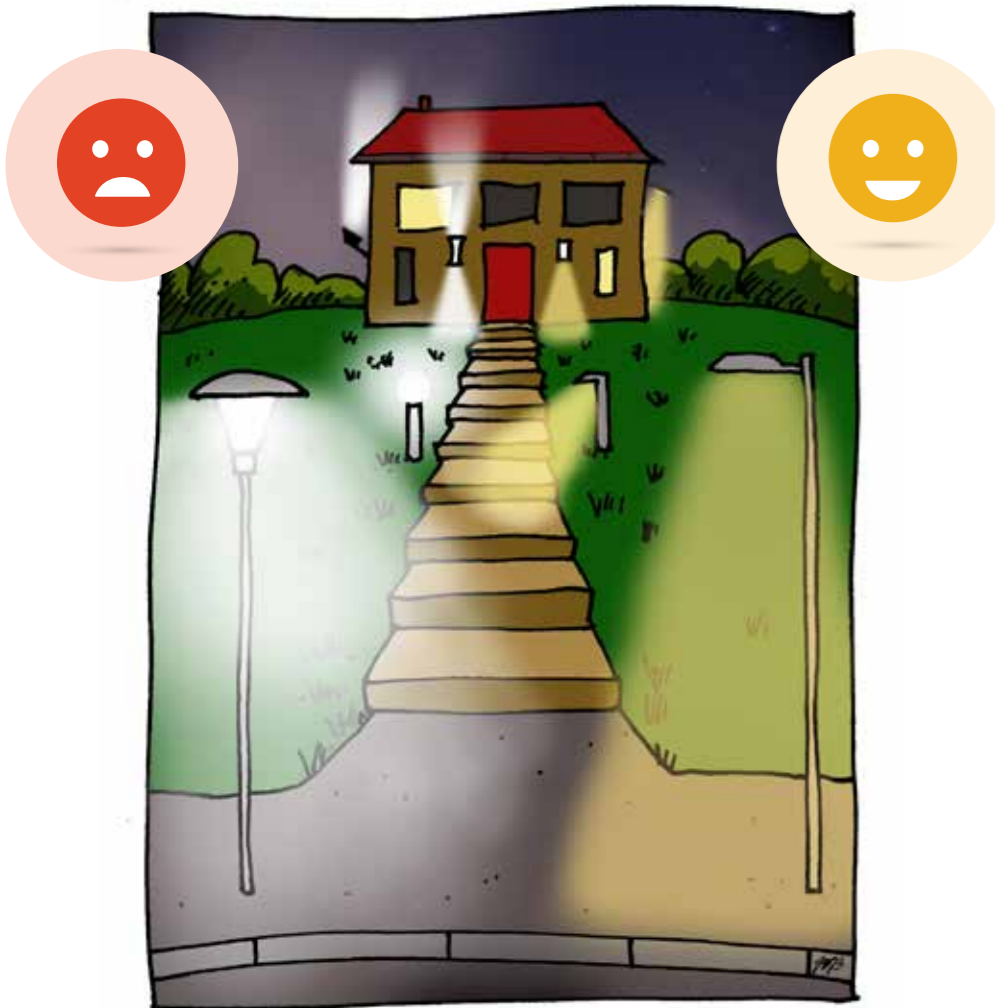


## LIGHT DIRECTION

Only from above, with the light source shielded on the sides

Aim light only where it is needed. Avoid glare by ensuring the light is aimed correctly and the light source is shielded horizontally (otherwise it is a danger to road traffic). Light should only be aimed from top to bottom to avoid stray illumination of surrounding buildings, the natural surroundings and the night sky.

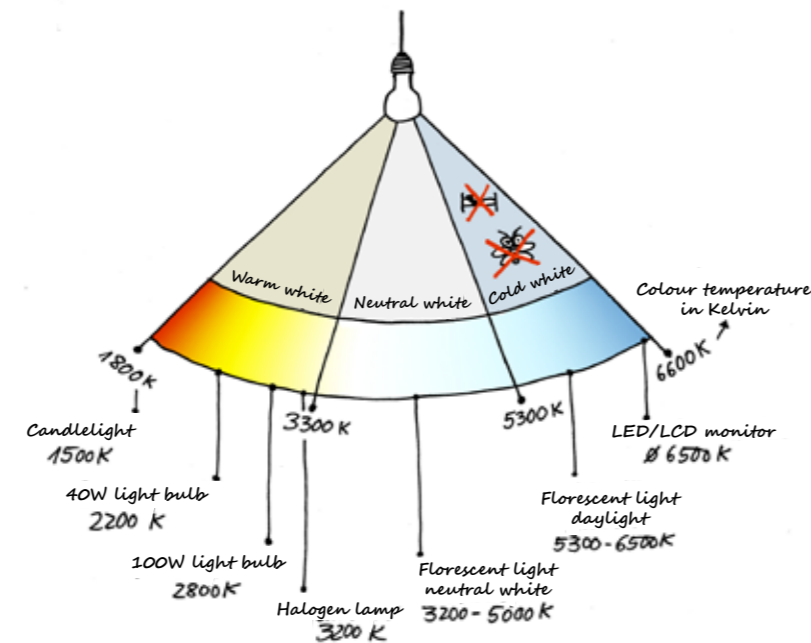


## LIGHT COLOUR

Warm white light for a low blue component

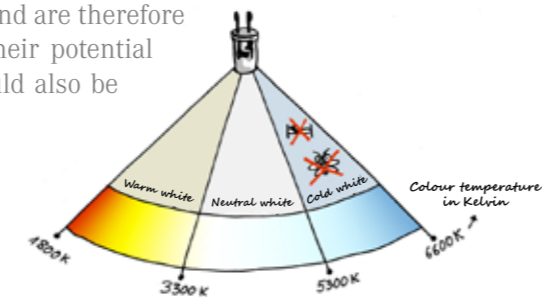
Humans perceive light predominantly in the yellow/green range (warm white light). Although cold white light is slightly more energy-efficient and increases colour perception at night a little bit, it contains blue components that interfere with melatonin production and disturb nocturnal insects.

