



February 24, 2022

**BY EMAIL**

Deneen Donnley, General Counsel  
Consolidated Edison  
donnleyd@coned.com

**Re: The LED Fraud**

Dear Deneen Donnley,

We are contacting you about ConEd's deceitful and fraudulent claims regarding the supposed energy efficiency of LED light bulbs. Figure 1 shows the ConEd Claims.<sup>1</sup>

- **Energy Efficiency** While a standard bulb costs about \$7 a year to power, LED bulbs will run you just \$1.
- **Color and Appearance** LEDs are available in a wide range of natural light colors that illuminate any space or product display beautifully.
- **Optimized Energy Use** 90% of the electricity used by standard bulbs produces heat, while only 10% produces light. LEDs keep their cool and utilize electricity for light output (lumens) exclusively. They provide the same level of brightness as standard bulbs while consuming far less energy (watts).

*Figure 1 - ConEd Claims*

According to the US Department of Energy's website, energy efficiency means "using less energy to get the same job done."<sup>2</sup> The job is to provide uniform illumination with minimal harm. LEDs do not produce uniform illumination<sup>3</sup>, 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.**

We will address each of Consolidated Edison's deceitful and/or fraudulent claims here.

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<sup>1</sup> <https://www.coned.com/en/save-money/rebates-incentives-tax-credits/rebates-incentives-tax-credits-for-commercial-industrial-buildings-customers/instant-lighting-incentive-program>

<sup>2</sup> [https://www.energystar.gov/about/about\\_energy\\_efficiency](https://www.energystar.gov/about/about_energy_efficiency)

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

**Claim 1: “Energy Efficiency** While a standard bulb costs about \$7 a year to power, LED bulbs will run you just \$1” – While it may be true that an incandescent bulb costs about \$7/year to power, it is impossible to compare an incandescent bulb to an LED to determine if there is a cost savings because the light from a flat surface LED is entirely different than light from a spherical emitter incandescent. As noted above, to claim energy efficiency, the new technology must provide the same service as the previous technology, using less energy. LEDs do not provide the same service as incandescent.

What does it mean to state that “while a standard bulb costs about \$7 a year to power, LED bulbs will run you just \$1”? If Consolidated Edison is using only luminous efficacy for its comparison, then Consolidated Edison is fraudulently claiming that LEDs produce uniform illumination using less energy. LEDs emit light from a flat surface, resulting in a highly directed beam with non-uniform spatial energy that is toxic, hazardous, and discriminatory.

**Claim 2: “Color and Appearance** LEDs are available in a wide range of natural light colors that illuminate any space or product display beautifully.” – LEDs do not produce natural light colors. Nothing about LEDs is natural. The spectral power distribution of LEDs shows a large spike of blue wavelength light and almost no cyan. This is not a natural light color.

LEDs are entirely inappropriate for illuminating a volume of space because the light is not uniform. Humans are adapted to uniform light reflecting from surfaces to detect object shape and color. The bullet-shaped beam of light from an LED does not uniformly illuminate and is not at all a beautiful light, as LED light causes epileptic seizures, migraines, panic attacks and other negative neurological reactions.

**Claim 3: “Optimized Energy Use** 90% of the electricity used by standard bulbs produces heat, while only 10% produces light. LEDs keep their cool and utilize electricity for light output (lumens) exclusively. They provide the same level of brightness as standard bulbs while consuming far less energy (watts).” – The brightness of emitted light is the measured luminance.<sup>4</sup> First, the luminance from an LED is non-uniform, so a single value is not sufficient. If we consider peak luminance, LEDs have an exceedingly high peak luminance, far greater than the luminance of an incandescent. The statement that LEDs “provide the same level of brightness” is false since LED do not emit uniform luminance. The excessive peak luminance from an LED will cause thermal and chemical eye damage, and the non-uniform energy interferes with the human nervous system.

## Spherical vs. Flat Surface Emitters

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 spherical emitter and flat surface emitter must be understood by all Consolidated Energy leadership and staff.

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<sup>4</sup> <https://sensing.konicaminolta.us/us/blog/luminance-vs-illuminance/>

The left side of Figure 2 shows light from a spherical emitter. The light is uniformly spread and follows the well-known Inverse Square Law.<sup>5</sup>



Figure 2 - Streetlight Comparison

Flat surface emitters do not emit uniform light. Flat surface emitters emit directed light beams, but those light beams are not uniform. The middle image in Figure 2 is **not** LED light, as claimed by Consolidated Edison.

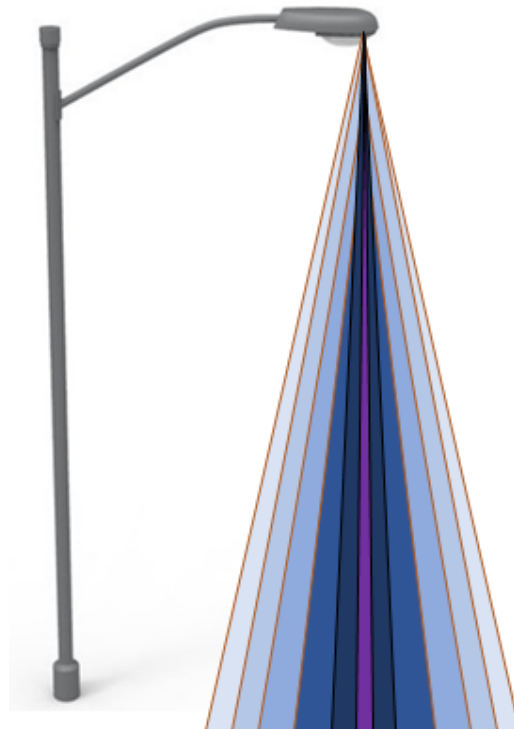
The true shape of light from a flat surface is shown on the right in Figure 2. The energy is non-uniform, with the light beam being extremely dense in the center of the chip, and much less dense on the edges.<sup>6</sup> This non-uniform light from the tiny source interferes with human nerve signaling because human nerves were only designed to receive signals that arrive with uniform energy.

