

March 1, 2022

BY EMAIL

Heather Humphrey, General Counsel
Evergy
heather.humphrey@evergy.com

Re: The LED Fraud

Dear Heather Humphrey,

Evergy shows an example of the non-uniform energy of LED lights on the Evergy website.¹

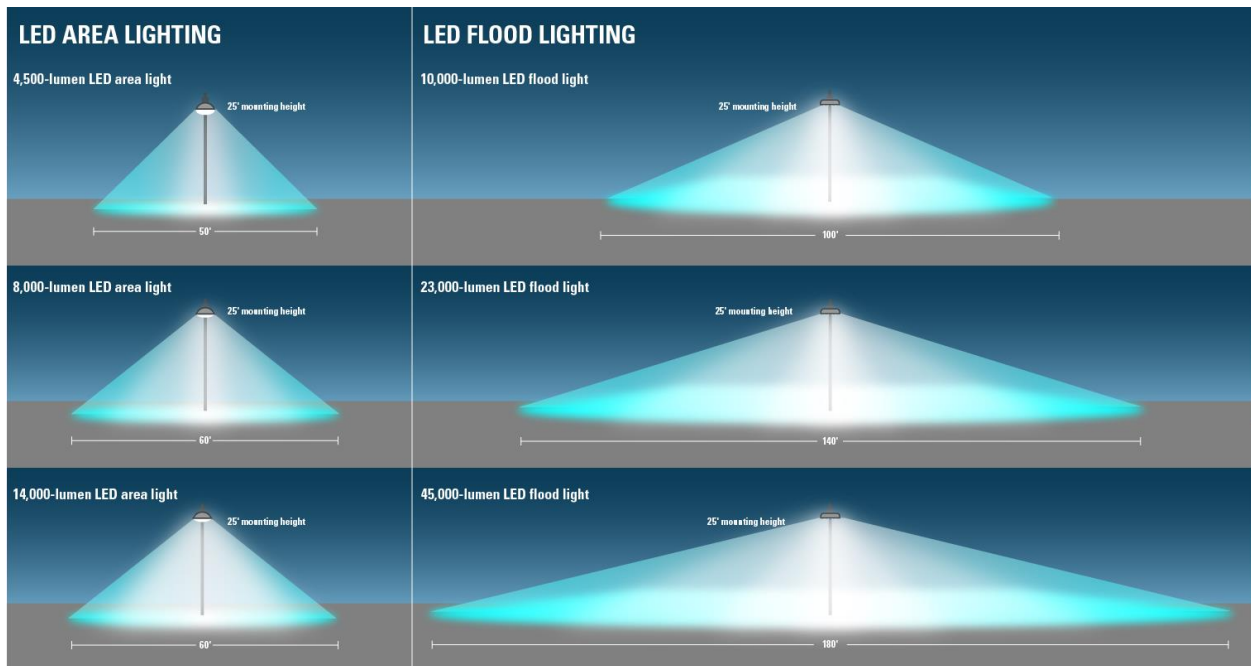


Figure 1 - Non-uniform LED Light

Yet, on the same webpage, Evergy claims, “All efficient LED area lighting options are maintenance free.” Because LED light is non-uniform, the claim that LEDs are energy efficient is false. The purpose of this letter is to address this false claim.

¹ <https://www.evergy.com/ways-to-save/resources-link/equipment/led-flood-and-area-lighting>

Figure 2, Figure 3, and Figure 4 are further examples by Evergy that LEDs save energy and are more energy efficient than previous technologies.