**Recommendation:** Use warm white light with a colour temperature between 1,800 and 3,000 Kelvin.



### LED

LED lights cover the entire colour range, are energy-efficient and can be dimmed. Their high luminance requires proper light control so that they neither dazzle nor disturb. Warm white LEDs between 1,800 and 3,000 Kelvin contain less blue than cold white and are therefore recommended for outdoor use. Their potential for dimming/night reduction should also be taken advantage of.



## LIGHT POLLUTION AND ITS EFFECTS ON HUMANS AND THE NATURAL WORLD

The natural alternation of light/day and dark/night is the most basic rhythm of any form of life and an important element of functioning ecosystems. Interruptions always create a disruption. Light at night should therefore be used as low-impact and emission-free as possible.

### HEALTH

Too much artificial light can lead to massive disturbances in the day-night rhythm. This affects almost all body functions and is controlled by the hormone melatonin, which is only produced in the dark. Sufficient melatonin is important for healthy sleep and a strong immune system.



If melatonin production is disturbed at night by the influence of artificial light, this can lead to health problems such as exhaustion or metabolic disorders.



### NOCTURNAL ANIMALS

The lighting around the edges of residential settlements, industrial areas, leisure facilities, ski slopes and toboggan runs pushes animals further and further into dark areas, which are getting smaller and smaller.



- Less space for living, social interaction and foraging
- Disturbed rest periods
- Altered predator-prey relationship
- Migration and extinction of species is threatened

### NOCTURNAL INSECTS

If the light is too bright at night, the stars disappear and the insects mistakenly use artificial light sources for orientation. They compulsively fly at the bright sources of until they die of exhaustion or burn.



- The food supply for other animals is reduced
- Lack of flower pollination, with far-reaching consequences for the fauna and flora depending on it
- Extinction of species is threatened

### BIRDS

Migratory birds orientate themselves in the twilight and at night using the moon and the stars. Distracted by the many points of artificial light in our housing estates, they try to use these for orientation instead. Drawn into the light cones, the birds end up flying around in circles until they are exhausted, or collide with illuminated buildings or with other birds and then die.



- Disorientation of migratory birds
- Birds stay too long in resting areas and arrive too late in their breeding area
- Birds disturbed by garden lighting
- Disrupted birdsong and brooding periods
- Extinction of species is threatened

### LEGAL INFORMATION

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# BETTER LIGHT

ALTERNATIVES TO LIGHT SMOG



Guidelines for environmentally friendly outdoor lighting: shielded, warm white, moderate, energy efficient.



Natural night skies have become a rarity in Europe. In larger cities it is so bright that a crescent moon is no longer distinguishable from a full moon. The arcs of light are visible from a long way away and contribute to illuminating even distant natural areas. In Upper Austria there are areas where you can still admire the attraction of a natural night sky. For a long time artificial lighting was under the motto „more light“. However, the goal must be “better light”. Light that helps us to see better without dazzling, to preserve health, to ensure traffic safety, to avoid lighting the environment unnecessarily, not to disturb the wildlife and to save large amounts of energy and thus protect the climate.

As a supplement to the Austrian "Guide to outdoor lighting - light that does more good than harm", this brochure offers simple tips and recommendations.

Correctly used and targeted light is needed to reduce night-time illumination and maintain a healthy habitat for humans and animals, while retaining the impressive night landscape.



MORE DETAILS

AVAILABLE FROM PROVINCE OF UPPER AUSTRIA

Mag. Thomas Stelzer  
Governor

Stefan Kaineder  
Provincial councillor

BUSINESS PARK/INDUSTRY/SHOPPING MALL



INNER CITY



RESIDENTIAL STREET



DETACHED HOUSE



KEY PLANNING ISSUES



**WRONG:**  
**too much, too bright, undirected light**  
Strong lighting, bright illuminated signs and excessively bright (above-standard) street lighting, as well as light straying horizontally and upwards, disturbing neighbours and the natural environment in addition to wasting energy and money. Cold white light is particularly widely scattered and attracts many insects due to its high blue content, with negative consequences for the ecosystem.



**RIGHT:**  
**purpose-specific light, warm white colour, directional light**  
Light is aimed with as little intensity as possible - and can be dimmed - from above. Motion sensors reduce the light to the time that it is needed. Warm white light (between 1,800 and 3,000 Kelvin) reduces glare and creates a pleasant atmosphere. Reflective signs/markings save energy in contrast to illuminated/luminous features.



**DIMMED AT NIGHT CORE PERIOD WHEN NO LIGHT IS NEEDED:**  
Outside operating hours and during night core period, lighting should be reduced to the minimum required. Lighting that is not necessary (advertising, building illuminations, etc.) should be switched off completely.