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LIGHTING

SPECIAL REPORT | 11 - 12 OCT. 2017
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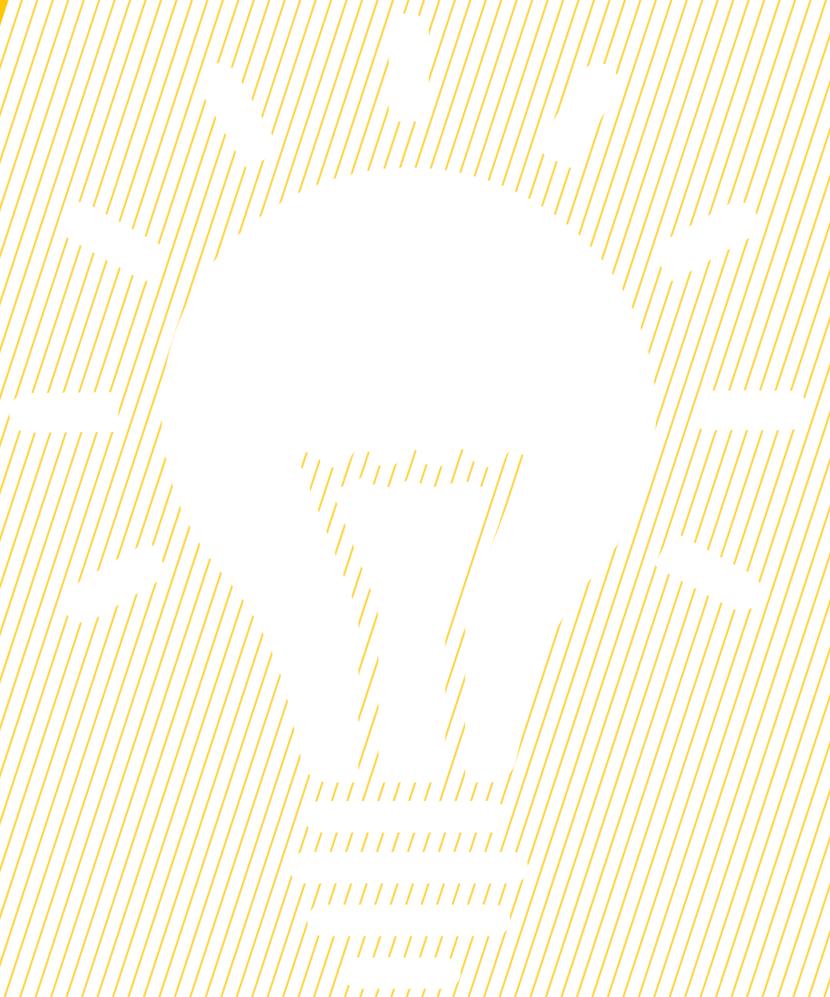
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OPINION

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Lighting for well-being



[Shutterstock]

Until recently the lighting industry has focused on creating a lighting environment that facilitates the visual task, is integrated with the building architecture and fulfils requirements on sustainability and energy efficiency. However, recent research demonstrates the impact that the quantity and quality of light can have on human health and well-being.

One key impact is the disturbance of the biological clock and therefore of sleep patterns due to disruption to the Circadian rhythm. Indeed, for thousands of years, human beings

spent their life mostly outside.

Exposure to the natural cycle of light in the past has forged a natural clock in us like all other creatures. To put it simply, bright intense daylight in the morning signals our bodies that it is time to start the day and conversely yellower, dimmer light in the evening tells us we are due for rest.

Most people have a biological clock either longer or shorter than 24 hours, which is tuned to the light of the sun's daily cycle that daily corrects it to 24 hours. We call this the Circadian rhythm. In our modern lives, we spend more than 90 % of our time indoors, under electric light. In doing so we can

severely disrupt this natural biological clock.

Lighting manufacturers and designers join forces to provide lighting quality, which takes into account variables such as colour rendering, vertical and horizontal illuminance, uniformity, glare and colour temperature, and generally to create comfortable and enjoyable lit spaces. It is clear that lighting needs to combine excellent visual, biological and emotional effects for human beings.

While electrical light in the

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past lacked the ability to mirror the intensity, timing, color and dynamics of natural light such as we know it, today the right lighting technology and design can take into account all the visual and non-visual effects of light to improve health, well-being and performance of human beings in the built environment.

“Human Centric Lighting” (or HCL) refers to lighting that brings such

benefits to the users. For example, tuneable and dynamic LED luminaires, intelligent lighting systems together with dedicated lighting design can simulate the appearance and effects of natural light in a designed space. By including natural light, establishing light contrasts and changes in colours and intensities over time we can create, in humans, some of the circadian effects of natural light.

