TOWARDS A DARK SKY STANDARD

A lighting guide to protect dark skies:

from local need to landscape impact



Cover Image – Cissbury Ring South Downs National Park. Neil Jones/SDNPA

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WHO IS THE DARK SKY STANDARD FOR?

This document provides advice for both domestic and non-domestic lighting. Anyone who designs, installs or manufactures lighting should find this useful.

Domestic users need only basic advice based on easy principles.

Non-domestic users may need more detailed and professional advice on design and installation**.**

WHAT DOES THE DARK SKY STANDARD DO?

This document does three main things:

1. describes the mind-set of environmental/dark skies awareness when installing exterior lighting;

2. sets basic principles of lighting to a dark-sky standard;

3. signposts existing standards, guidance and advice where needed and appropriate.

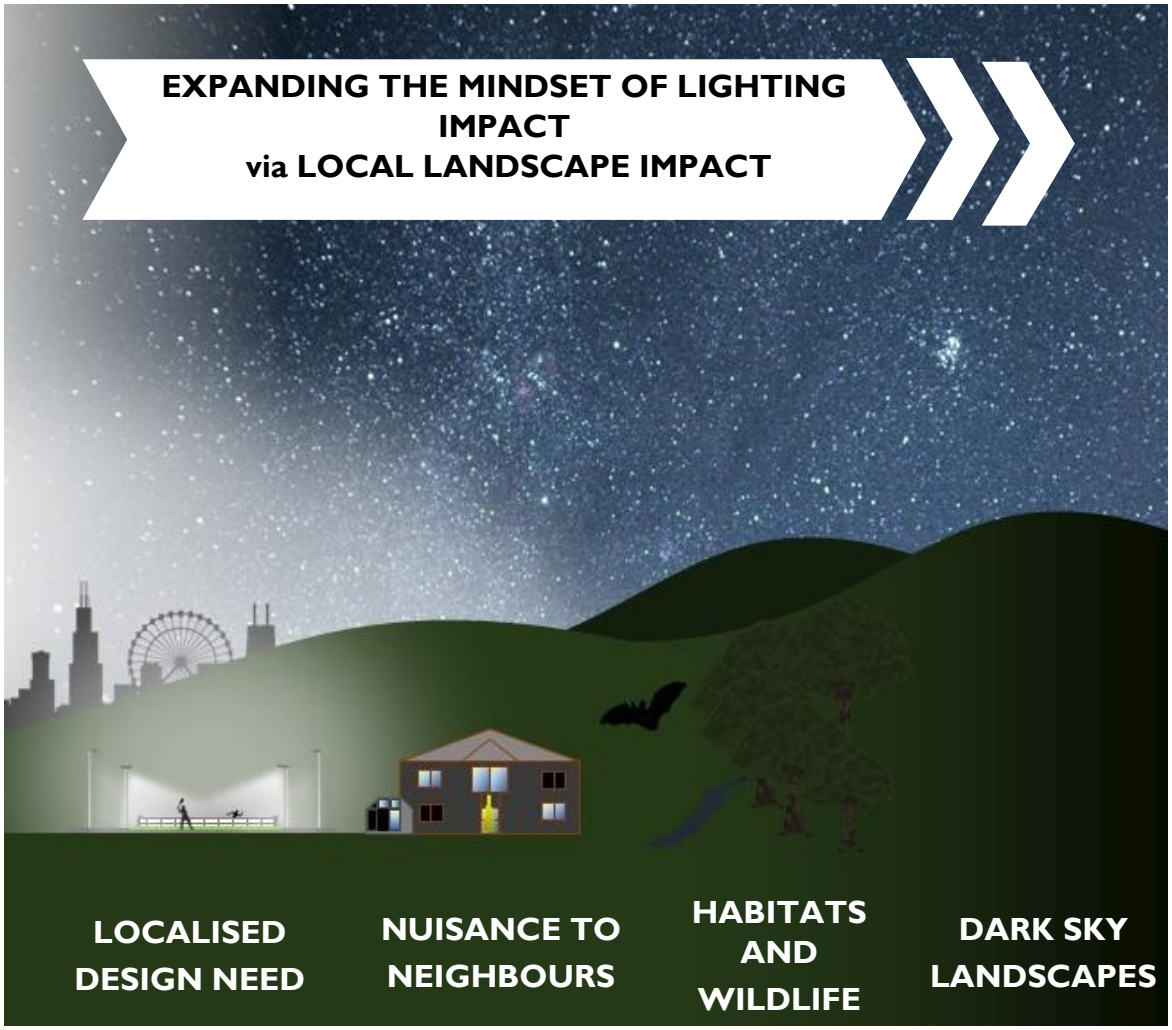


UNDERSTANDING THE PRO-DARKNESS MINDSET:

FROM LOCAL NEED TO LANDSCAPE IMPACT

When using exterior lighting, we need to consider the wider environment: the effects it will have on the surrounding landscape and the darkness of the night sky. It is important to consider not just the immediate area to be illuminated, but also the effects further away. In some cases lighting may not be appropriate, no matter how well designed, because the presence of light itself can significantly affect the surrounding environment.

