



LIGHT POLLUTION IN THE NORTH SEA REGION

The North Sea is one of the busiest maritime regions in the world with urban areas, ports, industries and coastal tourism as well as key nature areas like the Wadden Sea and bird migration routes, making light pollution a shared, complex challenge.

WHAT IS LIGHT POLLUTION?

Of course, light at night is essential for safety, mobility and daily life. But when lighting is poorly designed or used in the wrong way, it becomes a major form of pollution: light pollution.

This refers to excessive or misdirected artificial light that alters the natural night environment. The term “Artificial Light at Night” (ALAN) is often used to describe lighting that contributes to this problem.

Light pollution typically takes four main forms:

- **Glare** — excessive brightness that causes visual discomfort
- **Skyglow** — the brightening of the night sky above towns, port, and cities
- **Light trespass** — light spilling into places where it is not intended or needed, such as homes or natural areas.
- **Clutter** — bright, confusing and excessive groupings of light sources

RESOURCES

- [DarkSky International: What is light pollution?](#)
- [European Commission: Light Pollution - Mitigation measures for environmental protection](#)



EFFECTS OF LIGHT POLLUTION

Light pollution can affect both nature and people in the North Sea region:

- **Biodiversity:** disrupting migration and reproductive cycles of birds, insects, marine species and other wildlife
- **Human health:** exposure to ALAN can interfere with sleep and circadian rhythms
- **Energy & climate:** wasted light means wasted electricity and unnecessary CO₂ emissions
- **Cultural heritage:** loss of the natural night sky and opportunities for stargazing
- **Economy:** higher operating costs for municipalities and ports; reduced potential for dark-sky tourism

RESOURCES

- [DarkSky International: Artificial Light at Night: State of the Science 2024](#)
- [DarkSky International: Effects of light pollution](#)
- [Programma naar een Rijke Waddenzee: Influence of ALAN on the Outstanding Universal Value of the Wadden Sea World Heritage](#)



CAUSES OF LIGHT POLLUTION



The North Sea coast includes some of the most brightly lit areas in Europe.

Possible main causes include:

- **Ports, industry & offshore energy:** large floodlit areas at the coast and “light islands” at sea operating around the clock, with lighting often spilling beyond the areas that need it
- **Urban growth & tourism:** expanding coastal towns with dense networks of transportation infrastructure, streetlights, greenhouses, private and commercial lighting and promenades
- **Unclear regulations & minimum standards:** in many places, there are no binding or incoherent rules for sustainable lighting or existing guidelines are too general to prevent excessive use
- **Low awareness & safety concerns:** decision-makers and operators can be unaware or underestimate the ecological, health and cost impacts of light pollution and often install lights “brighter than necessary” to address safety risks, even though good design could achieve the same goals with less light
- **LED spread:** LEDs save energy but are often brighter, blue-rich and used more extensively with higher brightness levels than older lighting

RESOURCES

- **DarkSky International:** Causes of light pollution
- **Programma naar een Rijke Waddenzee:** Influence of ALAN on the Outstanding Universal Value of the Wadden Sea World Heritage

GENERAL RECOMMENDATIONS

Light pollution can be reduced without compromising safety or functionality.

- **Plan before you light:** Only illuminate what truly needs lighting, avoid over-lighting
- **Direct light carefully:** Use fully shielded fixtures to shine light downward, not outward or upward
- **Choose better light:** warm colour temperatures (<3000 K) and avoid excessive brightness
- **Use adaptive systems:** Apply dimming, timers, or motion sensors to reduce light when not needed
- **Audit & replace:** Review existing lighting stock, phase out outdated fixtures, and update procurement guidelines

RESOURCES

- **European Commission:** Light Pollution - Mitigation measures for environmental protection
- **DARKER SKY** Principles for environmentally-sound lighting.
- **DarkSky International Guide:** 5 Principles for Responsible Outdoor Lighting.



- **Ministry of the Environment of the Czech Republic (2022):** Light pollution reduction measures in Europe
- **Schulte-Römer et al. (2019):** Lighting Professionals versus Light Pollution Experts? Investigating Views on an Emerging Environmental Concern