Light can improve cognitive performance and mood, it can

energize, increase alertness or ease relaxation. Practically, this means that lighting can be designed to support specific user needs, thanks to a combination of technology including sensors and controls that result in the right light at the right time and at the right place. Working and living in a healthy environment is an important aspect of our daily lives. Ensuring that buildings become healthier and more energy friendly should thus rightly be a key concern for the EU.



INTERVIEW

Peter Liese MEP: 'Intelligent lighting has biggest saving potential'



"Lighting systems are definitely a part of the common market and I don't think it would be good if member states have different legislations.," says Peter Liese. [© European Union 2017 - Source : EP.]

The EU's ban on incandescent light bulbs was the low-hanging fruit for energy savings in lighting, believes German MEP Peter Liese. Much more can be achieved now with modern lighting technology, he told EURACTIV in an interview.

Peter Liese is a German MEP from the ruling Christian Democratic Party (CDU), affiliated to the centre-right European People's Party (EPPP). On 11 October, he is hosting a conference on "Lighting and Well-Being in Buildings" in the European Parliament.

In 2008, the EU decided to ban incandescent light bulbs as a way to promote more efficient lighting and cut carbon dioxide emissions. Almost ten years on, what is your assessment of this measure? Has it been successful in your view?

The Communication of the European Commission was not perfect and maybe the incandescent light bulb ban should have been not the first measure under the Ecodesign Directive, but all in all, I think it has been very successful. The decision

allows us to save as much energy as four nuclear power plants can produce.

What can EU regulators now do to further cut energy consumption and emissions from lighting? Have we reached the limits?

We definitely didn't reach the limit. Modern LED technology and even more innovative lighting systems can save much more energy.

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In which areas is the savings potential highest?

I think the biggest saving potential is in intelligent lighting. But also other areas need to be addressed. That doesn't mean that everything has to be done by command and control. I think the existing legal framework already pushed innovation a lot.

How can the revised Energy Performance of Buildings Directive (EPBD) make a difference with regards to lighting? What are the most important aspects that Parliament will have to vote on?

The Parliament's report underlines the importance of "healthy indoor climate conditions", which also refers to natural and artificial lighting and that national long-term renovation strategies should integrate considerations for improvements to health and indoor climate.

A recent study for the European Commission argues that lighting also has an impact on the wellbeing of people. That sounds a bit far-fetched. Are those benefits sufficiently well documented?

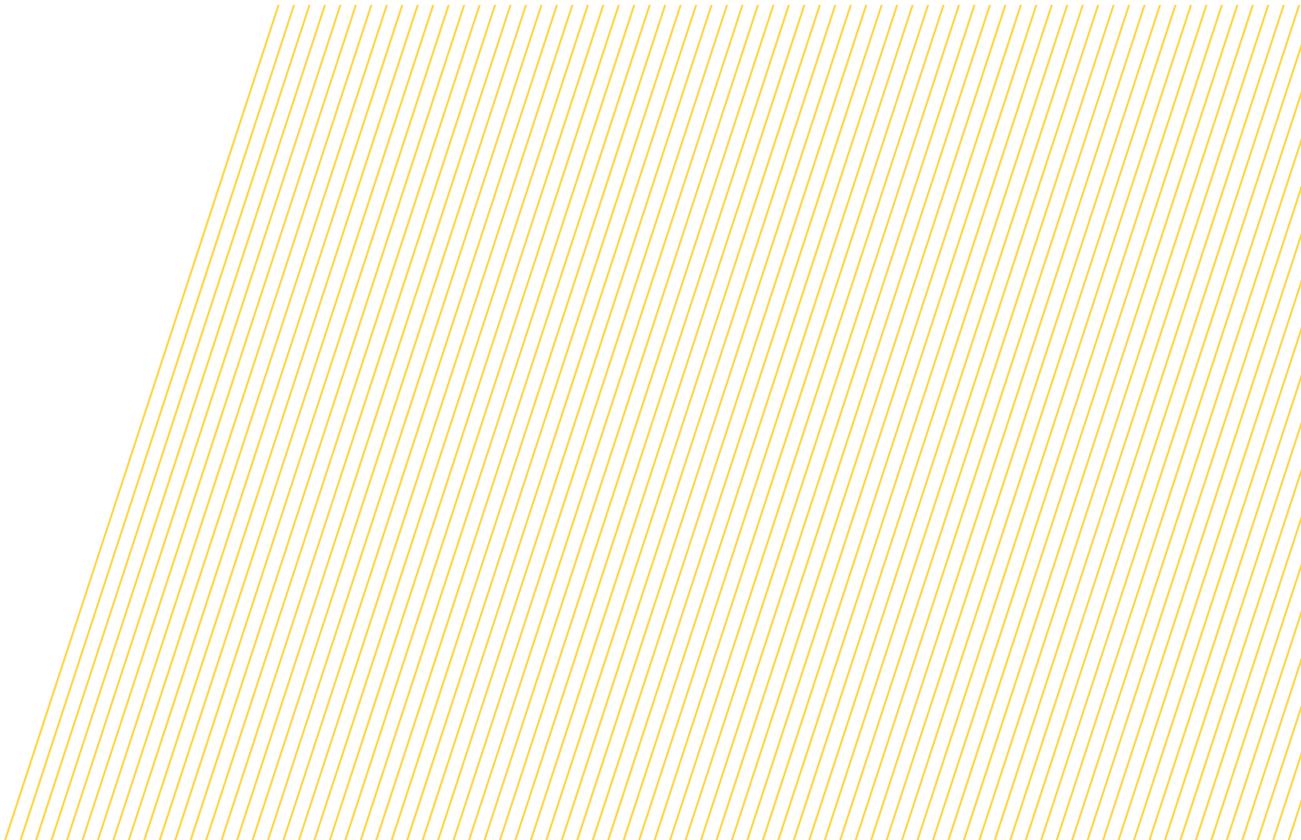
The effect of lighting on the wellbeing of people is in my view well proven and we should encourage companies and private building owners to make use of it.