TO EXPAND OUR VIEW OF THE UNIVERSE WE NEED TO EXPAND OUR CONSIDERATION OF LIGHTING IN OUR ENVIRONMENT



-BSI Standards - ILP 01: GN01/21 - Building Regulations - Advertising Regulations - Local Authority Plans - CIBSE SLL06 - Sports England	-ILP 01: GN01/21 - Statutory Nuisance	-NPPF - Ecological Assessment - ILP PLG04	-Dark Sky Place Planning Policies - IDA Guidelines

THE THREE MAIN TYPES OF LIGHT POLLUTION

1 - Sky glow

This is the brightening of the night sky which can be seen emanating from the horizon, originating mostly in built-up areas. It is caused by badly directed light sent above the horizontal and scattered by aerosols and particles in the air. It can also be reflecting from surfaces. Light that travels near the horizontal is the most damaging as it travels furthest through the lower, denser atmosphere. This can be avoided by ensuring that lights are directed downwards where the light is needed.



2 - Glare

This is the uncomfortable brightness of a light source when viewed against a contrasting darker background. In less densely populated rural areas, glare will seem relatively more intense than in urban areas. This is particularly noticeable when looking from raised viewpoints into the darker landscape below.



3 - Light Intrusion

Sometimes called 'light trespass', this involves light spilling beyond the property or area being lit. Although this pollution generally relates to windows and intrusion into private property, the term 'light intrusion' also applies to natural habitats and areas of high species interest.



Presence – a fourth consideration

Even if a lighting scheme were designed that avoided sky glow, intrusion and glare, there still exists the possibility of significant impact on dark and sensitive landscapes and wildlife due to the mere presence of the lights. This applies to impacts from both exterior and interior lighting. When the presence of lighting itself creates negative impacts, alternatives and re-siting should be considered.



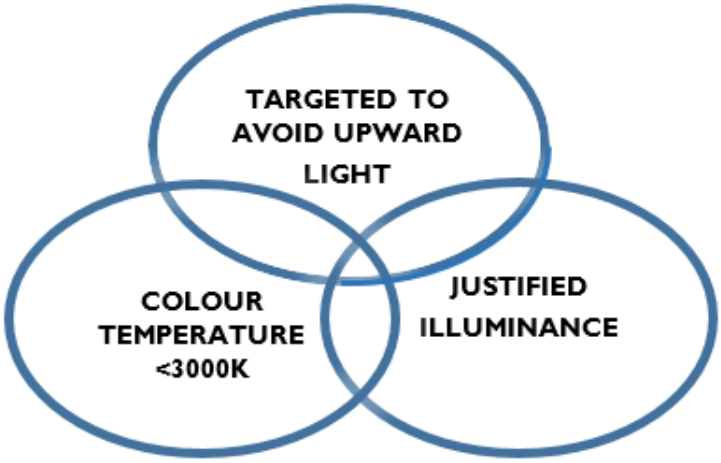
DARK SKY DESIGN LIGHTING PRINCIPLES

With any installation, domestic or otherwise, the *right light* should be the aim. The following best practice design principles should be followed to ensure good lighting that reduces light pollution and its impact on dark skies. They represent all the relevant lighting policies found within the signposted guidance documents.

- **USEFUL**
  - Any light should be justified with a clear purpose and benefit.
  - Overall lighting impact should be appropriate for its setting, regardless of the design.
- **DESIGNED**
  - For larger non-domestic installations, professional designers should be consulted to ensure that illuminance, and control of spill light and glare, are appropriate for the task. Use the minimum possible number of lights.
- **TARGETED**
  - Light should be directed to where it is needed and not spill into neighbouring spaces.
  - All light above the horizontal should be avoided. Zero **upward light is essential.**
- **LOW LIGHT**
  - Lux levels: lights should provide the right illuminance referenced against design standards. Do not use needlessly over-bright lights.
  - Glare: lights should be referenced against design standards and not produce unnecessary glare.
- **CONTROLLED**
  - When not needed: turn off with manual switches, timers or proximity (PIR) sensors.
  - Ensure lights are dimmed when activity is low, to reduce light and energy use.
- **COLOUR**
  - Lamps should be **3000K** or less. Lamps above 3000K (with increasingly blue component) should be avoided.

