

January 8, 2022

BY EMAIL

Brad Hoylman, State Senator, Patricia Fahy, State Assemblymember
New York
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Re: S. 7663

Dear Brad Hoylman and Patricia Fahy,

Thank you for introducing S.7663, the Dark Skies Protection Act. This is an important step for protecting the natural night from the pollution of artificial light. The Soft Lights Foundation is an advocate for the protection of people and the natural night from the harms of LED light beams. We would like to provide you with additional information about the impacts of LED electromagnetic radiation and how the LED cartel has sold us the fraudulent claim that LEDs save energy.

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

In 2016, the American Medical Association published ground-breaking recommendations regarding LED radiation with a document titled Human and Environmental Effects of Light Emitting Diode (LED) Community Lighting.² This document stunned the world as it alerted the public to the toxicity of LED radiation, and the AMA recommended setting limits on this radiation. The LED cartel fought the AMA's recommendations and continues to do so. Since 2016, neither the government nor the LED cartel have taken appropriate steps to address the dangers of LED radiation.

The Soft Lights Foundation has concluded that the entire switch to LED is based on fraud. The idea that has been sold to the public is that LEDs are energy efficient or save energy compared to incandescent or High-Pressure Sodium and that LED radiation is safe and non-discriminatory. These are fraudulent claims.

According to the US Department of Energy's website, energy efficiency means "using less energy to get the same job done."³ The job is to provide uniform illumination with minimal harm. LEDs do not

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

² <https://www.ama-assn.org/sites/ama-assn.org/files/corp/media-browser/public/about-ama/councils/Council%20Reports/council-on-science-public-health/a16-csaph2.pdf>

³ https://www.energystar.gov/about/about_energy_efficiency

produce uniform illumination⁴, 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.** LEDs are simply a low quality, toxic, hazardous, and discriminatory type of visible radiation.

The left side of Figure 1 shows a spherical emitter that 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. Every single point on the sphere is the same as any other point. On the other hand, the right side of Figure 1 shows a flat surface emitter such as an LED, which has a middle and edges. This flat surface creates a situation where the middle of the chip has different energy than the edges of the chip. LEDs send light only in the forward direction and the light rays are confined to an 'escape angle' which is determined by the physical characteristics of the chip. Thus, there are 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. **An energy efficiency comparison between an incandescent or High-Pressure Sodium and an LED cannot be made.**

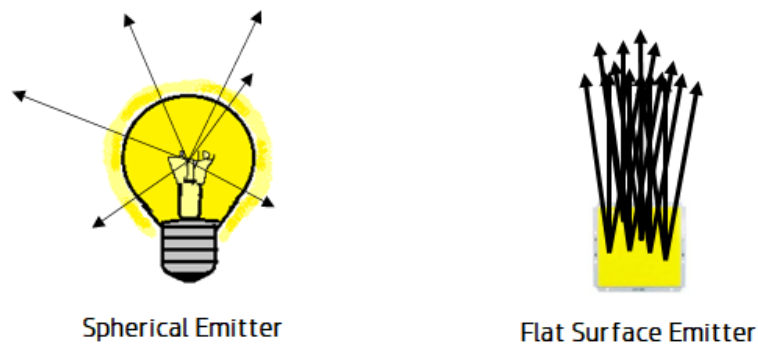


Figure 1 - Spherical vs. Flat Surface Emitter

Figure 2 shows the uniform spatial energy from candles, incandescent and High-Pressure Sodium versus the non-uniform spatial energy from an LED and LASER. The intense peak of energy will cause eye damage and will overload the nerve signals to the brain because the information is not uniform.

