

# Position Paper on lighting systems

## Introduction

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Since its establishment, LightingEurope has always supported initiatives from the EU that benefit consumers, the environment, and the economy. LightingEurope therefore promotes lighting systems, as they create significant energy savings, while at the same time increasing comfort and performance levels of building users.

LightingEurope urges the European Commission to:

- Maintain a regulatory environment in which lighting systems can operate both independently and as part of a Building Automation and Control System (BACS);
- Consider and proceed with implementing the policy proposals from the ENER Lot 37 Preliminary study on lighting systems;
- Align the recently initiated ENER Lot 38 study on requirements for BACS with the policy proposals from the ENER Lot 37 study wherever possible and include the policy proposals from the ENER Lot 37 study in ENER Lot 38, while driving adoption of the recommendations outlined by the Smart Readiness Indicator;
- Include requirements on functionalities that are technology neutral, and do not impose a burden on the industry by creating requirements on (control) devices;
- Ensure operation with BACS while keeping flexibility for the needs of lighting;
- Achieve compliance with the overarching CEN/TS 17165 about specifications on the Lighting System Design Process, in order to fulfil the needs of both building users and investors; and
- Focus on energy savings by the use of (lighting) control systems, independent from the building's demand-side energy load.

## Energy savings through lighting systems

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Depending upon the scenario, lighting accounts for around 20 % of the total cost-effective energy savings potential in non-residential buildings towards 2030.<sup>1</sup> Properly designed and well-coordinated lighting systems are one of the most cost-efficient ways to reduce energy consumption and CO<sub>2</sub>-emissions.

The ENER Lot 37 Preliminary study on lighting systems proposes policy measures for lighting systems, which can be assessed by applying EN 15193-1 (LENI measured in [kWh/(y/m<sup>2</sup>)]). An estimation of the energy savings potential of lighting systems is demonstrated in Figure 1.

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<sup>1</sup> European Commission, *Impact Assessment accompanying the proposal for a Directive on the energy performance of buildings* (Brussels, 30 November 2016), p. 54-55.

|  | 2030                         | 2050                           |
|--|------------------------------|--------------------------------|
| <b>Annual energy savings</b>                   | 20 – 29 TWh/y                | 48 – 56 TWh/y                  |
| <b>Lighting electricity consumption (EU28)</b> | 9 %                          | 18 %                           |
| <b>Cumulative energy savings</b>               | 110 – 180 TWh                | 900 – 1,000 TWh                |
| <b>Cumulative GHG reduction</b>                | 40 – 60 MtCO <sub>2</sub> eq | 270 – 300 MtCO <sub>2</sub> eq |
| <b>Energy expenditure reduction</b>            | € 3 – 5 B/y                  | € 21 – 25 B/y                  |

**Figure 1:** Energy savings for optimised lighting systems with controls<sup>2</sup>

LightingEurope encourages the European Commission to act on the policy recommendations set out in the final ENER Lot 37 study and to work towards achieving energy savings via lighting systems by mandating functionalities, such as presence and daylight lighting control in addition to existing legislation for lighting components.

In addition to large energy savings, lighting systems offer significant benefits to the building users as regards their visual comfort, wellbeing, and performance. The primary purpose of lighting is to illuminate and to provide the correct conditions for the user. Indoor lighting requirements that ensure a minimum of visual comfort and performance are elaborated in EN 12464-1. It mainly focusses on workplaces and goes hand in hand with EN 15193-1:2017 on the energy requirements for buildings. The aforementioned aspects are referred to in the overarching CEN/TS 17165 specification on the Lighting System Design Process, which fulfils the needs of both building users and investors.

Lighting systems are part of the management of a building. This is facilitated by the operation of lighting systems within BACS without restrictions, so that light scene results can be realised according to the visual and non-visual needs of the end-user. This requires measures that focus only on the functionality of BACS and are technology neutral. ENER Lot 37 study shows how large energy savings can be obtained, provided that technologies are not fixed (i.e. technology neutral requirements). Introducing requirements on (lighting) control devices (i.e. not technology neutral requirements) will limit the development of further energy savings technologies. Therefore, the technology neutral approach is a prerequisite to obtain smart buildings, as envisaged by the Smart Readiness Indicator.

### **Risks of demand-side flexibility**

While lighting has properties that are interesting for participation in future demand-side flexibility (considerable load, fast response, and no delayed consumption), it should be noted that there are legal requirements for the provision of light, e.g. at work, streets, underground tunnels, etc., which complicate the connection to demand-side flexibility. Therefore, the focus should be on the energy savings by the use of controls in lighting systems, and the renovation of old lighting installations by using controls is the recommended way forward. More information can be found in the LightingEurope [Position Paper on lighting in the smart grid](#) (dated 13 November 2014).<sup>3</sup>

<sup>2</sup> *Ibid.*, p. 331.

<sup>3</sup> LightingEurope, *Position Paper on lighting in the smart grid* (Brussels, 13 November 2014). < [www.lightingeurope.org/images/publications/position-papers/Lighting\\_in\\_the\\_Smart\\_Grid.pdf](http://www.lightingeurope.org/images/publications/position-papers/Lighting_in_the_Smart_Grid.pdf) >.

# Healthy Buildings by Human Centric Lighting supported by BACS

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The real potential of lighting systems lies in how they can improve the quality of lighting and the wellbeing and performance of the occupants of a building by enabling Human Centric Lighting (HCL) (see Figure 2). In short, this means that the right light is realised at the right place and at the right time. HCL is based on dynamic changes of light spectrum and light intensity during the day, balancing both daylight and electric light.



Figure 2: Benefits for people due to higher wellbeing and performance<sup>4</sup>

The CIE 222 Report forms the basis of lighting strategies that enable HCL. LightingEurope has identified the features of lighting system that contribute to the uptake of HCL (information in development).

LightingEurope urges the European Commission to set minimum requirements for functionality of lighting systems in buildings and no requirements for the technology (incl. systems components), since it is expected that lighting systems/BACS technology will see major innovations in the coming years.

More information can be found in the LightingEurope [infographic on Healthy Buildings](#) (dated 4 October 2017).<sup>5</sup>

## Contact

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LightingEurope is the industry association that represents the lighting industry in Europe. We are the voice of more than 1,000 lighting companies that employ more than 100,000 Europeans and create an annual European turnover of over € 20 billion. Our daily mission is to advocate and defend the lighting industry in Brussels, while reconciling it with ongoing EU policy aims. In doing so, we are dedicated to promoting efficient lighting practices for the benefit of the global environment, human comfort, and the health and safety of consumers. More information is available on: [www.lightingeurope.org](http://www.lightingeurope.org).

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<sup>4</sup> Source: EcoDesign Consultants, *Healthy Buildings* (February 2016). See: < [www.ecodesignconsultants.co.uk/healthy-buildings/](http://www.ecodesignconsultants.co.uk/healthy-buildings/) >; University of Twente and CBRE, *Healthy Offices Research* (2016). See: < [www.cbre.nl/en/healthy-offices-research](http://www.cbre.nl/en/healthy-offices-research) >.

<sup>5</sup> LightingEurope, *Infographic on Healthy Buildings* (4 October 2017). < [www.lightingeurope.org/images/focus-areas/LED/11\\_LE\\_HealthyBuilding\\_Infog.pdf](http://www.lightingeurope.org/images/focus-areas/LED/11_LE_HealthyBuilding_Infog.pdf) >.