

December 27, 2021

BY EMAIL

Amy Ackerman, City Attorney
Corte Madera, California
aackerman@publiclawgroup.com

Re: The LED Fraud

Dear Amy Ackerman,

The natural night is a fundamental resource that is critical to the proper functioning of humans and nearly all biological systems. Artificial light is a pollutant that damages the natural night resource and greatly increases sickness, risk of cancer, mood disorders and premature births.¹

The claim that Light Emitting Diodes are energy efficient is fraudulent. According to the US Department of Energy's website, energy efficiency means "using less energy to get the same job done."² The job, in the case of streetlighting, is to provide uniform illumination with minimal harm. LEDs do not produce uniform illumination³, but rather they emit radiation from a flat surface which creates a mix of energies that are not uniform. Since LEDs do not do the same job as an incandescent or High-Pressure Sodium, **the claim that LEDs are energy efficient cannot be made.**

Consider the diagram of an incandescent light and LED radiation device as shown in Figure 1.

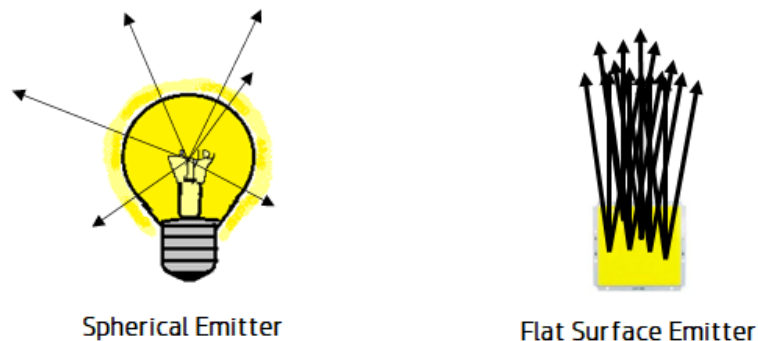


Figure 1 - Spherical vs. Flat Surface Emitter

¹ <https://www.softlights.org/resources>

² https://www.energystar.gov/about/about_energy_efficiency

³ <https://ieeexplore.ieee.org/document/8879542>

As shown in Figure 1, a spherical emitter sends light in all directions in space. Because of the curvature of the emitter, the light rays do not overlap, and the radiation is spatially, spectrally, and temporally uniform. A flat surface emitter, such as an LED, sends light only in the forward direction. The light rays are confined to an 'escape angle' which is determined by the physical characteristics of the chip. There are thus overlapping rays, with the most overlap being in the center of the chip, and the least overlap being on the edges. The result is that every point in space has different spatial, spectral, and temporal properties. This non-uniform radiation profile is not suitable for illumination and not compatible with the human nervous system. **An energy efficiency comparison between an incandescent or High-Pressure Sodium and an LED cannot be made.**

LED radiation is discriminatory because it interferes with human nerves and disrupts major life functions such as seeing, thinking, and concentrating for people with disabilities, such as those with epilepsy, autism, PTSD, migraines, bipolar disorder, and others. LED radiation prevents safe access to public services such as roads, sidewalks, and government facilities because it triggers epileptic seizures, migraines, psychological trauma, and thoughts of suicide.⁴

LED radiation is toxic and dangerous because it can have an exceedingly high peak radiance and because the emitted radiance is not uniform. As an example of how dangerous LED radiation is, consider this warning shown in Figure 2 from the company Gear Light.



Figure 2 - LED Flashlight

The regulatory meaning of light and illumination only applies to emitters that produce spatially uniform visible radiation. Figure 3 is a diagram showing the categorization of radiation.

