

## TALKING POINTS

# Find your way through the sustainability maze with this useful guide to areas of energy saving, plus a handy glossary of jargon words in lighting

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**IT IS UNFAIR** to expect designers to know everything around sustainability. They are confronted with a massively wide field and breadth of vision which makes mastery of energy saving and water efficiency almost impossible.

To take just one element, the full understanding of the role that efficient, effective and aesthetically right lighting design plays in the shifting culture of sustainability alone is extremely complex. But serious mistakes can happen when knowledge is not available.

Working with trusted partners – the knowledge holders – should prevent expensive errors and allow designers to focus on their strengths, guided as needed by the ‘keeper of the knowledge’ to bring out the best in any project.

At the same time, an expert partner can help designers to develop their expertise and knowledge through practical example and sharing technical nous, which should have a very positive effect on Continuing Professional Development.

### Focuses for sustainable design

**Lighting:** Lighting plays such a crucial role in design in that it leads the focus on sustainability. As the lighting events around the world demonstrate, the technology is moving rapidly and the rise of LED lighting presents huge benefits and challenges.

The case for LED lighting in any sustainable design project, where it can assure energy savings of up to 90 per cent over traditional products, is proven and so our advice is to think first about the lighting you want to achieve rather than the technology. The most efficient, sustainable light is the one not being used so it is clearly better to ‘design out’ unnecessary energy use.

While making best use of daylight sources, it is important to light the spaces for users and their tasks, which also demands agile investment in pleasing, light-friendly interior objects and surfaces. The technology that the expert partner specifies should facilitate layering of the light: ambient, then accent and task.

The designer should feel free to play a little inside and out and not be over-concerned with

uniformity, and while it’s important to follow the current regulations we use a big dose of common sense along with these.

The expert technical partner should always source lamps and LED luminaires in batches to ensure match in colour appearance and output while advising on best measurements and solutions for good colour rendering.

It is important for a designer to be at least superficially aware of the emergent LED lighting technologies, leaving the detail to the expert technical partner. One example is GaN on GaN, which makes it possible for the first time to design light sources that provide unprecedented colour performance and beam control – smaller, brighter, more beautiful and efficient than any previous lighting technology. GaN on GaN LED lamps have superior colour rendering and beam characteristics compared to lamps using LEDs created from non-native substrates.

**Intelligent controls:** Every commercial space can make significant, ongoing energy savings by installing light controls. Easy-to-install wireless control options provide quick retrofit solutions to help buildings meet and exceed building energy regulations requirements.

By incorporating lighting based on task performance and providing personal control of lighting and shading, commercial spaces can make a measurable difference to employee productivity and motivation.

The use of lighting controls is also an integral part of the National Calculation Method (NCM) that designers can use to calculate the Target Emissions Rating for any building and this is where dimming becomes a crucial element in energy efficiency.

The NCM has daylight-linked operation and occupancy control but, significantly, does not include controlled or constant illumination.

This is where dimming comes into its own as, whichever of the two metric methodologies is chosen, a dimmable system will deliver further energy savings that will count towards the Building Emissions Rating (BER).

Apart from lighting, any design project should be aware of the sustainability potential in other smart controls, particularly heating and ventilation. >

**Right** Fantasy Island: A family resort based in Ingoldmells, near Skegness. One of the UK largest amusement parks with 24 thrill-seeking rides, daily shows and Europe’s largest seven-day market, this huge site has electricity bills of more than £400,000 a year. Working with SaveMoneyCutCarbon, the park owners will save thousands of pounds over the next year, with additional savings coming from reduced maintenance over the long life of the new LEDs being installed





**Water management:** Sustainable design is crucial in areas where water needs to be managed efficiently, such as bathrooms, kitchens and shower rooms. Designers can benefit from expert technical knowledge of best technologies together with clear understanding of the needs for aesthetically pleasing solutions.

In our experience, there is an environmentally sound water-efficient solution for every setting that combines excellent, durable build-quality with the best water-flow technology and great looks.

These products utilise technology that reduces flow in taps and showers by up to 60 per cent when compared to conventional designs. Equally important, there should be no perceived difference in comfort.

