

How can our society use artificial light at night in a way that is environmental friendly, healthy and socially acceptable?

With this flyer we offer practical recommendations to avoid most common mistakes in lighting at night.

The European Cooperation in Science and Technology (COST) Action ES1204 has brought together experts from such fields as lighting engineering, biology, ecology, health, urban planning, law, physics, astronomy and statistics to answer this question.

The issue of light pollution:  
There is a large body of evidence demonstrating

- the impact of artificial light on the human circadian system, which is linked to adverse consequences on sleep, performance and health,
- the disturbance of ecosystems due to much higher illumination levels and different temporal daylight patterns than existed when life evolved,
- monetary costs and energy consumption, pollution, carbon dioxide emissions and land-use changes associated with the production of electricity.

Find the full statement and more information at:  
<http://www.cost-lonne.eu>

To illuminate private or public outdoor areas in a way that is sustainable, healthy, and socially acceptable, the COST Action ES1204 LoNNe recommends:

0% uplight ratio (ULOR=0), avoidance of blue light, less than 500 nm and colour temperature below 3000 K and scientific justification of illuminance levels in EU standards, such as EN 13201 or ANSI/IES RP-8

# Light at Night Done Right

A user guide for outdoor illumination respecting the environment, our health and taxpayers' money



## Direction

1

Overhead lamps intended for public or private outdoor area lighting should never emit light directly above the horizontal and as little light as possible at shallow downward angles.

Upward light provides no benefit and light at shallow angles causes glare that reduces visibility. We recommend a general requirement of no direct "uplight" (i.e. ULOR=0 for all classes).

Light - including facade lighting - should always shine downwards.

Ground-recessed spotlights that radiate the light upward should be avoided.



~~DO NOT!~~



DO! ✓

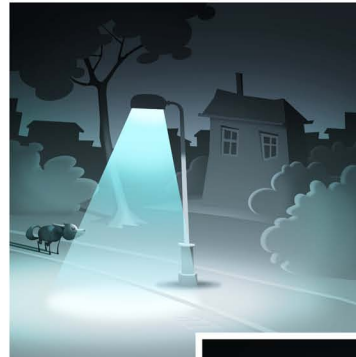
## Colour

2

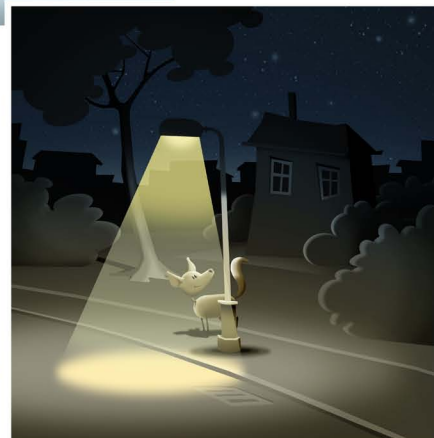
Exposure to bright light – and particularly light below a wavelength of 500 nm (blue) – should be avoided to the greatest practical degree during the evening and night. Lamps used for outdoor areas should have a correlated colour temperature of 3000 K or lower.

There are several reasons:

- Blue light is more glaring, especially for older individuals.
- The circadian system of mammals and humans is most sensitive to blue light.
- increases with the blue and UV light ratio.
- Blue photons are more likely to be scattered by the atmosphere and returned to Earth as skyglow.



~~DO NOT!~~



DO! ✓

## Intensity

3

Install controls to dim or turn off lights, when not in use. Use only as much light as is needed for the specific purpose.

Illuminance levels in standards for street lighting like the European Standard EN 13201 and the ANSI/IES RP-8 for the US need re-evaluation and scientific justification for the lighting levels they recommend, because:

- The illuminance levels of most lighting infrastructure in Europe are often lower than the recommendations in EN 13201, but nevertheless successfully address public safety needs.
- The energy and CO<sub>2</sub> emissions associated with outdoor lighting would increase dramatically if even the minimum limits recommended by the standards were adopted in all European countries.



~~DO NOT!~~



DO! ✓