'THE RIGHT LIGHT IN THE RIGHT PLACE AT THE RIGHT TIME, UNDER THE RIGHT CONTROL'

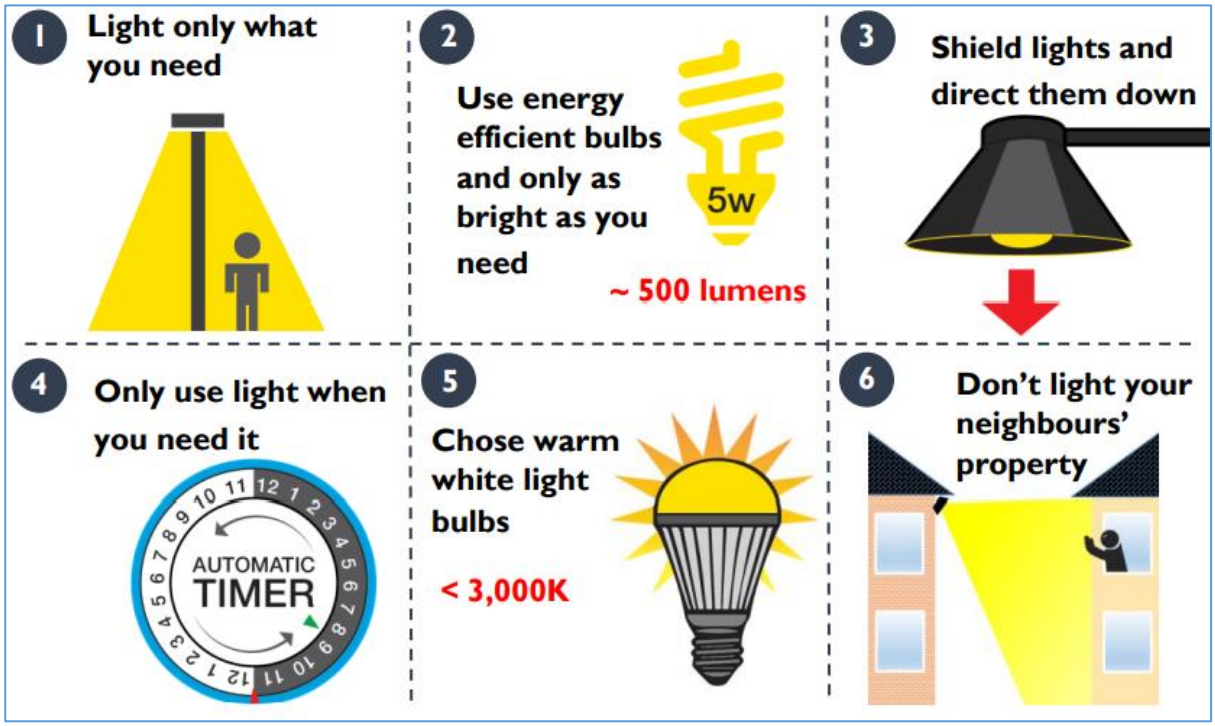
FROM ILPGN01



ADVICE FOR HOUSEHOLDS AND DOMESTIC USERS

The first consideration is whether lighting is needed at all. As minor fittings (see bottom of page for definition) are not generally subject to planning control, it is important that domestic users and homeowners understand the difference between good and bad domestic lighting. What can seem an enticing deal at the retailers can turn out to be inappropriate and a nuisance to neighbours. Moreover, it may negatively affect the night sky and the near environment. Residents often buy and install lighting that is more powerful than street lights and can have a more negative impact.

What would you do if your council installed a street light next to your bedroom window or back garden? You might well complain and ask for lighting that is no longer intrusive. Follow these simple steps to ensure good-neighbourly lighting that protects dark skies.



Minor lights

- 500 lumens (~5W LED) is fine for navigating the garden path, and 1,000 lumens (11W LED) is acceptable for those requiring a little more light for most uses, like parking the car and getting the keys in the door.

- You should not need a light greater than 1,500 lumens (~15w LED) for most domestic uses. Multiple low-powered lights in the right places are better than one bright light.

- Anything above 500 lumens should be fully shielded so that the light goes downwards.

- Proximity sensors such as infra-red (PIR) should be used to light only when needed.

