



# Lighting systems in the EPBD: achieving energy savings, comfort, and wellbeing

## Introduction: combining health and comfort of citizens with achieving energy savings

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On 9 July 2018, [Directive 2018/844/EU](#) amending [Directive 2010/31/EU](#), also called the Energy Performance of Buildings Directive (EPBD) entered into force. LightingEurope welcomes the revisions, as we believe that they will assist in increasing the value of light to society. We would like to build on this progress and further improve the EPBD by including lighting systems into the legislation, as it will increase energy savings and improve the comfort and wellbeing of building users.

In December 2020, the EU agreed to reduce greenhouse gas emissions by 55 % in 2030. As buildings use 40 % of energy and produce 36 % of greenhouse gasses in Europe, an earlier targeted review of the EPBD may be effective in achieving those objectives. Lighting can significantly contribute to the energy savings in buildings, and thus also assist in the reduction of greenhouse gas emissions. Lighting accounts for around 20 % of the total cost-effective energy savings in non-residential buildings: by including lighting systems in the EPBD, an additional 29 TWh/y can be saved by 2030 (up to 56 TWh/y in 2050).<sup>1</sup>

## Setting minimum requirements

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### Managing and controlling the lighting

LightingEurope proposes to optimise and utilise the guidance provided by existing standards (i.e., EN 12464-1), the experience of the Smart Readiness Indicator Development, while taking the latest technological developments into account. Therefore, we propose to include requirements in the EPBD for the optimisation and utilisation of automatic lighting control system.

### Ensuring long-term functioning

In order to ensure the proper functioning of the lighting systems, a periodical assessment will have to be carried out, e.g., by adding lighting inspection to the already existing requirements for inspection of HVAC systems, see Articles 14(1) and 15(1). Important

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<sup>1</sup> VITO et al. (commissioned by the European Commission), *Preparatory study on lighting systems 'ENER Lot 37'* (Brussels, 15 December 2016).

inspection parameters and questions are how the building space is being utilised and whether the lighting system and application are still suitable (whether the light levels are sufficient to provide good quality lighting), and if the controls are still optimised for the space usage. Therefore, LightingEurope proposes to include the following inspection steps to be added to the inspection requirements that are already in place in the EPBD.

### **Inspection instructions for built-in lighting<sup>2</sup>**

1. After installation: is the lighting system properly installed and performing in accordance with the design?
2. Periodically / Through life: are the controls still optimised for the space usage?  
Annual inspection
3. Periodically / Through life: has the use of the space changed or users (or the profile of the users) within the space changed, requiring the lighting design to be confirmed or changed?
4. Periodically / Through life: do the lighting levels and lighting specifications still meet the requirements?

## **Setting terms and definitions**

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### **Built-in lighting**

Article 2(3) confirms built-in lighting as a technical building system. Annex I.1 also states that built-in lighting shall be included in the building's energy performance calculation. This opens the potential for significant energy savings, as lighting accounts for around 20 % of the total cost-effective energy savings potential towards 2030.<sup>3</sup>

However, we think that more clarity is needed on the definition of built-in lighting to achieve that potential. Especially often-used terms, like 'fixed' and 'plugged' luminaires that come with built-in lighting, create confusion.

Different interpretations may hinder the level playing field. In particular, it is important that Member States do not underestimate the potential of a well-designed and advanced lighting system combined with the best lighting product for the different applications.

Therefore, LightingEurope proposes the following:<sup>4</sup>

**“Built-in lighting” means luminaire(s) or equipment to provide illumination according to the lighting system design.**

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<sup>2</sup> LightingEurope prefers the term 'lighting systems' instead of 'built-in lighting' to ensure that the lighting covered will not be shrunk by technological developments and the (increasing) use of portable luminaires in building design; however, the term built-in lighting is used as a technical building system in the EPBD to ensure that only lighting is covered that is part of the fixed fabric of the building in question.

<sup>3</sup> European Commission, *Impact Assessment accompanying the proposal for a Directive on the energy performance of buildings* (Brussels, 30 November 2016).

<sup>4</sup> LightingEurope, *Position Paper on the review of Directive 2010/31/EU on the energy performance of buildings: From energy efficiency to quality of light* (Brussels, 30 March 2017).

## Lighting systems

LightingEurope is pleased to notice that in Annex I, Point 1 the energy performance of a building shall be expressed by a numeric indicator of primary energy use in kWh/(m<sup>2</sup>.y), which is in accordance with the Lighting Energy Numeric Indicator (LENI) as described in EN 15193-1:2017. The optimal usage of this calculation method is directed at lighting systems, which are described in EN 12665.<sup>5</sup>

As such, LightingEurope would like to highlight that lighting systems are defined as:

**“Lighting system” is a system designed to provide lighting.<sup>6</sup>**

*Note 1 to entry: A lighting system can be dedicated to*

- a. the support of one or more specified visual tasks under specified conditions considering other requirements such as human comfort, safety, the appearance of the surrounding environment and energy consumption;*
- b. the support of other than human tasks.*

*Note 2 to entry: A lighting system can include a set of light sources, other physical components, communication protocols, user interfaces, software, and networks to provide control and monitoring functions.*

*Note 3 to entry: The light source(s) and the related equipment can be integrated in a single item, e.g., an LED module, a lamp, or a luminaire.*

*Note 4 to entry: A lighting system can be networked to provide central or remote control and monitoring functions.*

*Note 5 to entry: A lighting system can be connected to or integrated with other systems or devices.*

(International Lighting Vocabulary (ILV) of the IEC)

Additionally, lighting systems are defined in EN 12665 as ‘lighting equipment or lighting solution (lamps, ballast, luminaire and controls) required for the lighting scheme, its installation and operation during the life of the scheme.’ However, the ILV definition is planned to be adopted by this standard in the (near) future.

## Lighting system design

Built-in lighting bases its potential on lighting systems and the way in which they are designed. As such, LightingEurope has mandated CEN/TC 169 on light and lighting to develop a Lighting Systems Design Process.

**Lighting system designs are taken to be a product consisting of a set of documentation approved by the lighting system designer detailing the information used and the solution proposed for the project.**

(CEN/TS 17165)

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<sup>5</sup> VITO et al. (commissioned by the European Commission), *Preparatory study on lighting systems ‘ENER Lot 37’* (Brussels, 15 December 2016).

<sup>6</sup> Please note that the IEC also has a definition for ‘systems’ (IEV 192-01-03).

Currently, lighting system design is usually based on minimum quality parameters in application standards, such as described in EN 12464 (lighting at workplaces), EN 12193 (lighting for sports), or EN 13201 (road lighting).

## Contact

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LightingEurope is the voice of the lighting industry, based in Brussels and representing 30 companies and national associations. Together these members account for over 1,000 European companies, a majority of which are small or medium-sized. They represent a total European workforce of over 100,000 people and an annual turnover exceeding 20 billion euro. LightingEurope is committed to promoting efficient lighting that benefits human comfort, safety and wellbeing, and the environment. LightingEurope advocates a positive business and regulatory environment to foster fair competition and growth for the European lighting industry. More information is available at [www.lightingeurope.org](http://www.lightingeurope.org).