

January 12, 2022

BY EMAIL

Lina Khan, Chair
Federal Trade Commission
lkhan@ftc.gov

Re: The LED Fraud

Dear Lina Khan,

“LEDs save energy” and “LEDs are energy efficient” are fraudulent claims made by the LED Cartel.

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 electromagnetic radiation is safe. 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 produce uniform illumination⁴, but rather they emit electromagnetic 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

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

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

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 electromagnetic radiation.

Light Emitting Diodes produce light beams, rather than spatially uniform light. The result of the emission from the flat surface of an LED chip is an exceedingly intense beam from the middle of the chip that exceeds human tolerance levels and is toxic, hazardous, and discriminatory. This spatially non-uniform electromagnetic radiation from LEDs is unregulated and not approved by the government.

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.

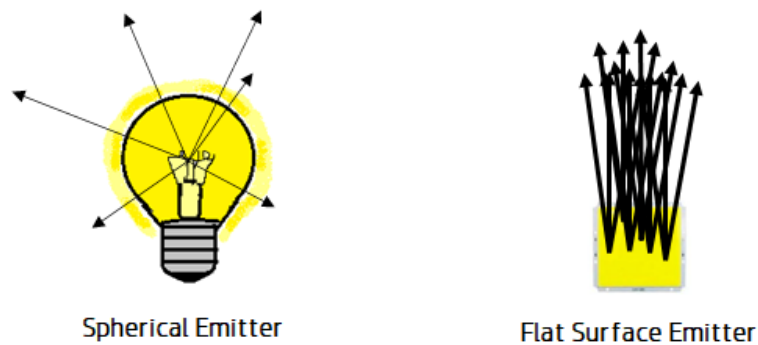


Figure 1 - Spherical vs. Flat Surface Emitter

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

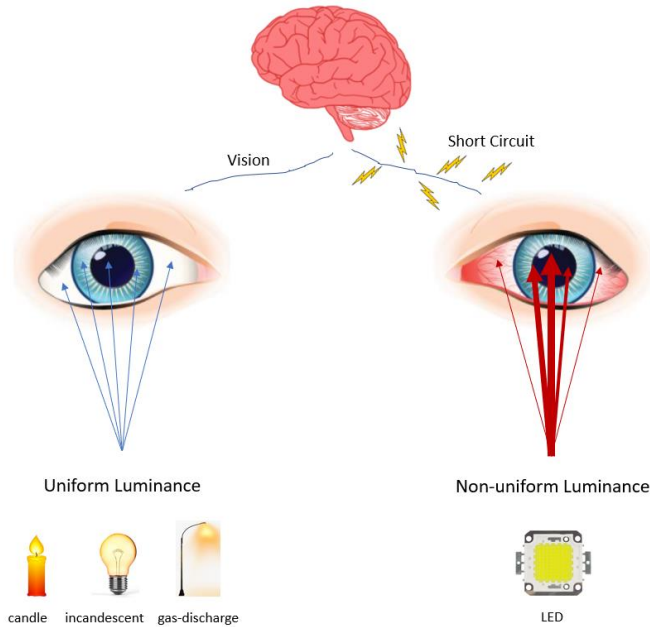


Figure 2 - Spatially Uniform v. Non-Uniform Radiation

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 meet the regulatory meaning of or comply with standards for the use of light as illumination.

Regulatory Meaning of Light and Illumination

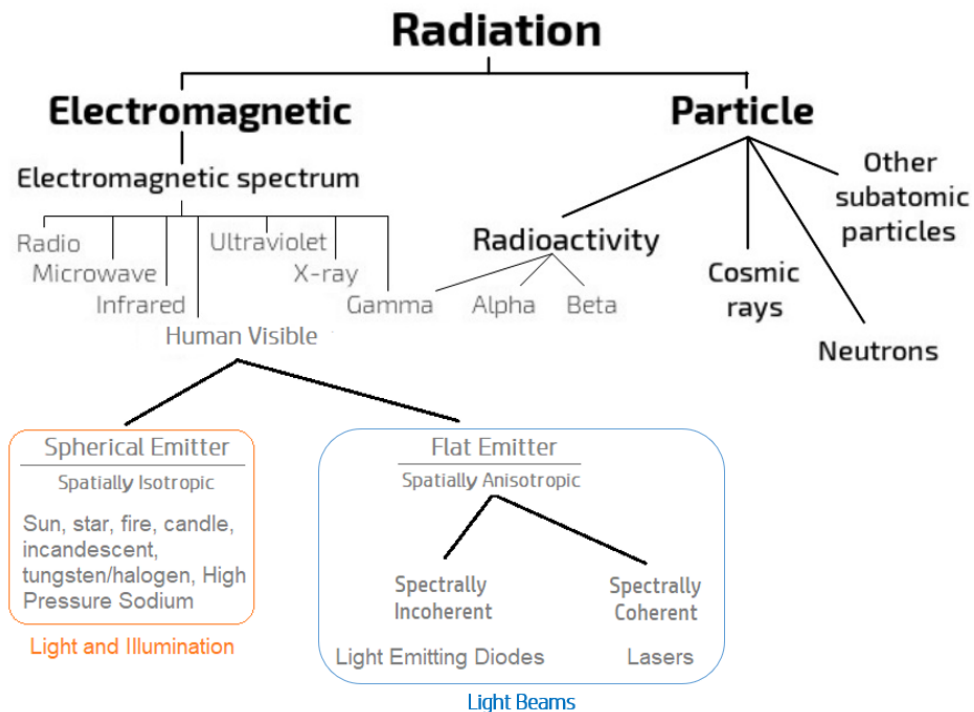
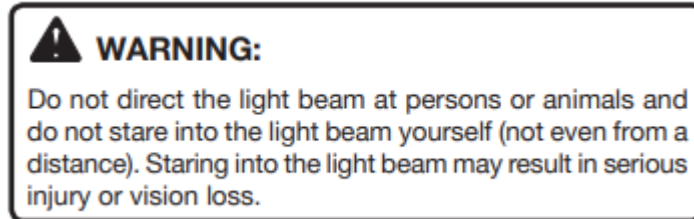