- The box or packaging will usually state the lumens, watts and colour temperature

DESIGN THEMES FOR NON-DOMESTIC EXTERIOR LIGHTING

A good dark skies mind-set breaks lighting considerations into four main themes. Each theme will have a number of principles, key documents and other supporting resources that should be considered. The four themes are;

1 - DESIGN NEED

This theme considers

- Purpose
- Appropriate Illuminance
- Standards and Guidance's

2 – DARK SKY PLACES

This theme considers

- Sky Quality
- Colour (CCT)
- Justification

3 – LANDSCAPE AND WILDLIFE

This theme considers

- Habitat Impact
- Landscape Disruption
- Sensitive Species

4 – NUISANCE AND OBTRUSION

This theme considers

- Spill
- Intensity
- Upward light

Good lighting design for dark skies needs to be well designed, meet existing standards and take into account the wider landscape. The four themes above are important things to consider when designing, choosing and installing your lighting to minimise light pollution.

The following sections will signpost essential documents and other supporting resources to achieve good design.


1 - DESIGN NEED
Purpose
Appropriate Illuminance
Standard- and Guidance-led
3 - LANDSCAPE AND WILDLIFE
Habitat Impact
Landscape Disruption
Sensitive Species
GOOD LIGHTING
2 - DARK SKY PLACES
Sky Quality
Colour (CCT)
Justification
4 - NUISANCE AND OBTRUSION
Spill
Intensity
Upward Light

1 - DESIGN NEEDS

Key documents

- **BSI - Light and lighting of work places: BS EN 12464-2:2014**
  This standard sets specific requirements for lighting of tasks in most outdoor work places and their associated areas in terms of quantity and quality of illumination. Section 5 provides the lighting requirements for various tasks, e.g. farmyards, pedestrian walkways.
  For specific dark sky references, see Section 4.5: Obtrusive Light

- **BSI – Code of practice for the design of road lighting. BS 5489-1:2013**
  This standard sets recommendations for general principles of road lighting and its aesthetic and technical aspects and advises on operation and maintenance.
  For specific dark sky reference, see Section: 4.3.5: Obtrusive Light

Supporting Resources and Documents

- **HSE – Lighting at Work HGS38.**
  This guidance explains how lighting contributes to the health and safety of people at work. It deals with assessing and managing the health and safety risks attributable to lighting in the workplace, good practice and the minimum recommended illumination levels that meet H&S requirements.

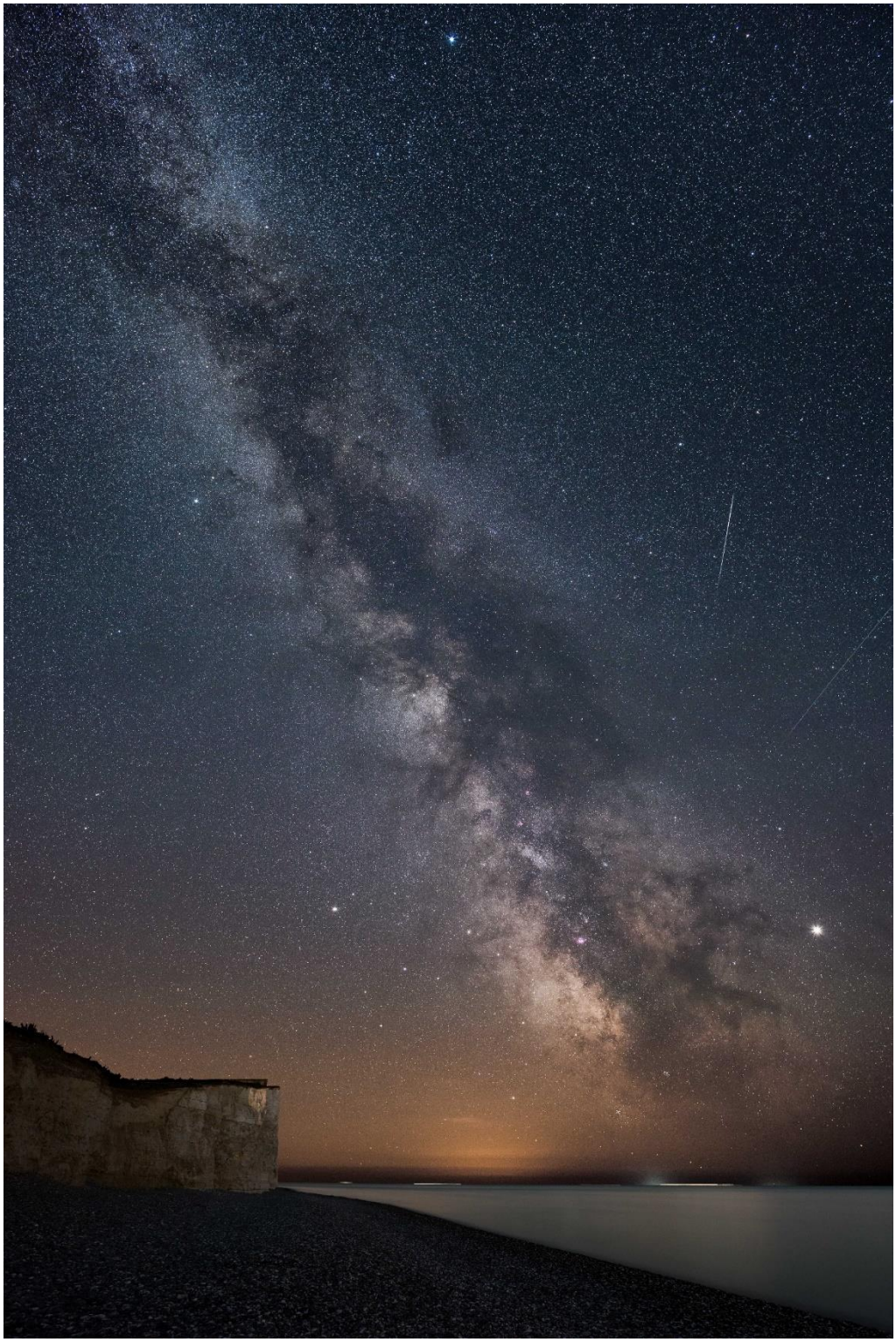
- **Sport England – Design Guidance Notes: Artificial Sports Lighting**
  This Design Guidance Note considers artificial sports lighting for both internal and external sports activities and identifies those that have special requirements. Recommended illuminances for activities are provided.