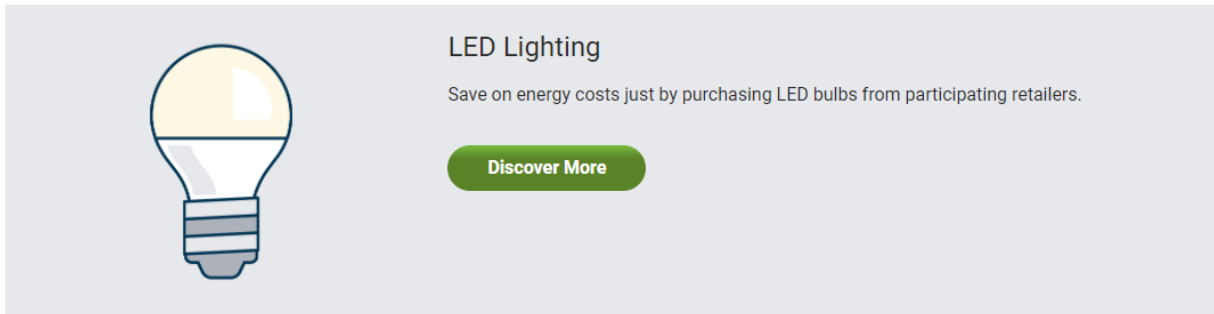


Figure 2 - Evergy Claim of Energy Savings²

Evergy offers a wide range of incentives designed to help our Missouri business customers achieve energy savings by reducing the upfront cost of installations. Our Standard Incentives provide savings for energy-efficient equipment upgrades on a one-for-one basis, making it quick and easy to save money and energy.

Figure 3 - Evergy Claim of Energy Efficiency³

"This is simply a manufacturer's defect. We installed LED street lights a few years ago because they're more energy efficient and because when working correctly, they have a longer lifetime than the older bulbs that have been replaced. So, this really was a move toward more efficient, more modern technology. This is simply a manufacturing defect that's being corrected."

Figure 4 - Evergy Spokesperson Claim of Energy Efficiency⁴

According to the US Department of Energy's website, energy efficiency means "using less energy to get the same job done."⁵ The job is to provide uniform illumination with minimal harm. LEDs do not produce uniform illumination⁶, but rather they emit radiation from a flat surface which creates a bullet-shaped light beam instead of uniform illumination. 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.**

Figure 5 is a false claim by Evergy that turning on lights reduces or eliminates crime. As per numerous studies, artificial light does nothing to reduce crime.⁷

² <https://www.evergy.com/ways-to-save/discounts>

³ <https://www.evergy.com/-/media/documents/ways-to-save/incentives/evergy-standard-incentives-brochure.pdf?la=en>

⁴ <https://www.kwch.com/2021/06/01/evergy-manufacturer-will-replace-defective-street-lights-turning-purple/>

⁵ https://www.energystar.gov/about/about_energy_efficiency

⁶ <https://ieeexplore.ieee.org/document/8879542>

⁷ <http://www.softlights.org/crime-and-safety/>

To help you turn lights on and crime off, we offer dusk-to-dawn leased lighting options for your home or work in a variety of fixtures and applications for backyards, parking lots, loading docks, farm lots and more.

Figure 5 – Every claim that artificial light eliminates crime.

Spherical vs. Flat Surface Emitters

There are now two types of light in the world: point sources and flat surface sources.

Point sources are the types of light that we have evolved with, such as the sun, incandescent, and even High-Pressure Sodium. We measure the brightness of such light with the metric luminous intensity.

Flat surface sources are a new invention that has never before been seen in this world. Flat surface sources include LEDs and lasers. The non-curved flat surface emits non-uniform energy that cannot be considered a point source. The brightness of flat surface light is measured using the metric luminance. Flat surface light is toxic, hazardous, discriminatory, and unregulated.

Figure 6 is a slide highlighting the differences between the two types of light.

Brightness and linearity of human vision

- **Brightness: lack of standardized scientific definition**
 - Brightness is an attribute of visual perception and is frequently used as synonym for luminance and (incorrectly) for the radiometric term radiance
- **For point source,**
 - Brightness (in the photopic vision regime) can be approximated by the luminous intensity (cd)
- **For surface source,**
 - Brightness can be approximated by luminance (cd/m²)
- **Standard CIE**
 - Assumption: human vision is linear within the photopic regime
 - Isotropically emitting blue point source and red point source have the same luminous intensity

445.664 (Intro. LED) / Euijoon Yoon

Figure 6 – Brightness of Two Source Types⁸

⁸ Seoul National University - <https://ocw.snu.ac.kr/sites/default/files/NOTE/791.pdf>

Every's diagram in Figure 1 matches the diagram from the Soft Lights Foundation diagram shown in Figure 8.

