



**LIGHTINGEUROPE**  
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## **HUMAN CENTRIC LIGHTING**

### **A basic overview**

September 2014

For a long time we have known that light allows us to see, aiding orientation and enhancing safety. But light can do more than enabling vision. Light has the power to energize, relax, increase alertness, cognitive performance and mood, and to improve the day-night-rhythm of people. These biological and emotional benefits of light should not be underestimated. Recent research has shown these benefits in nearly every area of application.

Despite current trends in legislation and practice, light is concerned with much more than energy efficiency. The true value lies in the combination of excellent visual, biological and emotional benefits. Within LightingEurope we call lighting combining all three benefits “Human Centric Lighting”. And it is now possible to include biological and emotional benefits into modern lighting solutions.

At the beginning of this millennium, a third photo receptor in the eye (in addition to rods and cones) was discovered. With this discovery, it became evident that human biological rhythms and cognitive performance are influenced by specific light conditions. In other words, lighting has tremendous effects on human health, productivity, and well-being.

Initial potential benefits of human centric lighting include improved sleep/wake cycles, daily changes in alertness, performance and mood (circadian changes), as well as responses to seasonal changes. Benefits can be achieved with new technology that allows for greater adaptation of light’s colour temperature, illuminance levels, and distribution so it more closely resembles natural conditions. Applications where benefits may be achieved include healthcare, education, workplace, smart cities and domestic lighting.

The ability of light to achieve these various non-visual effects depends on the spectrum, intensity, and temporal pattern of the light, as well as the light-exposure history and preceding sleep patterns of the individual. Therefore, the optimization of a Human Centric Lighting solution for a given non-visual effect is only possible when this user context is accounted for. This requires a dedicated and tailor-made design, based on a profound understanding of the personal and environmental conditions of the use-case(s). A “one size fits all” Human Centric Lighting solution does not exist, and one may even do more harm than good when applying a solution beyond the context and scope it was designed for.

The consequences for these new findings are profound. As recognized by the European Commission with the awarding of the SSL-erate project and the United States Department of Energy in a recent solid state lighting fact sheet, “the non-visual needs should also be considered”. This simple statement shows that it is no longer enough to see and be seen. It is now crucial to get the right light at the right time.