### Useful lighting jargon buster

**Beam Angle:** A light source's measure of spread is known as the beam angle, it is measured in degrees. A light's beam angle is determined when its lux level drops to half of the intensity of the centre beam.

**Colour Rendering Index:** This quality of light refers to how colours of objects appear underneath a light. Light sources with a poor CRI – a lower number on the scale which goes from 0 to 100 – will change how some colours appear. The best quality comes at the top end of the scale, above 80. However, it is not an ideal index as it does not specify between different colours, and some colours might be distorted when others are not. CRI is the measurement of the ability of a light source to reproduce the colour's vibrancy accurately compared to the reference illuminant (natural light).

**Colour Temperature:** This term defines whether a light source appears 'cool', 'neutral' or 'warm'; this is indicated by the Correlated Colour Temperature (CCT). Colour Temperature is measured on the Kelvin (K) scale, lamps with a warm appearance have a CCT of 2700-3000K, and are considered appropriate for domestic settings; neutral lamps of 4000K and cool lamps of around 6000K are used more often in offices and retail. Very cool

temperatures of 6000K plus can start to look almost blue-white and are used in car LED headlights.

**Dimmable:** Dimmable lights can be adjusted to varying brightness levels using dimmer switches, so you can deliver different amounts of light for different occasions and times.

**Dimming range:** Ratio of minimum to maximum measured light, usually expressed as a percentage.

**Driver:** Auxiliary device(s) needed to operate and vary the intensity of light output from LED lamp source(s) by regulating the voltage and current powering the source.

**Intensity:** The quantity of light, in candelas, emitted by a source in specific directions. Using these values, a diagram can be compiled that provides a direct impression of the light distribution from a lamp / luminaire combination.

**LED:** LEDs first appeared as a practical electric component in the Sixties but technological advances mean that they are now the best choice for money-saving, ecological lighting. LED stands for 'light-emitting diode'.

**Load:** This is any device that draws power from a power distribution system, such as a lighting fixture from a power circuit.

**Lumen:** A lumen is the unit used to measure how bright a light source is. An easy way to illustrate this is to use a birthday candle as an example; a lamp that puts out one lumen of light is as bright as a birthday candle. A lamp that puts out 100 lumens of light is as bright as 100 candles. The higher the lumen stated for a lamp the brighter the light output.

**Lux:** The international system of units of illuminance is Lux. Lux is a measure of how much luminous flux (in lumens) is spread over a given area (in square metres). Specifically, lux informs you how much light is arriving on a surface. 1lm/m<sup>2</sup> equals 1 lx. Multiply an illuminance figure in lux by an amount of time in hours and you have a measure of exposure in lux hours – this can be extremely useful if you're looking after delicate objects or artefacts that can't be exposed to too much light.

**Rated life:** The average life span of a lighting product when operated at a nominal lamp voltage is classed as the rated life. A lamp's lifespan will vary depending on the type. The rated life of incandescent light bulbs are approximately one year and generally are very cheap to purchase, compared with an LED light that have a higher initial purchasing cost but will last for rated life of 10-years-plus or 40,000-plus hours.

**Shimmer:** Small changes in light intensity. This can usually only be noticed at medium to low light levels, and often only at the periphery of vision.

**Thermal management:** The overall process by which the heat generated by the LED is directed away from the semiconductor device and eventually removed from the fixture. It can be any mechanical means, either active or passive. **FX**

**Above left** Radisson Blu Stansted: LED lighting retrofit. SaveMoneyCutCarbon will aid the company's ambitious Think Planet global initiative in the UK and Ireland across its Radisson Blu and Park Inn by Radisson brands. The wide-ranging initiative focuses on reducing guest water usage, maximising the efficiency of hotel boilers and supporting roll out of LED lighting. The LED roll out alone means the electrical load at 32 UK hotels will be reduced by 3.67 million watts, saving more than £250,000, with downlights cut by 85-90 per cent and the tubes by 50 per cent.

**Above right** Hansgrohe: Water savings with style.