LED light is not just regular light. The difference between regular light and LED light is that regular light comes from a spherical emitter, while LED light comes from a flat surface emitter. The differences between a point source and flat surface source are obviously understood by Every leadership and staff due to the posting of the diagram in Figure 1, but then Every is falsely claiming that LEDs are more energy efficient than HPS.

The left side of Figure 7 shows light from a point source. The light is uniformly spread and follows the well-known Inverse Square Law.⁹

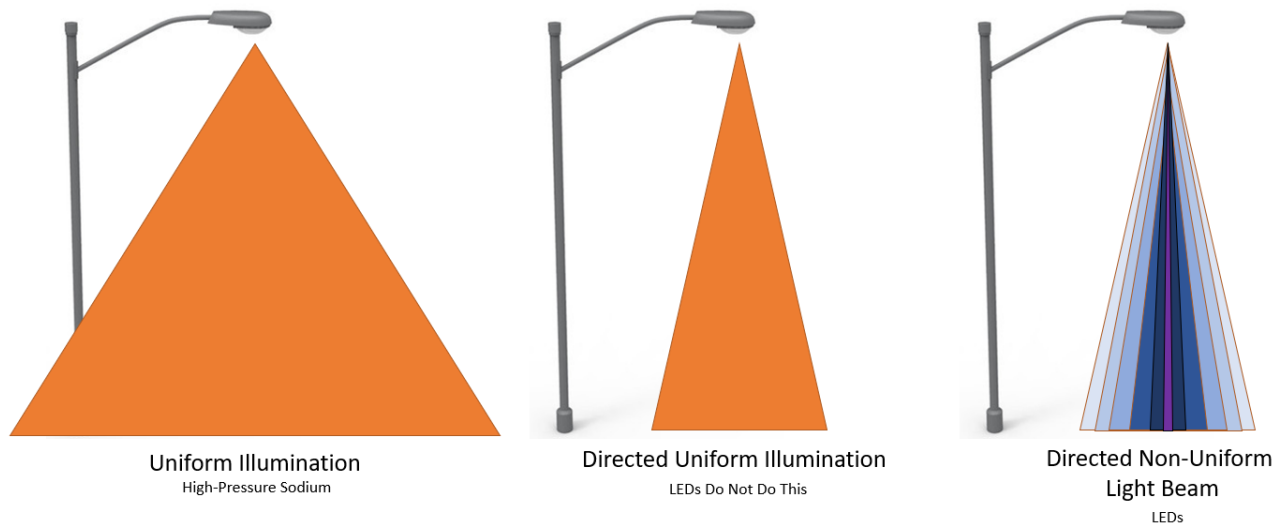


Figure 7 - Streetlight Comparison

Flat surface sources do not emit uniform light. Flat surface sources emit directed light beams, but those light beams are not uniform. The middle image in Figure 7 is **not** LED light, as noted also by Every.

The true shape of light from a flat surface is shown on the right in Figure 7. The energy is non-uniform, with the light beam being extremely dense in the center of the chip, and much less dense on the edges.¹⁰ This non-uniform light from the tiny source interferes with human nerve signaling because human nerves were only designed to receive signals that arrive with uniform energy.