- **CIBSE: SLL: LG06: The exterior environment (2016)**
  The guide aims to provide readers with a firm foundation from which to approach exterior lighting design. Since light source technology is advancing rapidly, the guide provides a holistic approach to the design of the exterior environment, rather than concentrating on product performance, which quickly becomes out of date.

- **Local Lighting Authority (LLA) – Street lighting policies**
  The Local Lighting Authority will often have a design specification for lighting – mainly for road lighting. While they usually reference BSI standards (see above), some LLAs will have specific requirements for lighting within dark places, particularly in terms of colour temperature and upward light.

- **Illuminated Adverts**
  The Illuminated Advert regulations covered by the Town and Country Planning (control of advertisements) (England) 2007, discuss the specifications for installation. Luminances and controls are recommended for different ambient lighting zones. The ILP has guidance for all of the UK and Ireland: PLG05: the brightness of Illuminated advertisements

- **Secured By Design – Lighting Guide**
  This guide, produced by Police Crime Prevention Initiatives, aims to increase awareness of security, public safety and lighting. It recognises the need to balance different objectives and incorporates the requirement to avoid causing light pollution in the design of buildings, estates and public spaces.



Birling Gap - Credit John Fox/SDNPA

2 - DARK SKY PLACES

Key documents

- **IDA Dark Sky Places: Guidance**
  Designated IDA places must set policies, usually planning policies, to comply with the accreditation. The managing authority will set policies (usually a planning authority or consultee). Any lighting schemes within these places should comply with dark sky policies. **These are important documents to use in creating a lighting design**

- **Local Authority Local Plan: Policies**
  Local Plan policies by Planning Authorities may include strategic policies to protect dark skies. They set the overall approach to lighting within the authority and may be accompanied by very detailed Supplementary Planning Guidance (SPG) or Technical Advice Notes (TAN), which should be used. **These should not be omitted in a design.**

Supporting Resources and Documents

- Commission for Dark Skies (CfDS)
  The Commission for Dark Skies provides advice and further information on dark skies and lighting. The handbook "Blinded by the Light?" (see Downloads on the website) has guidance for friends of the natural environment who want to understand the issue.
- International Dark-Sky Association (IDA)
  The International Dark-Sky Association (IDA) provides guidance for sky quality protection and sets the guidelines for all IDA designated places in the UK (Reserves, Parks and Communities). The IDA uses five principles to underpin its guidelines



3 - LANDSCAPE AND WILDLIFE

Key documents

- **Ecological Assessment**
  In wildlife sensitive areas such as National Parks, the Broads, AONBs, National Nature Reserves or protected habitats, consideration to local species must be given. Consideration must be given to the impact of lighting on these areas and the wildlife that inhabits them. This is usually determined by an Ecological Assessment undertaken by a competent and qualified ecologist.

- **ILP Guidance on Undertaking Environmental Lighting Impact Assessments**
  In sensitive wildlife areas such as National Parks, AONBs, National Nature Reserves or protected landscapes, sufficient consideration should be given to appropriate lighting plans. This guidance provides advice on both rural and urban environmental impacts.

- **National Planning Policy Framework**
  In any application that includes lighting schemes, the National Planning Policy Framework should be a primary consideration. The NPPF makes reference to lighting, in paragraph 180(c):

  > **"limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation."**

  Local Plans and specific policies on dark skies (see theme 2) within designated places will provide more precise requirements.