## Streetlights

Figure 3 highlights the issue of flat surface emitters 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 3 shows that the beam directly below the streetlight will be blindingly bright, while the edges will have insufficient light. This type of light is unsafe and unfit for human vision.

<sup>5</sup> [https://en.wikipedia.org/wiki/Inverse-square\\_law](https://en.wikipedia.org/wiki/Inverse-square_law)

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



### Directed Non-Uniform Light Beam LEDs

*Figure 3 - 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 spherical emitters. LED streetlights do not comply with any standards, and this is a major safety and liability issue for Consolidated Edison.

Figure 4 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

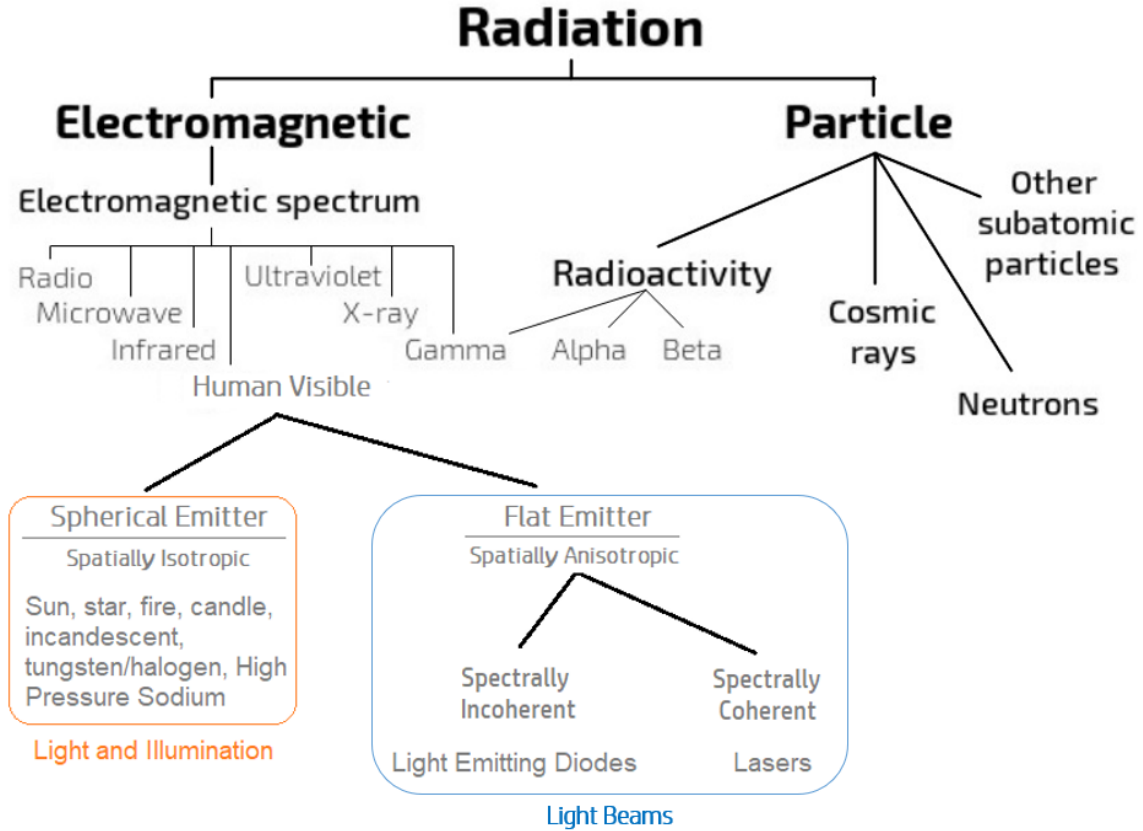


Figure 4 - Radiation Types

### 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?

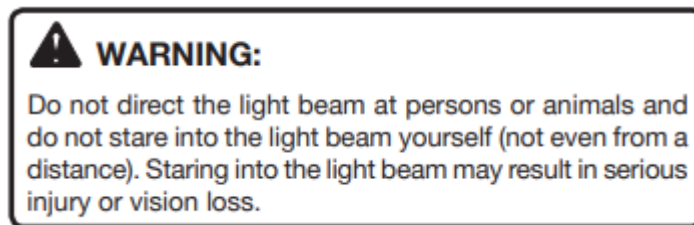


Figure 5 - Flashing Warning

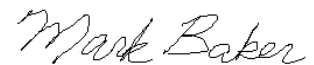
## Discrimination

One of the most tragic outcomes of using LED light beams is its effects on those who are LED-reactive. 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.<sup>7</sup> 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.*

To reduce liability, Consolidated Edison must remove the deceitful and fraudulent claims related to the energy efficiency of LED lights and notify government officials and the public that Consolidated Edison's claim that LED lights are more energy efficient than spherical emitter light sources cannot be made.

Sincerely,



Mark Baker  
President

Soft Lights Foundation  
[mbaker@softlights.org](mailto:mbaker@softlights.org)

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<sup>7</sup> <http://www.softlights.org/stories/>