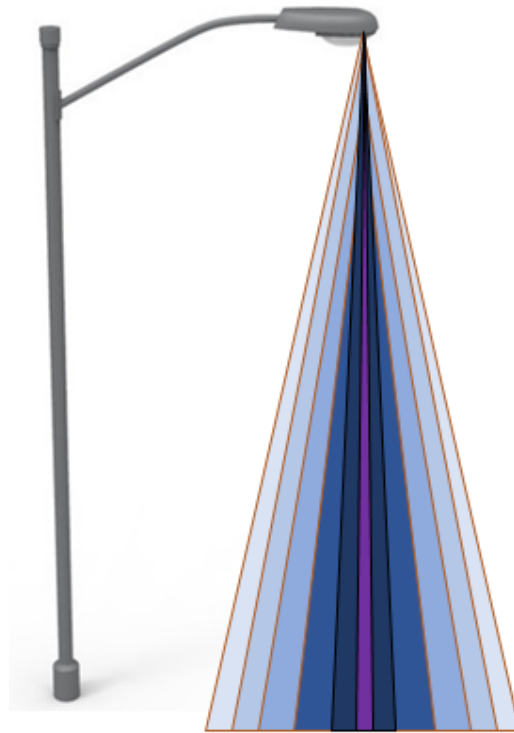
Streetlights

Figure 8 highlights the issue of flat surface sources such as LEDs. The non-curved surface of an LED chip causes the emitted light beams to overlap, with the middle of the chip having an extremely dense light, and the edges of chip being much less dense. This creates a non-uniform spatial shape of light which is unfit for the purpose of illumination. Figure 8 shows that the beam directly below the

⁹ https://en.wikipedia.org/wiki/Inverse-square_law

¹⁰ <https://ieeexplore.ieee.org/document/8879542>

streetlight will be blindingly bright, while the edges will have insufficient light. This type of light is unsafe and unfit for human vision.



Directed Non-Uniform Light Beam LEDs

Figure 8 - Directed Non-Uniform Light Beam

None of the streetlight standards such as the Illuminating Engineering Society IES RP-8-18 Roadway and Parking Lot lighting are applicable to LED light beams. IES RP-8-18 is only applicable to point sources. While IES falsely claims that LEDs are point sources, Evergy clearly knows that this is not true. LED streetlights do not comply with any standards, and this is a major safety and liability issue for Evergy. Given that Evergy understands that LED light is non-uniform, we do not understand how Evergy can claim compliance with any existing roadway lighting standard that was written for uniform, point source light.