Supporting Resources and Documents

- **CPRE: Shedding Light**
  This document summarises a survey of local authority approaches to lighting in England. The survey has provided a better understanding of how decisions are made about lighting at the local level, including how lighting is dealt with in local planning and how local authorities are working to make street lighting more energy- and cost-efficient.

- **CPRE Night Blight: Reclaiming our dark skies**
  These are interactive maps of England's light pollution and dark skies.
  The maps are based on data captured in September 2015 at 1.30 am.
  They indicate the location of dark skies for which protection policies and effective lighting designs should be achieved. Note that many NPs and AONBs will be relatively darker due to their rural nature.

4 - NUISANCE AND OBTRUSION

Key documents

- **Institution of Lighting Professionals GN01/21 The Reduction of Obtrusive Light**
  This widely used and referenced guidance note specifies limitations and recommendations for lighting to prevent obtrusive light. It also considers industry comment regarding the assessment and definition of obtrusive lighting.

  > **"Good lighting practice is the provision of the right light, at the right time, in the right place, controlled by the right system."**

  It establishes upward light, intensity and illuminance criteria for lighting zones.

- **Clean Neighbourhoods and Environment Act 2005 – Statutory Nuisance**
  This statutory legislation specifies that installations be avoided where 'artificial light emitted from premises (is) prejudicial to health or a nuisance.' (Section 102 (2)(fb)). To avoid enforcement by the local authority, lights should be pointing in the right direction and be appropriate for use.

- **Building Regulations**
  If you are installing an external light which is supplied from your electrical system, then you should ensure reasonable provisions are made to enable effective control and/or use of energy efficient lamps. One recommended option is to install a light **not exceeding 150W per light fitting** (which is excessive for most LED domestic uses) where the lighting automatically switches off, both when there is enough daylight and also when it is not required at night.

Supporting Documents and Resources

- **ILP - GN09: Domestic exterior lighting: getting it right!**
  This leaflet advises on appropriate lighting for the task in hand, providing the level of illumination required but not becoming a cause for concern to adjacent residents or affecting the natural environment surrounding your property.

- **CIE 150 2017: Guide on the limitation of the effects of obtrusive light from outdoor lighting installations** This guide specifies limitations and requirements to prevent obtrusive lighting. The ILP guidance note GN01 ILP reflects many of the aspects within the CIE document.

DESIGN ADVICE FOR GLAZING

Light Spill from interiors

Light from inside dwellings and, increasingly, hotels can have a significant impact on night sky quality and the integrity of a dark landscape. It is pollution – it serves no purpose, nor benefits the external environment. While this pollution has received little attention in any specific guidance, this document aims to provide some mitigation and considerations.

Key documents

- **BSI - Light and lighting of work places BS EN 12464-2:2011 Part 1: Indoor Work Places** This standard specific requirement gives information on lighting of tasks in most indoor work places and their associated areas in terms of quantity and quality of illumination.
- **CIBSE: SLL: LG Guides**
  This library of guides provides information on lighting for a number of internal applications.
- **Local Authority Policies and Supplementary Documents**
  Local Authorities may have specific policies on glazing within the landscape. Refer to policies within these documents to ensure good design.

General dark sky mitigations

- Consider automated blackout blinds and shutters.
  - Automated blackout blinds at night are a relatively low-cost and effective option for eliminating internal light spill without impacting on internal spaces.
  - Timers on blinds should be set for within one hour after sunset
  - They can be used either in the design phase, or post installation
- Break up continuous glazing by removal or use of external shutters and shields to try and keep the overall glazed area to less than 50% of the total elevation area
- Glazing should not exceed 25% of the floor area to meet energy efficiency building regulations (which does depend on thermal properties of the glass).
- Turn off internal lights when not needed or at close of business.
- **Any commercial greenhouse should have zero light spill.**

Using Visible Light Transmission (VLT)

Not all glass is the same. Depending on the internal space requirements, glazing will use different methods to control the transmission of visible light through the glass. This 'VLT' value of glass can be selected to minimise glazing impact while providing sufficient visible light for the purpose. (Tints provide a similar function). From a distance in a dark landscape, the impact from glazing spill can be similar to light emitted from an appropriately designed illuminated advertisement. Glazing should aim to meet the 'target VLT' for typical glazing types shown below, especially in remote dark landscapes.

- Visible Light Transmission (VLT) is a ratio/percentage that indicates the proportion of light passing through. It is usually expressed as a number between 0 and 1, where the higher the value, the more light passes through**. The lower the number the less internal spill**.

