



LIGHTINGEUROPE
THE VOICE OF THE LIGHTING INDUSTRY

How lighting contributes to the UN Sustainable Development Goals (SDGs)

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Introduction

The Sustainable Development Goals (SDGs), also known as Global Goals, are a set of 17 integrated and interrelated goals to end poverty, protect the planet, and create a more sustainable future for all.

This paper focuses on the SDGs where LightingEurope believes lighting makes a major contribution to achieving the targets set out by the UN.



So often we simply take light for granted. Light helps us to see and navigate our surroundings and allows us to continue to function indoors or in the dark. Yet lighting can do so much more - it impacts our mood, makes us feel safe, and is used to disinfect water, surfaces and the air we breathe.

Ourania Georgoutsakou, Secretary General,
LightingEurope











With these pages, we in LightingEurope want to showcase how lighting can concretely contribute to the SDGs – from the well-established energy savings that modern lighting technologies offer, to the less widely known benefits of the non-visual aspects of lighting. From ensuring healthy lives and well-being for all to granting better access to essential services such as equitable education, potable water, and affordable energy. We have gathered facts and figures from studies spanning various disciplines and sectors.

About LightingEurope

LightingEurope is the voice of the lighting industry, based in Brussels and representing 30 companies and national associations. Together these members account for over 1,100 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.

Priority SDGs

There are 17 SDGs and 169 targets in total. This section identifies the specific SDGs and targets that LightingEurope believes the lighting industry can make a direct contribution to.

 <p>3 GOOD HEALTH AND WELL-BEING</p>	Ensure healthy lives and promote well-being for all at all ages
 <p>6 CLEAN WATER AND SANITATION</p>	Ensure availability and sustainable management of water and sanitation for all
 <p>4 QUALITY EDUCATION</p>	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
 <p>7 AFFORDABLE AND CLEAN ENERGY</p>	Ensure access to affordable, reliable, sustainable and modern energy for all
 <p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>	Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation
 <p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	Make cities and human settlements inclusive, safe, resilient and sustainable
 <p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	Ensure sustainable consumption and production patterns
 <p>13 CLIMATE ACTION</p>	Take urgent action to combat climate change and its impacts
 <p>15 LIFE ON LAND</p>	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
 <p>17 PARTNERSHIPS FOR THE GOALS</p>	Strengthen the means of implementation and revitalize the global partnership for sustainable development

SDG-3 | Ensure healthy lives and promote well-being for all at all ages

Human Centric Lighting

Light and darkness have a direct impact on our circadian system i.e. our biological clock. As a result, the quantity, spatial distribution, spectral properties and cycles of light all affect our health and wellbeing. Everything from our mood to our ability to work, relax, be creative and socialize, all depend on the provision of quality lighting.

Europe's lighting industry has the technology and tools to deliver Human Centric Lighting, i.e. lighting that supports the health, well-being and performance of humans by combining the visual, biological and emotional benefits of light. Modern lighting technologies offer affordable and simple methods to implement human-centric lighting. Our need for lighting also varies over our lifetime. Did you know that a 70-year-old needs twice as much light as a 30-year-old? That is because biologically our visual capacity reduces dramatically with age so the older we get, the more light we require.

Read more:

[How to create Better Lighting – Recommendations to EU policymakers](#), LightingEurope, April 2021
[Human Centric Lighting Infographic](#), LightingEurope, 2017

SDG-4 | Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all



Light impacts more than just our ability to see – it also affects our alertness, cognitive performance, emotions and sleep/wake cycle. This is why we need bright white light that mimics sunlight to be active during the day and darkness to get a good night's sleep.

The right light supports students in their learning: concentration is increased, and studying together is easier and more fun. The beginning of classes, during both summer and winter, can be supported by bright light, which also helps in preventing young students from developing myopia.

Research indicates that compared to adults, a teenage girl's internal clock is delayed by one hour, and a boy's is delayed by up to two. That is why during winter students need extra amounts of blue light early in the morning at school to fully wake them up and better synchronize their rhythms with their daily activities.

Inclusive and equitable quality education is best accomplished with in-classroom teaching. UV-C products reduce the risk of becoming infected with airborne diseases and of missing class.



SDG-6 | Ensure availability and sustainable management of water and sanitation for all

Innovative lighting technologies can help keep people healthy and safe. UV-C is an established technology used to disinfect water, air and surfaces. It has been applied extensively since 1910 when it was found to be an effective tool in preventing the spread of disease.

The technology has been proven to inactivate, without exception, all bacteria and viruses against which it has been tested, including among others those causing tuberculosis, influenza, the common cold and SARS.



SDG-7 | Ensure access to affordable, reliable, sustainable and modern energy for all

- LED lighting technology requires less energy to deliver the same amount of light than conventional lighting: an incandescent bulb was powered by 60W, and its LED retrofit equivalent can today be powered by 6W. This low power requirement means that LED lighting can be powered off-grid also, for example with affordable, locally generated solar power.
- A transition to LED lighting systems that combine controls and sensors will lead to a further immediate, significant and measurable reduction in energy use and its associated cost.



- In the EU the EU-28 total achievable annual electricity savings for optimized LED lighting system designs with controls (depending on the reference light source scenario) are:
 - **20-29 TWh/year in 2030**
 - **48-56 TWh/year in 2050**
- Properly designed and well-coordinated lighting systems are one of the most cost-efficient ways to reduce energy consumption and CO2 emissions (1).

