

LIGHTING

BRING BACK THE NIGHT

Today, light pollution is one of the fastest-growing forms of pollution on the planet. It is growing at a rate twice that of the population growth. That yellow/white hue which bleeds from a distance into the dark night sky is a familiar foe with 99% of the population in Europe and North America, writes *Aimee Corcoran, lighting designer at Wink Lighting and the SLL representative in Ireland.*

Satellite measurements indicated that light levels in Ireland have increased by almost 60% over the period 1995 to 2015, mainly due to the increased development during the boom years. Interestingly, the growth of public lighting in the Republic of Ireland is 10 times faster than that of Northern Ireland.

The perception is that LEDs will be more efficient and thus cost-effective to retrofit existing sodium street lights. However, these powerful LEDs are rarely dimmable or shielded and emit too-blue a light which makes the plan not fit for purpose.

Through scientific research and technological advancements over the years, it is becoming increasingly clear that light pollution and blue light can have harmful effects on the environment, humans, animals, insects and marine life.

This light also affects our circadian rhythms negatively. Bird migration routes are disturbed. Bat feeding patterns are disrupted. Coral spawns are agitated. It affects all beings, diurnal and nocturnal.

International Dark-Sky Association (IDA) is a global authority board which was established to protect and promote the night sky from light pollution. The IDA has developed a number of pillars which determine light pollution and they can be defined as follows:

- Glare: excessive brightness that causes visual discomfort;

- Sky glow: brightening of the night sky over populous areas;
 - Light trespass: light falling where it is not intended or needed;
 - Light clutter: bright and excessive light fixtures in an area.
- We can reduce light pollution by considering the following options:

Shielding

All exterior luminaires should direct light downwards. Any fittings that have light



spill should be fitted with shields so the light does not spread in unnecessary areas.

Set appropriate light levels

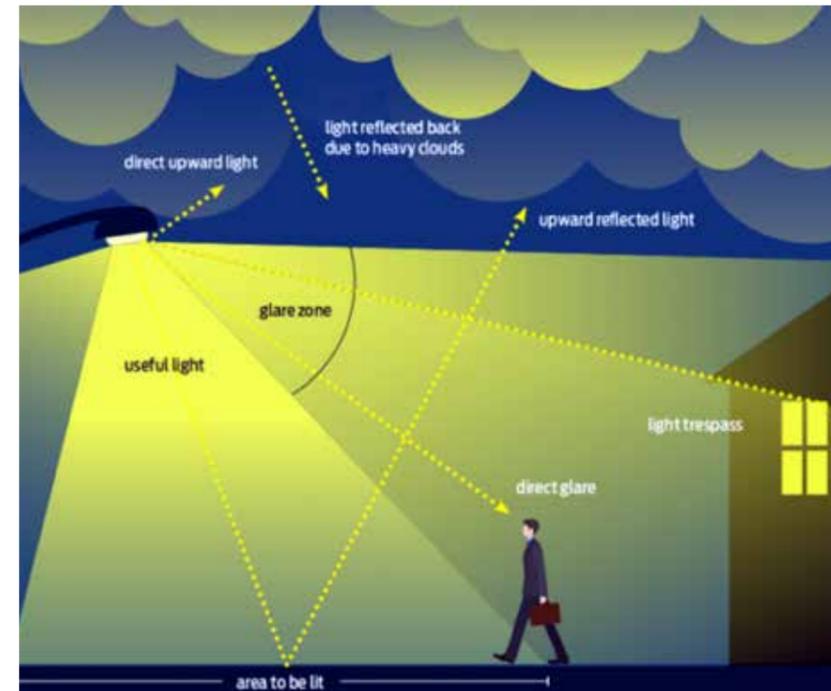
Studies should be carried out to achieve sufficient light levels in required areas as opposed to blasting all areas with light. It is important to create a lighting hierarchy to create depths of perception.

Consider light colour temperature

Colour temperature is an important aspect in lighting applications. The warmer (red) the light, the higher the proportion of longer wavelengths. The cooler (blue) the



Bortle dark sky scale.



