The latter includes the generation of glare from roadway, property, and other artificial lighting sources that can create unsafe driving conditions, especially for older drivers. More direct health effects of nighttime lighting may be attributable to disruption of the sleep-wake cycle and suppression of melatonin release. Even low intensity nighttime light has the capability of suppressing melatonin release. In various laboratory models of cancer, melatonin serves as a circulating anticancer signal and suppresses tumor growth. Limited epidemiological studies support the hypothesis that nighttime lighting and/or repetitive disruption of circadian rhythms increases cancer risk; most attention in this arena has been devoted to breast cancer. Further information is required to evaluate the relative role of sleep versus the period of darkness in certain diseases or on mediators of certain chronic diseases or conditions including obesity. Due to the nearly ubiquitous exposure to light at inappropriate times relative to endogenous circadian rhythms, a need exists for further multidisciplinary research on occupational and environmental exposure to light-at-night, the risk of

cancer, and effects on various chronic diseases

<http://circadianlight.com/images/pdfs/newscience/American-Medical-Association-2012-Adverse-Health-Effects-of-Light-at-Night.pdf> Please note that this publication has 134 reference on this subject.

^{iv} From https://www.nobelprize.org/nobel_prizes/medicine/laureates/2017/press.html - With exquisite precision, our inner clock adapts our physiology to the dramatically different phases of the day. The clock regulates critical functions such as behaviour, hormone levels, sleep, body temperature and metabolism. Our wellbeing is affected when there is a temporary mismatch between our external environment and this internal biological clock, for example when we travel across several time zones and experience "jet lag". There are also indications that chronic misalignment between our lifestyle and the rhythm dictated by our inner timekeeper is associated with increased risk for various diseases.

^v LED light at domestic lighting levels induced retinal injury in a Sprague-Dawley (albino) rat 19 model after chronic exposure (Shang et al., 2014; Shang et al., 2017).

<https://ehp.niehs.nih.gov/1307294/> Retinal cell function loss was demonstrated in vivo by electrofunctional test showing a significant decrease of b-wave amplitude after 9 and 28 days of blue or white LED, or compact fluorescent lamp (CFL), light exposure. The findings were confirmed ex vivo by a significant thinning of the outer nuclear layer where the nuclei of photoreceptor cells are located and more apoptosis after blue and white LED light exposure, compared with the exposure to the light from the CFL. The retina has one of the highest oxygen consumption levels of tissues in the body and it is sensitive to oxidative stress (Yu and Cringle, 2005). Oxidative stress is the crucial risk factor for photoreceptor degeneration, which is caused by the generation of toxic ROS within retinal tissue. The retina contains enzymes involved in detoxification or synthesis, particularly in the outer segment or retinal pigment epithelium (Shang et al., 2014; Shang et al., 2017). The spectrum emitted by white LED lights contain photons with energies that exceed the threshold of the enzymes serving as a stress-induced protection mechanism (Behar-Cohen et al., 2011); thus, exposure to optical radiation from white LEDs may result in severe damage to the outer retina at high levels of exposure. Spectral power distribution (SPD), as well as irradiance, are risk factors that contribute to the photochemical retinal injury. To prevent or decrease this potential retinal damage, some companies are increasing the market segments of lower colour temperature (i.e. lower blue component) LEDs for domestic lighting (U.S. Department of Energy 2012).

^{vi} Natural light (and artificial light from non-LED sources) is diffuse and uniform in terms of density, whereas the light from LEDs is highly concentrated. See '... unlike traditional sources LEDs are small, directional, and very bright as discrete emitters. Therefore, using an array of them without secondary optics typically produces substantially nonuniform luminous intensity distribution ... M. Nisa Khan, Understanding LED illumination, p91, CRC Press, 2014.

^{vii} The central aim of the "lighting revolution" (the transition to solid-state lighting technology) is decreased energy consumption. This could be undermined by a rebound effect of increased use in response to lowered cost of light. We use the first-ever calibrated satellite radiometer designed for night lights to show that from 2012 to 2016, Earth's artificially lit outdoor area grew by 2.2% per year, with a total radiance growth of 1.8% per year. Continuously lit areas brightened at a rate of 2.2% per year. Large differences in national growth rates were observed, with lighting remaining stable or decreasing in only a few countries. These data are not consistent with global scale energy reductions but rather indicate increased light pollution, with corresponding negative consequences for flora, fauna, and human well-being. <http://advances.sciencemag.org/content/3/11/e1701528>