⁴ <https://ieeexplore.ieee.org/document/8879542>

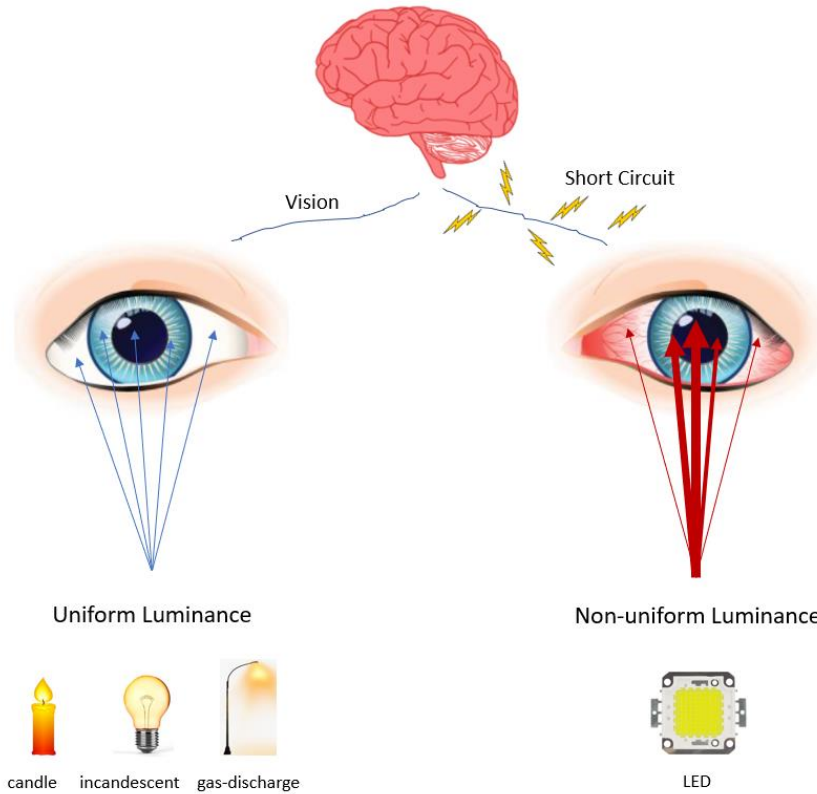


Figure 2 - Spatially Uniform v. Non-Uniform Radiation

Figure 3 is a diagram showing the categorization of radiation and shows that *light* and *illumination* are spatially isotropic radiation in the human visible portion of the electromagnetic spectrum. Radiation emitted by LEDs do not meet the regulatory meaning of or comply with standards for the use of light as illumination.

Regulatory Meaning of Light and Illumination

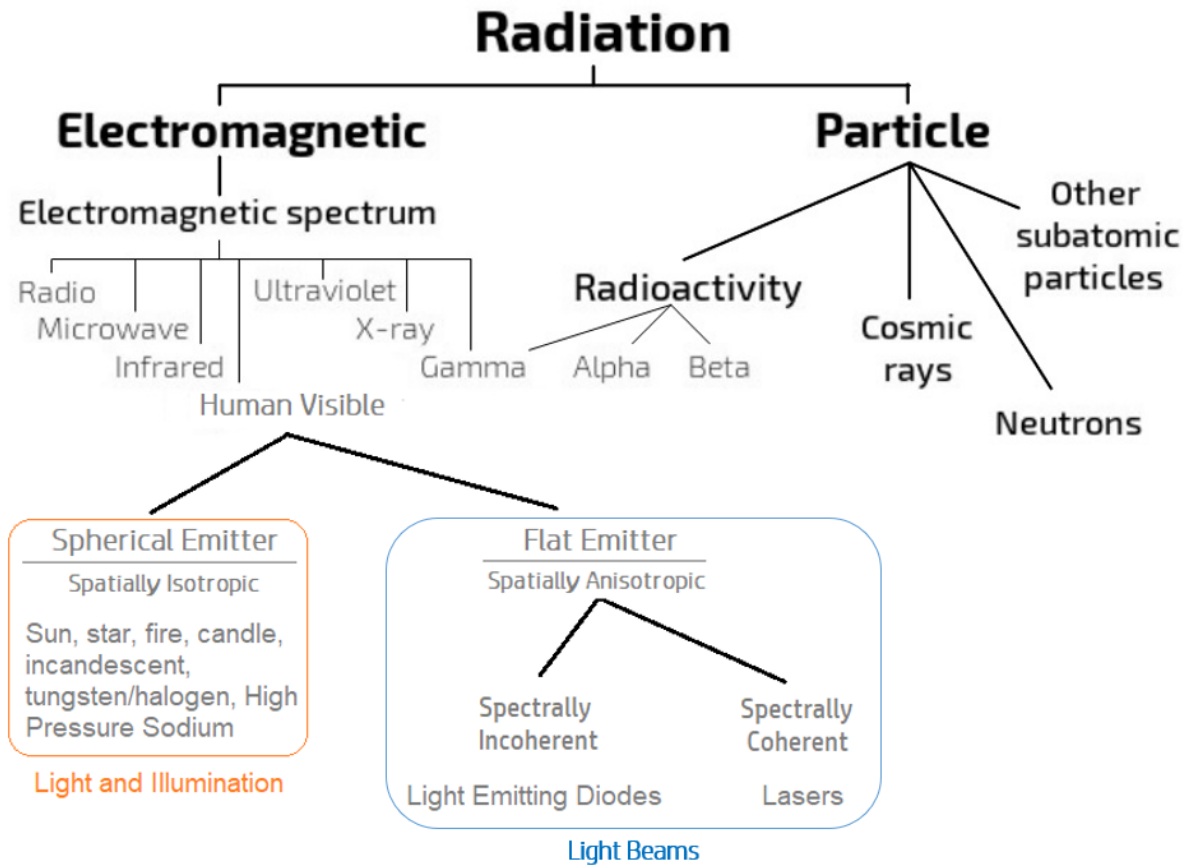
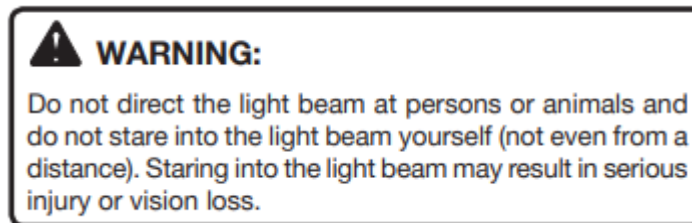


