# The Environmental and Health Effects of Lighting
## Resources and Guidance Documents

### A Lighting Council New Zealand Guidance Bulletin

There are many practical reference documents on light colour, spectra and lighting effects available from commercially independent organisations. Some of these are:

- Illuminating Engineering Society of North America (IESNA) – USA
- Institution of Lighting Professionals (ILP) – UK
- International Commission on Illumination (CIE) – Switzerland
- US Department of Energy (US-DoE) - USA
- Illuminating Engineering Society of Australia and NZ (IESANZ) - AU and NZ
- Institute of Public Works Engineering Australasia (IPWEA) – AU and NZ

The following are statements issued by government, academic and NGO experts on this topic:

**U.S. Department of Energy Posting, June 21, 2016**
https://www.energy.gov/sites/prod/files/2016/06/f32/postings_06-21-16.pdf
The U.S. Department of Energy (DOE), explains that there is nothing different about the blue light emitted by LEDs as compared to other sources with blue-rich content. They also indicate that there is nothing inherently dangerous about LED lighting and that it should be used with the same prudence with which we use any other technology. DOE also indicates that lighting products with low CCTs may result in light that no longer appears white and colours can be substantially distorted, reducing visibility. In this case, higher lighting levels may be required, which may negate the effects of reducing the relative amount of short wavelength "blue" emission.

**True Colors, LEDs and the relationship between CCT, CRI, optical safety, material degradation, and photobiological stimulation - October 2014**
https://www.osti.gov/scitech/biblio/1165332

**Street Lighting and Blue Light Frequently Asked Questions - February 2017**
https://energy.gov/sites/prod/files/2017/03/f34/Street%20Lighting%20and%20Blue%20Light%20FAQs.pdf.

**Presentation – US-DoE Bruce Kinzey: Addressing the Concerns Over Blue Light – 2018**
https://www.energy.gov/sites/prod/files/2018/05/f51/lfi2018_kinzey.pdf

**Illuminating Engineering Society of North America – Updates - June 2016**
https://www.ies.org/policy/policy-briefsdocuments/response-to-ama-report-on-outdoor-lighting/
IESNA expresses concern with the varying degrees of information and misinformation about claims and recommendations in the AMA report specific to the use of blue-rich lighting. IES also questions if the references in the 2016 AMA are sufficient to justify the expanded recommendations from the 2012 AMA report.

**Lighting Research Center - New York, USA – Response June 2016**
https://www.lrc.rpi.edu/resources/newsroom/pr_story.asp?id=320#.W-uCza17EdU
The LRC suggests that CCT ignores nearly all important factors associated with light exposure and is only relevant to the perceived color of illumination. The LRC concludes that CCT should never be used to characterize light as a stimulus for blue light hazard. The LRC believes that there is not enough research available yet to reach firm conclusions about blue light and circadian disruption.

**Lam Partners Inc USA: Is LED Street Lighting Bad for Your Health? - June 2016**
http://www.lampartners.com/2016/06/29/is-led-street-lighting-bad-for-your-health/
This paper asserts that he AMA report cites no evidence that the intensity and duration of exposure typically experienced from street lighting are sufficient to have any melatonin-suppressing effect. He also cites a report from the Northwest Energy Efficiency Alliance concluding that 4100K LED street lighting resulted in significantly better ability of drivers to detect pedestrians at greater distances, compared to the other higher and lower colour temperatures tested. Mr. Heinmiller suggests that this might make 4100K the best choice from a safety standpoint on streets with pedestrians and cyclists.

**U.S. Department of Energy - Municipal Solid State Street Lighting Consortium - July 2016**
https://www.energy.gov/sites/prod/files/2016/07/f33/msslc_enews_jul2016.pdf
The Municipal Solid State Street Lighting Consortium (MSSLC) states that new LED luminaires with improved optical distribution emit only half (or less) of the light output of luminaires using conventional light sources (under USA conditions). Therefore, the reduction in light levels may reduce the overall melanopic output for the application even if there is an increase in blue spectral content of the source compared to traditional technologies.

**International Commission on Illumination (CIE**)
CIE 206-2014 The Effect of Spectral Power Distribution on Lighting for Urban and Pedestrian Areas
http://www.cie.co.at/publications/effect-spectral-power-distribution-lighting-urban-and-pedestrian-areas
CIE 126-1997 Guidelines for minimizing sky glow
http://www.cie.co.at/publications/guidelines-minimizing-sky-glow
CIE 150-2017 Guide on the Limitation of the Effects of Obtrusive Light from Outdoor Lighting Installations
http://www.cie.co.at/publications/guide-limitation-effects-obtrusive-light-outdoor-lighting-installations-2nd-edition

This Guidance Bulletin is provided to assist with accessible information about the characteristics and role of LED lighting in NZ conditions. www.lightingcouncil.org.nz

*Lighting Council New Zealand is the industry association representing twenty-eight lighting equipment importing and manufacturing companies in New Zealand. LCNZ was formed in 2003 in order to provide an informed and cohesive industry voice to inform and educate on lighting issues and to help navigate productively through the increasing complexity of lighting technology, standards and regulation.*