- Glazing manufacturers provide a range of VLT and tint options for a variety of needs. The recommendations above have been cross-referenced against retail options for their intended purposes to ensure optimal function.

- All glazing has a potential landscape impact either by disrupting the dark landscape with point sources, or through the spill of light into the air. Generally, the smaller the glazing with lower internal illuminance levels will disrupt the landscape less and have a low impact. Larger glazed elevations with brighter internal illuminance will stand out more and pollute more. Even with the appropriate VLT there could still be a landscape impact so further mitigations, e.g., black out blinds should be considered, particularly with greater potential landscape impact.

Glazing Type	**Potential Landscape Impact**	**Target VLT**
Normal Domestic Glazing	Low impact	~0.65
Large, continuous domestic glazing	Medium impact	0.4 to 0.65
Domestic roof lights and lanterns	Medium impact	0.4 to 0.5
Commercial sky lights	High Impact	~0.3
Small office and shoe fronts	Low Impact	~0.65
Structural glazing	Very high impact	~0.4

Notes:

For practical considerations of product options, the acceptable target and range is the **target VLT +/- 0.05**

The landscape impact of glazing will also depend upon the urban or rural setting which should be taken into account

Glazing Type Appearances

Normal Domestic Glazing. This is the glazing you would expect on a typical house. The landscape impact is low.



Large, continuous domestic glazing. This is a modern style of domestic glazing where entire elevations of a house are glazing. The landscape is medium as there is more potential for harm than normal domestic glazing.



Domestic roof lights and lanterns. These are small roof-lights or lanterns used on a house. The landscape impact is medium as it is more than normal domestic glazing as it tends to point upwards.



Commercial sky lights. These are modular and continuous roof lights used in larger buildings. The landscape impact is high.



Small office and shop fronts. This is glazing used on typical high street shops and offices. They are similar in size to those on domestic buildings. The landscape impact is low.



Structural glazing. This is glazing that is found on large offices where the glass is a structural component of the building. The landscape impact is very high.



BASIC LIGHTING DESIGN FLOW CHARTS

These flow charts will help you develop a lighting installation that is good for dark skies.

External lighting flow chart

JUSTIFY THE LIGHTING

- There must be a clear justification for the lighting. It should serve a beneficial purpose and not be unnecessary.
- The need for planning permission should be checked.

DETERMINE LIGHTING TASK NEEDS

- Ensure that the lighting conforms to recommended illuminance, spill and glare levels in appropriate key documents, e.g. BSI 5489, 12464, Sports England using lowest levels necessary
- Ensure that critical dark skies criteria are included
  - Upward Light Ratio = 0
  - Correlated Colour Temperature of 3000K or less.

ASSESS LOCAL IMPACT

- Identify locations nearby where a lighting could be a direct (in view) or indirect visual nuisance for both humans and wildlife. Design to prevent.
- Ensure lighting complies with nuisance levels in key documents, i.e. ILP GN01, Building Regulations.

ASSESS LANDSCAPE IMPACT

- Identify sensitive wildlife sites and dark landscapes, e.g. IDA dark sky place, where lighting could reduce sky quality. Design to prevent.
- Ensure lighting complies to landscape constraints in key documents, i.e. Local Plans, Dark Sky Place guidance.

APPLY MITIGATIONS

Consider appropriate mitigations:
- Curfews and dimming regimes
- Proximity sensors
- Additional shielding.

CHECK THE PRESENCE IMPACT

- Does the lighting still represent a significant intrusion into a dark landscape? Consider alternatives to the whole design.

Internal Lighting Flow Chart

DETERMINE THE GLAZING TYPE

- What is the intended purpose of the glazing? Domestic/Commercial?
- Are there alternatives?



ASSESS THE GLAZING EXTENT

- Is the amount of glazing appropriate for the use and location?
- The decision should be based on analysis of the development in the landscape taking into account:
  - Landscape impact
  - Disruption to dark landscape continuity
  - Visible intrusion
  - Urban/rural density and remoteness
  - Shielding by vegetation and buildings.



SET RECOMMENDATIONS FOR VLT

- Use the table to set recommended factors for visible light transmission.



APPLY MITIGATIONS

- Determine and set additional mitigations (e.g. blackout blinds, hours of use).

LIGHTING PURCHASING RECOMMENDATIONS

You can't always trust 'Dark Sky Friendly' labels on products. Be careful when you shop for lights!. Here are some recommendations for purchasing lighting.

