

December 29, 2021

BY EMAIL

Keri Sweet-Zavaglia, General Counsel
National Grid
Keri.Sweet-Zavaglia@nationalgrid.com

Re: The LED Fraud

Dear Keri Sweet-Zavaglia,

We wish to alert National Grid of the fraudulent and deceptive statements being made by National Grid regarding LED radiation devices.

“Compared to traditional high-pressure sodium streetlights, LEDs, or light-emitting diodes, are highly energy-efficient”¹ - This is a fraudulent statement. According to the US Department of Energy’s website, energy efficiency means “using less energy to get the same job done.”² The job 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. LEDs are simply a low quality, toxic, hazardous, and discriminatory type of visible radiation.

The truth is that LEDs emit non-uniform radiation which creates a low-quality light. The center of the beam is extremely intense and does not spread evenly over the angle or steradian to be illuminated. The result of exposure to this type of 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. Because LEDs do not emit uniform light, LED streetlights do not comply with standards such as the Illuminating Engineering Society IES RP-8-18 which was written only for spatially isotropic light sources.

Figure 1 is a diagram showing the difference between uniform radiation from a spherical emitter such as Incandescent and High-Pressure Sodium and non-uniform radiation from a flat surface emitter such as LED.

¹ <https://www.nationalgridus.com/News/2020/12/National-Grid,-City-of-Lackawanna-Complete-LED-Streetlight-Conversion/>

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

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



Spherical Emitter



Flat Surface Emitter

Figure 1 - Spherical vs. Flat Surface Emitter

Figure 2 shows the categorization of radiation and illustrates that *light and illumination* are spatially isotropic radiation in the human visible portion of the electromagnetic spectrum. Radiation emitted by LEDs do meet the regulatory meaning of or comply with standards for the use of light as illumination.