The four components of light pollution.

light, the higher the proportion of shorter wavelengths. The shorter the wavelength, the further this will travel in the night sky.

There are some interesting initiatives happening in Paris and Copenhagen to mitigate the effects of light pollution. For instance, France has brought in legislation

to deal with upward light emission, glare, light trespassing and restrictions on the emission of blue rich light. It also proposes light curfews where fittings are turned off, dimmed or motion activated where possible (<https://www.darksky.org/france-light-pollution-law-2018/>).



Light pollution is common in urban and rural areas.

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Not only that, but parkour activists are jumping and scaling buildings to turn off retail lighting of luxury shops during the current economic crisis (<https://www.nytimes.com/2022/10/13/world/europe/paris-energy-conservation-parkour.html>).

In a municipality outside Copenhagen, Light Bureau has found a compromise between humans and bats. It has developed an innovative solution using red light to illuminate a cycle highway where there are many feeding and roosting bat species. Scientific research has shown that bandwidth of light in the red spectrum does not harm wildlife and it also preserves our dark adaptation during night time viewing (<https://afry.com/en/project/bat-friendly-lighting-in-gladsaxe-denmark>; <https://blog.meetstargazers.com/posts/dark-adaptation>; <https://nambiti.com/2018/12/11/red-light-at-night-game-viewers-delight/>).

Ireland is home to two internationally-recognised dark sky places – Kerry International Dark Sky Reserve and Mayo International Dark Sky Park. Both have been awarded a gold tier for the quality of their night skies which are free from light pollution and are important assets of natural night sky heritage.

Not all areas of Ireland can achieve gold tier status. However, there is much we can do to strive to get closer to this position, especially to aid with the current energy

crisis. Designers should now be considering the following:

- Use LEDs which are 2700K or less;
- Conduct light studies to efficiently light a space that is fit for purpose;
- Light plans should be user-orientated;
- Lower light levels in residential areas;
- Consider whether fittings can be turned off completely at night;
- Internal lighting for office buildings should be turned off after the last occupant leaves the building;

- Green space lighting should be turned off after certain hours;
 - Sports pitch lighting should be turned off when the area is no longer in use.
- Whether it is a new plan, upgrade or retrofit, the external light fittings should be chosen on the merit of their light properties as opposed to the cost-cutting of value-engineered schemes. We should be striving to bring back the night, to elevate that connection once again between the night sky and terrestrial ecosystems. ■

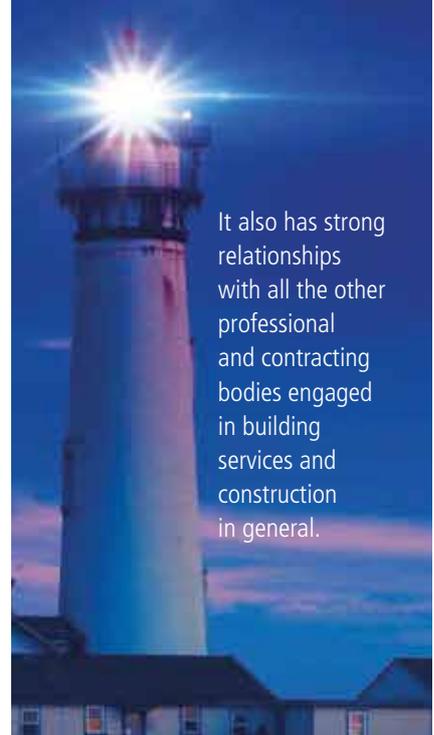


In a municipality outside Copenhagen, Light Bureau has found a compromise between humans and bats with a solution using red.



Example of good lighting design – focused light for resting, shielded light poles omit light spill, low level bollards illuminate the path.

Lighting Association Ireland (LAI) is an independent, non-profit organisation established to represent the collective views of member companies and professionals engaged in all aspects of the lighting industry in Ireland. It is the established voice of the sector and is regularly consulted by Government Departments, standards bodies and regulatory organisations.



It also has strong relationships with all the other professional and contracting bodies engaged in building services and construction in general.



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