Watts and Lumens to achieve the right illumination (lux)

The table below recommends LED wattages (W) and lumen values (lm) to achieve approximate levels of illuminance for certain standardised tasks within an area. While they are more relevant to non-domestic installations, any householder should aim to purchase LEDs at the recommended level to achieve minimum lighting footprints. There are also special cases under Permitted Development, where non-domestic users are not subject to design controls. In these cases, the table should provide some guidance on correct purchasing. Note that when the area or the level of illumination increases and the potential impact is sufficiently high, a proper qualified and competent lighting specialist should be consulted for the design.

This table provides approximate values for areas listed in BSE and HSE documents, however, the user will remain responsible for the lighting and its use – **if in doubt and to verify levels, consult a professional lighting consultant. Remember – Buy 3000K or less!!**

Area to be illuminated sq m	(5 lux) Domestic areas, walkways	(10 lux) Domestic driveways, small car parks, traffic areas for slow moving vehicles	(20 lux) Farmyards, clearance and excavation	(50 lux) Loading and unloading, vehicle turning, construction areas, equipment sheds	(100 lux) Sports, fine detail and precision work*
25	3w 400lm	6w 500lm	11w 1000lm	30w 3000lm	CONSULT LIGHTING SPECIALIST
50	5w 500lm	11w 1000lm	23w 2500lm	60w 6500lm	CONSULT LIGHTING SPECIALIST
100	11w 1000lm	23w 2500lm	50w 5000lm	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST
250	30w 3000lm	60w 6500lm	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST
500	60w 6500lm	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST
1000	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST	CONSULT LIGHTING SPECIALIST

Notes

- Lighting using 11W or 1000 lumens is general a low risk
- Lighting above 11W and 1000 lumens but less than 60W and 6500 lumens is a medium risk
- Lighting above 60W and 6500 lumens is high risk. This lighting should be properly designed in consultation with a lighting specialist
- The comparable lumens approximations within the table are valid as of 2020. The efficacy of lumens per watt depends on available technology.
- A specialist lighting consultant should be used for any fine detail and precision work, due to the inherent risk. For sports use over 25 sq metre, 60W and 6500 lumens would be recommended.

IDA Fixture Seal of Approval

The IDA's Fixture Seal of Approval program provides objective, third party certification for lights that minimise glare, reduce light trespass and don't pollute the night sky.

All products approved in the program are required to be fully shielded and to minimize the amount of blue light in the night-time environment. IDA does not sell lighting and is not endorsing any of the lighting within this document – the seal is for demonstration only.

To find Dark Sky recommended lighting for use in the UK and Ireland, please visit www.darkskylighting.co.uk



GOOD AND BAD LIGHTING

There are many good lighting options available from retailers. A good lighting design should exclude installations that do not comply with the key lighting design principles in this document. The following IDA guidance illustrates what to look for.



ABOUT THE PARTNERSHIP

The UK Dark Skies Partnership (UKDSP, ukdarkskies.org.uk) is a collaborative forum of UK dark-sky places, including those with International Dark-Sky Association designations; relevant professional organisations; the Commission for Dark Skies; CPRE, the Countryside Charity; the Institution of Lighting Professionals and the Society of Light and Lighting. All support the work of the APPG of MPs for Dark Skies co-chaired by Andrew Griffith MP and the Astronomer Royal Lord Rees (appgdarkskies.co.uk). The primary aim of the UKDSP is to improve sky quality by reducing unnecessary and inappropriate light pollution through effective behavioural change, education and promotion of environmentally sensitive lighting.



ABBREVIATIONS AND GLOSSARY

Places and Organisations

AONB: Area of Outstanding Natural Beauty

APPG: All-Party Parliamentary Group

BSI: British Standards Institution, the UK's national standards body

CfDS: Commission for Dark Skies

CIBSE SLL: Chartered Institution of Building Services Engineers, Society for Light and Lighting

CIE: Commission Internationale de l'Eclairage (International Commission on Illumination)

CPRE: CPRE, The Countryside Charity

DNS: Dark Night Skies

HSE: Health and Safety Executive

IDA: International Dark-Sky Association

ILP: Institution of Lighting Professionals

LIA: Lighting Industry Association

LLA: Local Lighting Authority

NPA: National Park Authority

NPPF: National Planning Policy Framework

Technical Jargon made simple

CCT (K): Correlated Colour Temperature. Defines the colour, not brightness of a light source and is measured in kelvin (K)

FCO: Fully Cut-Off. Shielding that cuts off any upward light

LED: Light-Emitting Diode

Lumen: a measure of the total amount of light visible to the human eye from a lamp or light source

Lux: The measure of Illuminance of an area, or how bright a lit surface is

PIR: Proximity Infra-Red. Typically used to detect motion with a sensor

ULR: Upward Light Ratio. The fraction of light emitted above the horizontal

VLT: Visible Light Transmission. The amount of light passing through glazing