Regulatory Meaning of Light and Illumination

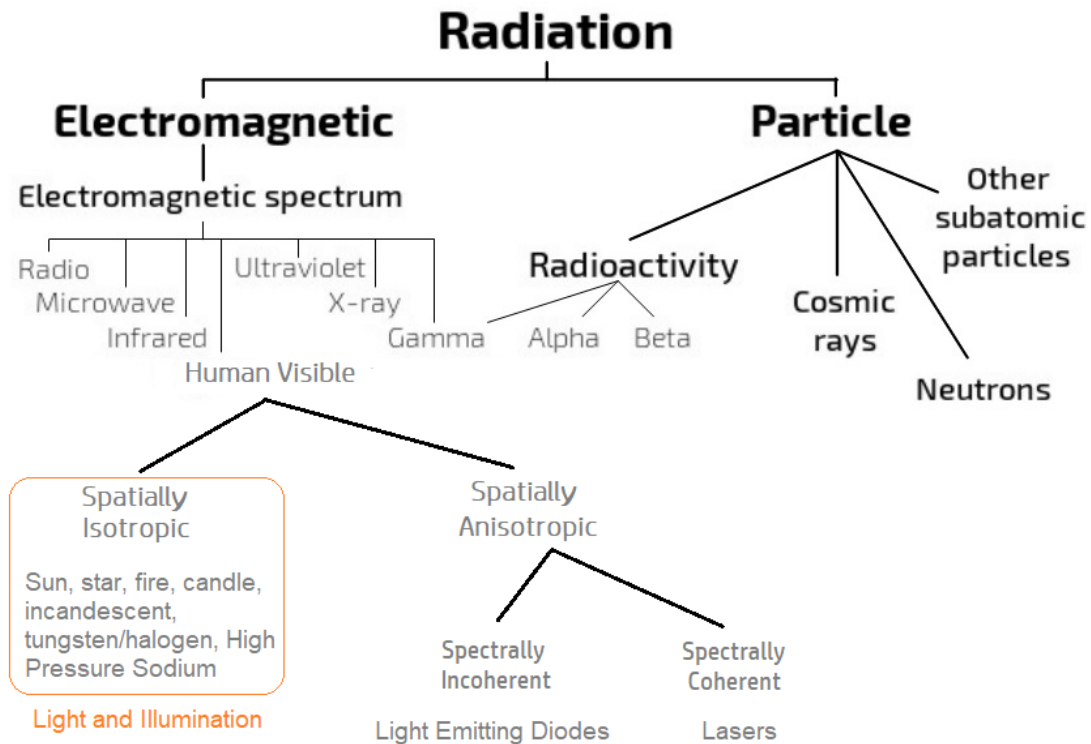


Figure 2 - Radiation Types

“Compared to traditional high-pressure sodium streetlights, LEDs, or light-emitting diodes ...improve visibility,”⁴ - This is misleading. Figure 3 is a promotional photo from National Grid showing both HPS and LED streetlights. As can be seen in the photo, the LED streetlights produce a high contrast glare with non-uniform illumination. This type of light causes the pupil to constrict, thus reducing visibility. The excessive amount of 450nm blue wavelength light increases glare, further reducing visibility, and many people report experiencing visual distortions, phantom array, and an inability to gauge distances to objects or surfaces seen under LED lights. In addition, LED streetlights greatly reduce visibility of stars and therefore a blanket statement of LEDs improving visibility cannot be made.



Figure 3 - National Grid Street Lights⁵

“[The city’s] streetlights were retrofitted as part of National Grid’s Streetlight Conversion Program, which enables communities to switch from more costly high -pressure sodium lights.” - This is a false statement because it states that HPS is “more costly” than LED. This cost comparison cannot be made because the LED visible radiation is nowhere near the quality of HPS illumination and LED radiation is toxic, hazardous, and discriminatory.

“Visually, LEDs produce a distinctly whiter, brighter light compared to the yellow hue cast by traditional high-pressure sodium lights,” - This is a deceptive statement because it is intended to make the reader believe that LED radiation is better than HPS. The visible radiation produced by LEDs,

⁴ <https://www.nationalgridus.com/News/2020/12/National-Grid,-City-of-Lackawanna-Complete-LED-Streetlight-Conversion-/>

⁵ <https://www.nationalgrid.com/stories/grid-work-stories/keeping-your-lights-bright-and-homes-cosy-christmas>

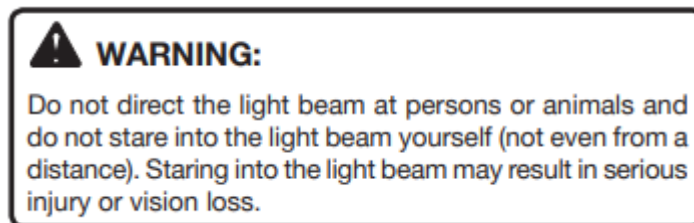
especially those labeled as “white”, 3000K, 4000K or 5000K, are mostly 450nm blue wavelength. The yellow phosphor tricks the eye into not seeing the true blue color of the visible radiation from an LED, but it is misleading to claim that the color is “white”. White is the color of an object when uniform visible radiation from the sun reflects off an object such that all the visible wavelengths are reflected essentially equally. The so-called white from an LED is simply the brain going haywire, not understanding what this spatially anisotropic radiation is.

LED radiation is dangerous and can cause eye injury. As an example, consider this warning shown in Figure 4 from the company Gear Light.



Figure 4 - LED Flashlight

As another example, 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.”



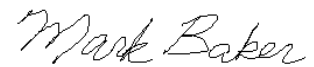
Clearly neither light can be safely used in a dark environment, as there is no feasible way to protect every approaching person or animal from being hit in the eye with the light beam. The Gear Light warning also refers to children, who along with infants are an identified high-risk population vulnerable 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. National Grid is doing nothing to

prevent babies or children from looking straight into LED street lighting from a stroller or car seat, leaving them at risk of irreversible eye damage.

LED streetlights are a misrepresented, unsafe consumer product which National Grid is knowingly installing in public settings. 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.

Due to its use of fraudulent, false, and deceptive statements, National Grid is liable for the injuries, harm, pain, and suffering caused by the installation and operation of LED radiation devices.

Sincerely,

A handwritten signature in black ink that reads "Mark Baker". The signature is written in a cursive style with a large initial "M".

Mark Baker
President
Soft Lights Foundation
www.softlights.org
mbaker@softlights.org
9450 SW Gemini Drive PMB 44671
Beaverton, OR 97008