Human Centric Lighting has emerged as a new concept to enhance not just vision but also wellbeing of people - whether at work or at home. This sounds like a good architectural concept for Feng Shui enthusiasts but surely this has nothing to do with policy. Or could this inspire policymakers too?

I think human centric lighting has a very good scientific base. On the other hand, we need to carefully consider if we go for legislation in this area. Information and encouragement are the better options currently in my view.

Is lighting and wellbeing something the European Commission should pick up, maybe as part of Occupational Health and Safety policies? Or should this be left to the member states along the subsidiarity principle?

Lighting systems are definitely a part of the common market and I don't think it would be good if member states have different legislation. But the question is if we need legislation at the current stage. In my view, the answer is no. We need to work with information and incentives. But if we need legislation, it should be European.



Policymakers set eyes on next wave of EU lighting laws

By Frédéric Simon



Industry representatives are keen to stress the importance of lighting for the well-being of people in buildings – whether in the workplace, schools, hospitals, or elderly homes. [Thomas Hawk / Flickr]

Almost ten years after the European Union banned incandescent light bulbs, policymakers are turning their attention to less immediate aspects of lighting – ranging from productivity gains in the workplace and classrooms to human well-being and even emotional health.

When the EU decided to impose the ban in 2008, reactions in the industry ranged from pure anger to sheer panic among ill-informed consumers.

With hindsight, no-one is

questioning the benefits of the ban anymore.

“I think it has been very successful,” says Peter Liese, a German Christian Democrat MEP who hosted an event on “Lighting and Well-Being in Buildings” in the European Parliament on Wednesday (11 October).

“The decision allows us to save as much energy as four nuclear power plants can produce,” Liese told EURACTIV in an interview, adding that “modern lighting is doing a lot to achieve our climate targets”.

“And now, we are looking at

whether further eco-design measures are necessary to achieve deeper cuts,” Liese told participants at the event, organised with the support of trade groups LightingEurope and the International Association of Lighting Designers (IALD).

But for now, the European Commission is still undecided. Further eco-design rules related to lighting systems were explored in detail in a preparatory study carried out for the Commission’s energy directorate (DG

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Energy).

“We still haven’t made up our minds about what to do with Lot 37 of eco-design, which is related to lighting systems,” said an official from DG Energy who responded to questions at the Parliament event.

“In particular, we are missing information on the macroeconomic impact, which is quite relevant. So we are thinking about which message to bring at the consultation forum that will take place in December,” the official said.

Other speakers at the event were more bullish about the potential to further reduce energy consumption from lighting systems. The limits of eco-design improvements have “definitely” not been reached, said Pieter Liese, the German MEP. “Modern LED technology and even more innovative lighting systems can save much more energy,” he explained.

The ban on incandescent light bulbs was “the low hanging fruit”, added Kevan Shaw from IALD, who pointed to additional savings potential from the electrical circuits lying behind the light bulb.

“The biggest saving potential is in intelligent lighting,” Liese told EURACTIV.

NOBEL PRIZE REVEALS EFFECTS OF LIGHT ON ‘BIOLOGICAL CLOCK’

But while energy savings are the most immediately apparent feature of lighting, other aspects are making their way into the thinking of policymakers.

The Energy Performance of Buildings Directive (EPBD), which was voted on in the Parliament’s industry committee (ITRE) the same day, for the first time underlined the importance of maintaining “healthy indoor climate conditions”, which also refers to natural and artificial lighting, Liese said.

Industry representatives are now keen to stress the importance of lighting for the well-being of people in buildings – whether in the workplace, schools, hospitals, or elderly homes.