1. [Impact Assessment accompanying the proposal for a Directive on the energy performance of buildings](#), European Commission, Brussels 30 November 2016, p. 54-55.

SDG- 9 | Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation



Innovations in lighting give people across the world access to affordable, quality lighting that can do more than just illuminate. By way of example:

- On average, the introduction of LED technology has multiplied the lifetime of lighting products by 10 and cut energy use by 10.
- Lifi technology allows the safe transmission of data with light.

Lighting has been the subject of two Nobel prizes in recent years:

- 2014 Nobel Prize in Physics was awarded jointly to Isamu Akasaki, Hiroshi Amano and Shuji Nakamura "for the invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light source";
- 2017 Nobel Prize in Medicine was awarded jointly to Jeffrey C. Hall, Michael Rosbash and Michael W. Young for their study on how light impacts our circadian rhythm.

LED technology has been commercialized and rolled out across the world in around 10 years, enabling significant energy savings that are critical to resilient infrastructure. The European Commission estimates that switching to energy-efficient lighting will allow Europe to save up to 34 TWh of electricity per year by 2030, and will prevent around 7 million tonnes of CO₂ equivalent from being emitted every year (2).

2. [Simpler EU energy labels for lighting products applicable from 1 September](#), European Commission, 31 August 2021

SDG-11 | Make cities and human settlements inclusive, safe, resilient and sustainable

- LED-based lighting systems with controls and sensors, both indoors and outdoors, allow cities to reduce their energy use and offer the right light when and where it is needed.
- Good lighting design not only helps people navigate their environment. Good lighting design keeps people safe. Well-lit pedestrian crossings or cyclist paths can reduce accidents when it's dark. Well-lit areas help people feel safe and can prevent violence and crime.
- Landmark lighting and city beautification through lighting will also help us feel proud of our surrounding areas, which strengthens our belonging to the area and its identity.
- A recent survey, conducted by the research company Ipsos on behalf of Lighting Sweden, shows that lighting is considered the single most important measure to increase people's sense of security outdoors, even more important than having more police officers and guards (3), (4).
- The right night-time lighting can make shift workers feel safe on after-dark commutes. It can make people more likely to walk or take public transport and, it can encourage people to socialise outdoors at night, contributing to a community's night-time economy (5).
- An ARUP study led to the development of an evidence-based methodology - NVA - that, if applied, enables the design of light and urban infrastructure to address people's needs and make our cities sustainable and more inclusive (6).

Read more:

[Light at night: the importance of quality lighting and night preservation](#), Global Lighting Association, October 2020

3. [Lighting is considered more important than police officers to increase security](#), Lighting Sweden, 4 November 2021

4. [Sweden's scariest place is in Stockholm](#), Lighting Sweden, 22 November 2021

5. [Cities Alive – Lighting the urban night-time](#), Arup 2017-06-27

6. [How can lighting make our cities more inclusive?](#), Arup



SDG-12 | Ensure sustainable consumption and production patterns

The lighting industry continues to innovate to improve the sustainability of our manufacturing and products and allow people to benefit from quality lighting for longer and at an affordable price.

The average lifetime of lighting has increased by a factor of 50 over the past 15 years. An LED light bulb has a lifetime of up to 50.000 hours – assuming you use your lights 10 hours a day, that's a total lifetime of almost 14 years. Sensors and controls can help manage lighting to be used when and where it is needed, thus further extending the lifetime.

In the past 40 years, LightingEurope members have reduced the amount of mercury in their products by 98%.

The transition to LEDs, an electronics technology, enables the design and manufacturing of more compact products and delivers material efficiency.

SDG-13 | Take urgent action to combat climate change and its impacts



The biggest environmental impact of lighting throughout its entire lifecycle occurs during the use phase. With the roll-out of LED technology, the lighting industry has prolonged lifetime and reduced energy consumption drastically.

A further accelerated transition to LED lighting systems that combine controls and sensors will lead to an immediate, significant and measurable reduction in energy use and its associated cost and will make a direct contribution to a carbon neutral world.

The European Commission estimated total annual electricity savings for optimized lighting system designs with controls of between 20-29 TWh per year in 2030 and 48-56 TWh per year in 2050 (7).

Our actions under SDG 7 make a direct contribution to this SDG also.

7. [Preparatory study on lighting systems 'Lot 37'](#), VITO et al for European Commission, 15 December 2016

SDG-15 | Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss

Human activity has an impact on our surroundings. Good lighting design and quality lighting technologies prevent light pollution by adapting the color and intensity of the lighting and directing it to the place it is needed at the time that it is needed.

Lighting technologies can help grow food. Lighting technologies disinfect air and surfaces and help preserve food for longer. By using lighting to produce, distribute and store food, we can limit the use of pesticides and the chemicals used in food preservation.



SDG-17 | Strengthen the means of implementation and revitalize the global partnership for sustainable development

Lighting manufacturers engage in trade associations nationally, regionally and at the global level to share their expertise and contribute to policies and laws that deliver on the global commitment to the UN SDGs. They draft standards and norms to have a harmonized way of developing and measuring their products against regulatory requirements.

These associations collaborate with public authorities, other industries and sectors, and with non-governmental interest groups to forge a consensus on the most effective means to achieve the UN SDGs.