Figure 3 - Radiation Types

As an example of how dangerous LED radiation is, the operator’s manual for the Ryobi P705 Flashlight includes the following: “WARNING: Do not direct the light beam at persons or animals and do not stare into the beam yourself (not even from a distance) Staring into the light beam may result in serious injury or vision loss.”



The warning also refers to children, who along with infants are an identified high-risk population vulnerable to LED-exposure harm. Babies often lack an adult’s automatic, self-protective aversion response to bright or intense light, and will stare directly at the source.

The result of exposure to LED radiation is immediate sickness in the form of headaches, nausea, eye pain, loss of balance, migraines, panic response, altered vision, epileptic seizures, disorientation, and other neurological disturbances. Each of these symptoms is being verifiably reported by an increasing number of individuals and constitute medical evidence of LED-induced harm.

LED streetlights are a misrepresented, unsafe consumer product which is knowingly being installed in public settings by the utility companies. LED visible radiation exposure is causing catastrophic physical harm, subjecting at-risk individuals to illness and injury, and plunging formerly healthy, independent people into crisis levels of stress, hopelessness, psychological trauma, and persistent thoughts of suicide.

We would like to propose the following amendments or changes to the S.7663.

- 1) Change “Shielded” to “Fully Shielded” with a definition of: **Fully shielded** means outdoor light fixtures shielded or constructed so that no light rays are emitted by the installed fixture at angles above 15 degrees below the horizontal plane and also constructed so that the filament or light source is not visible to the naked eye when viewed from a point higher than 15 degrees below the horizontal plane.⁵
- 2) Add: Electronic billboards and signs shall be extinguished between the hours of 11pm and 5am.
- 3) Light Emitting Diode (LED) devices shall be diffused such that the diode is not directly visible.
- 4) Any LED device shall not exceed 300 nits of peak luminance, including electronic billboards and signs.
- 5) Any LED device, excluding billboards and signs, and shall have a maximum peak Correlated Color Temperature of 2200 Kelvin.
- 6) Any LED device shall not produce sub-sensory flicker.

The total number of light emitters is a major issue and has not been addressed, but the total number must be limited. In addition, LED light beams cause epileptic seizures, migraines, and other negative neurological outcomes, so the issue of discrimination from artificial light should be addressed. Finally, there must be a restriction on total amount of light pollution emitted into the natural night resource.

⁵ <https://www.lawinsider.com/dictionary/fully-shielded>

Sincerely,

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