Figure 9 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

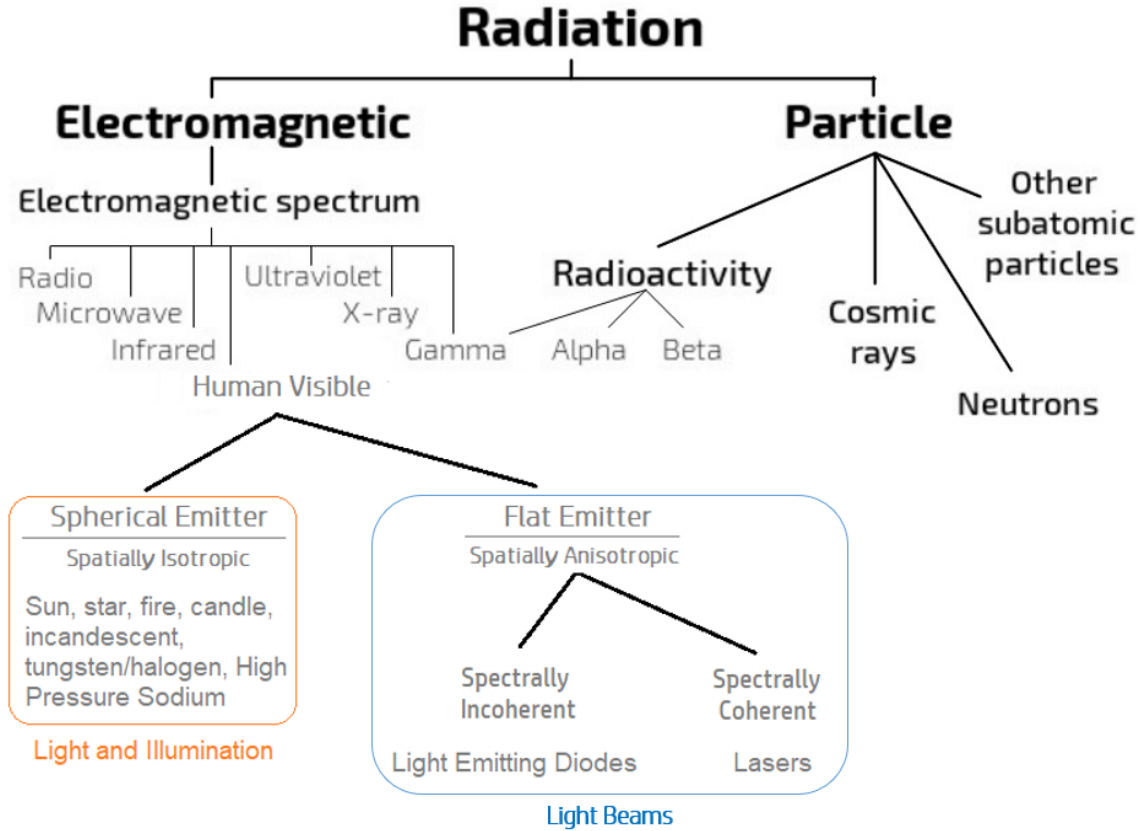


Figure 9 - Radiation Types

Eye Damage

LED light beams are dangerous for human eyes. For 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.” LED streetlights are even more powerful than a handheld flashlight, but where is the warning label for babies in strollers looking up directly into an LED light beam?

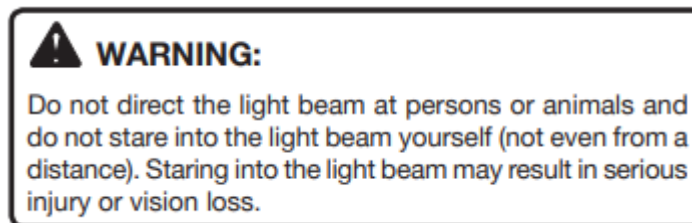


Figure 10 - Flashing Warning

Discrimination

One of the most tragic outcomes of using LED light beams is its effects on those who are LED-sensitive. This includes people with epilepsy, autism, migraines, PTSD, and other neurological conditions where the non-uniform energies of the LED light beams cause the nerves to overload and short circuit, resulting in epileptic seizures, migraines, panic attacks, anxiety, and agitation. Some of these heart-wrenching stories of how the widespread installation of LEDs have destroyed lives are posted on our website.¹¹ LED lights are discriminatory because they interfere with a person's major life functions such as seeing, thinking, and concentrating. Here are a few quotes:

- **Epilepsy:** *I have epilepsy, and even the briefest glimpse of an LED light instantly throws me into a seizure."*
- **Migraines:** *The most distressing symptom from these [LEDs] is a burning sensation in the occipital area of my brain.*
- **Autism:** *I was crawling around on the ground, pulling the grass, pulling my hair, screaming.*
- **Lupus:** *I developed a sunburn-type rash to my face, neck, and chest with spontaneous bleeding to my lip.*
- **Irlen's Syndrome:** *Walking in the dark is horrendous because of these lights.*
- **Sjogren's Syndrome:** *Strobing LED lights are becoming so common on utility vehicles, and they cause me to go into a completely overloaded state where I can't think straight.*

Given that Evergy understands that LED light is non-uniform and given that non-uniform flat surface light is toxic and discriminatory, Evergy must take the following actions.

- 1) Evergy must fully disclose that LED streetlights do not emit uniform light, and that LEDs do not save energy because they do not provide the same uniform illumination service as HPS.
- 2) Evergy must fully disclose the dangers of LED lights, including its impacts on those with epilepsy, migraines, autism, and PTSD.
- 3) Evergy must provide to cities an analysis of replacing 100-watt HPS with 50-watt HPS as an alternative to LED.
- 4) Evergy must notify the Federal Trade Commission of its false claims of energy efficiency and remove those false claims from its marketing materials.
- 5) Evergy must remove the toxic LED streetlights to protect human health and safety.

¹¹ <http://www.softlights.org/stories/>

Sincerely,

Mark Baker

Mark Baker
President

Soft Lights Foundation
mbaker@softlights.org

**YOU DON'T HAVE THE RIGHT
TO SHINE YOUR  LIGHT
IN MY **