⁴ <https://www.softlights.org/stories>

Regulatory Meaning of Light and Illumination

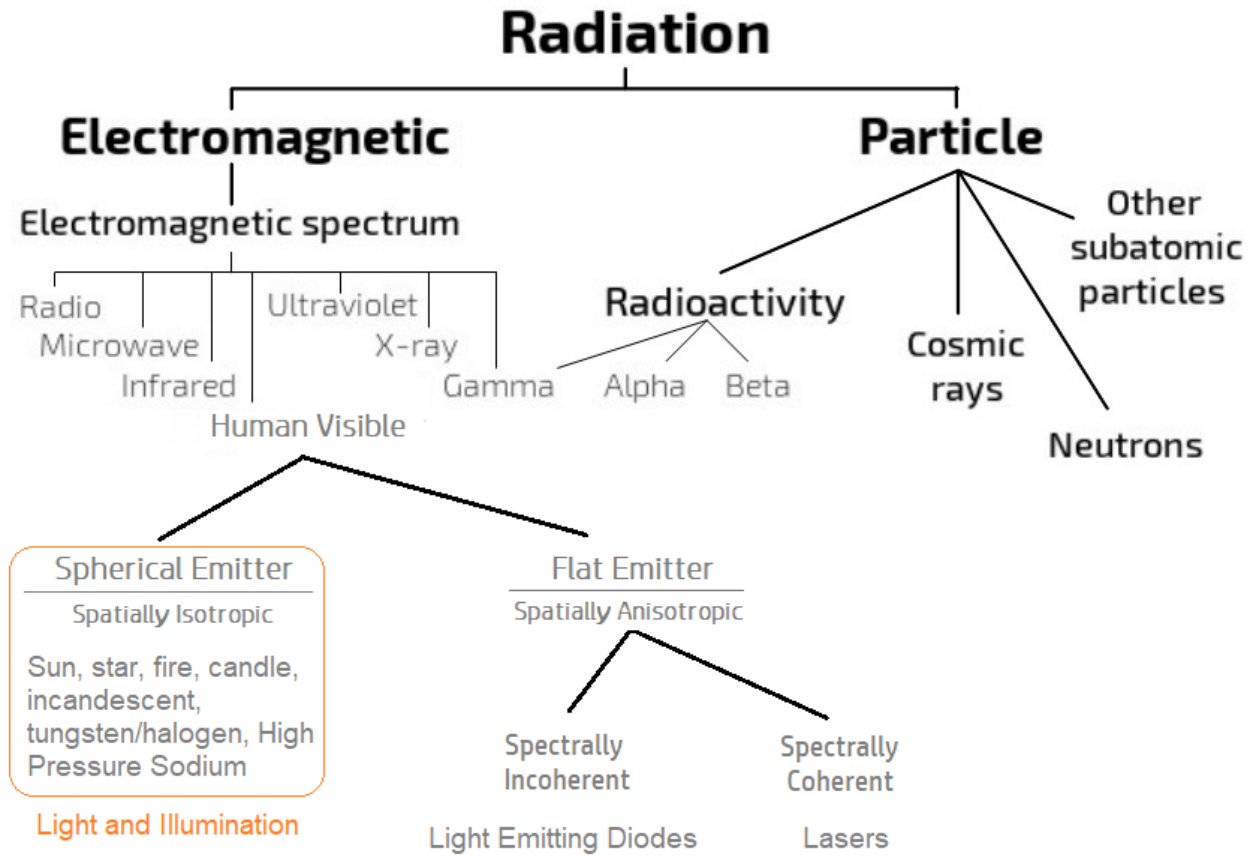


Figure 3 - Radiation Categories

A standard such as the Illuminating Engineering Society Recommended Practice for Design and Maintenance for Roadway Parking Facility Lighting (IES RP-8-18) is applicable only to the standard regulatory meaning of light and illumination and cannot be used for LED radiation devices.

LED radiation devices must not be used for the task of illumination because LED devices are not safe, they are discriminatory, and they are not energy efficient. The LED fraud is detailed on our website at www.softlights.org/led-fraud. The promotion by the city of the falsehood that LED streetlights are energy efficient makes the city liable for fraudulent claims. Failure by the city to ensure that the streetlights it authorizes emit uniform radiation, are safe, and non-discriminatory make the city vulnerable to discrimination lawsuits and liable for injuries caused by LED radiation.

Sincerely,

Mark Baker

Mark Baker
President
Soft Lights Foundation
www.softlights.org
mbaker@softlights.org