“Saving energy has been and will remain a key objective for EU policymakers and industry stakeholders, but addressing lighting quality and well-being should be granted a similar importance,” LightingEurope and IALD said in a joint statement.

The physiologically complex but wide-ranging effects of light on the human body were uncovered on 2 October by scientists who won the Nobel Prize in medicine for isolating a gene that controls the normal daily biological rhythm in fruit flies.

“We now recognise that biological clocks function by the same principles in cells of other multicellular organisms, including humans,” the Nobel Assembly said on its website announcing this year’s laureates.

The ground-breaking research uncovered how “our inner clock adapts our physiology to the dramatically different phases of the day” and “regulates critical functions such as behaviour, hormone levels, sleep, body temperature and metabolism,” the Nobel Assembly added.

The Nobel Prize award came as a perfect shoe-in for industry representatives, who were quick to highlight the breakthrough discovery to stress the importance of artificial lighting for human well-being.

“This perfectly fits our message – biological rhythm is the basis for all body functions. And that has to be supported by light,” said Dieter Lang from German company LEDVANCE, who spoke on behalf of LightingEurope at the Parliament event.

“Today there is a discrepancy between natural and electric light with regard to intensity, colour and dynamics of light,” Lang told participants. “And this is getting worse,” he pointed out, citing EU

figures according to which Europeans now spend 90% of their time indoors.

“So there is definitely a risk that this biological requirement is not given by artificial lighting,” Lang warned.

HUMAN CENTRIC LIGHTING?

The health risks linked to inappropriate lighting were underlined by the Nobel Assembly, which pointed to “indications that chronic misalignment between our lifestyle and the rhythm dictated by our inner timekeeper is associated with increased risk for various diseases.”

These include disorders related to sleep patterns, feeding behaviour, hormone release, blood pressure, and body temperature.

Based on these medical findings, industry representatives have now come up with the concept of Human Centric Lighting, which takes into account variables such as colour rendering, vertical and horizontal illuminance, uniformity, glare and colour temperature to improve the lighting conditions in places like schools, hospitals, homes, offices and factories.

Examples include tuneable LED luminaires and intelligent lighting systems which, together with dedicated lighting design, can simulate the appearance and effects of natural light in a building.

“Today the right lighting technology and design can take into account all the visual and non-visual effects of light to improve health, well-being and performance of human beings in the built environment”, LightingEurope claims.

The potential benefits to wider society are considerable, according to figures cited by the industry. “Healthy buildings” can boost productivity by up to 12% for office employees,

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and up to 18% for workers. Well-designed buildings can also improve student's scores at school by 14%, and boost sales in retail stores by as much as 25%, according to Eco Design Consultants, an award-winning chartered architectural practice based in the UK.

The business gains of human centric lighting systems could also be handsome, according to industry figures, with Lang estimating the market in Europe at €1.4bn per year in 2020, under a "realistic scenario" assuming selective government support, joint industry initiatives and "considerable marketing investments".

COMMISSION CAUTIOUS

But policymakers prefer keeping a hands-off approach, for the time being.

Paula Rey Garcia, an official at the Commission's DG Energy who spoke at the Parliament event, underlined how lighting performance, comfort and wellbeing were now incorporated into the revised Energy Performance of Buildings Directive (EPBD).

"We are taking small steps in that direction," Garcia said in response to a question from a Philips Lighting lobbyist who asked whether the EPBD could be renamed to better reflect well-being aspects.

Garcia stressed that the EPBD provided only a "minimum framework" and that member states were allowed "quite a lot of flexibility" on how to implement it. "We can't go into much detail," Garcia admitted, saying only that the Commission "may come up with a position" on lighting systems in December this year.

Antonio Cammarota, an official at DG Employment, was equally cautious, saying the existing two EU directives on health and safety at the workplace were generally still fit for

purpose. A recent communication on "safe and healthier work for all" could provide an opportunity to update the annexes of the two directives, which date back to 1989 and 1990, he said.

But the main objective will be to clarify some legal requirements related for example to "adequate lighting" at the workplace, he pointed out, saying there was "an implementation problem" with those provisions which are largely ignored by employers.

To its credit, the Commission may have reason to tread carefully. When the EU executive adopted the ban on incandescent light bulbs in 2009, it initially won plaudits for taking a bold move to protect the environment.

But the applause soon turned into boos and jeers. Consumer groups in Europe and the US vociferously campaigned against the new bulbs, arguing an inferior light quality and mercury components in fluorescent lamps, with potentially toxic effects on health and the environment.

"The Communication of the European Commission was not perfect," admitted Peter Liese, the German MEP. "And maybe the incandescent light bulb ban should not have been the first measure under the Ecodesign Directive," he told EURACTIV.

"But all in all, I think it has been very successful".



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