Figure 3 - Radiation Types

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 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.

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. Use of LED radiation devices violates the federal Americans with Disabilities Act.

Below are three of the many utility companies across that USA that are making false, deceptive, and fraudulent statements about LED light beams.

Pacific Gas and Electric

Figure 4 is a quote from Pacific Gas and Electric.⁵ There are two fraudulent statements in the heading and text.

⁵ https://www.pge.com/en_US/residential/save-energy-money/savings-programs/led-lighting/led-lighting.page

Get better quality light and use less energy

Make a difference for the environment and your wallet every time you turn on a light. Use LED bulbs to save money and improve the quality of light in your home. You also help the environment as LED bulbs use 75 percent less energy than incandescent bulbs.

Figure 4 - Pacific Gas and Electric Fraudulent Claim

- *“Better quality light”* – Humans are biologically designed to process spatially uniform electromagnetic radiation in the human-visible portion of the spectrum. Humans have never in history had been exposed to electromagnetic radiation from a flat surface emitter. Humans are not biologically equipped to process spatially non-uniform electromagnetic energies. LED light beams interfere with human nerves, leading to seizures, migraines, psychological trauma, and other negative neurological consequences. LED light beams are not a “better quality light” since LEDs cause so much injury.
- *“Use less energy”* – As stated earlier, for a new technology to qualify as “using less energy”, the new technology must get the same job done. The job is to provide uniform illumination. An LED, on the other hand, is a directed light beam, not fit for the purpose of providing uniform illumination. **An energy efficiency comparison between an incandescent light bulb and an LED light beam cannot be made, and thus the claim “uses less energy” is fraudulent.**

Figure 5 highlights the fraudulent claims. A uniform illumination device that is compatible with the human nervous system is shown on the left side of the diagram.

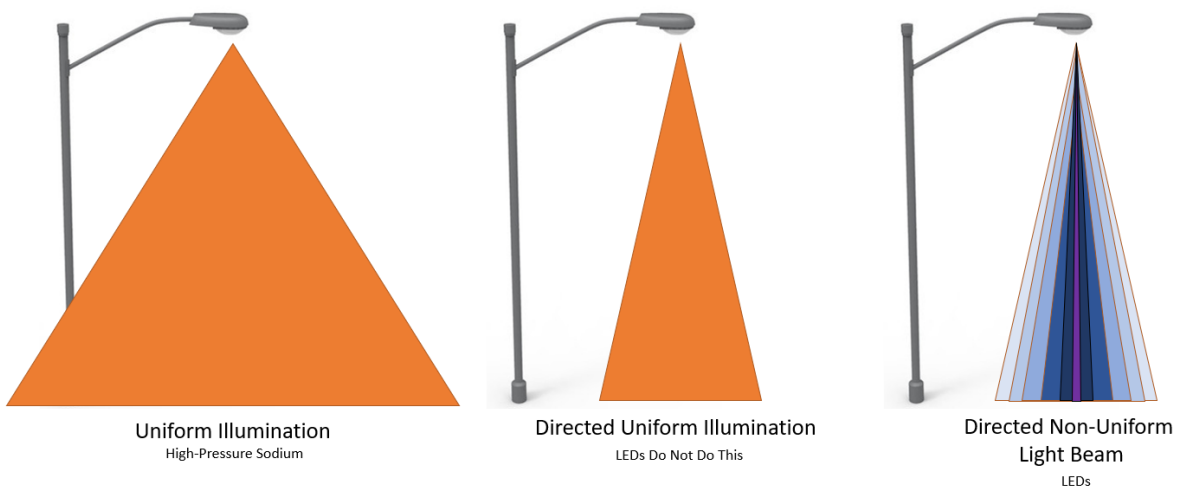
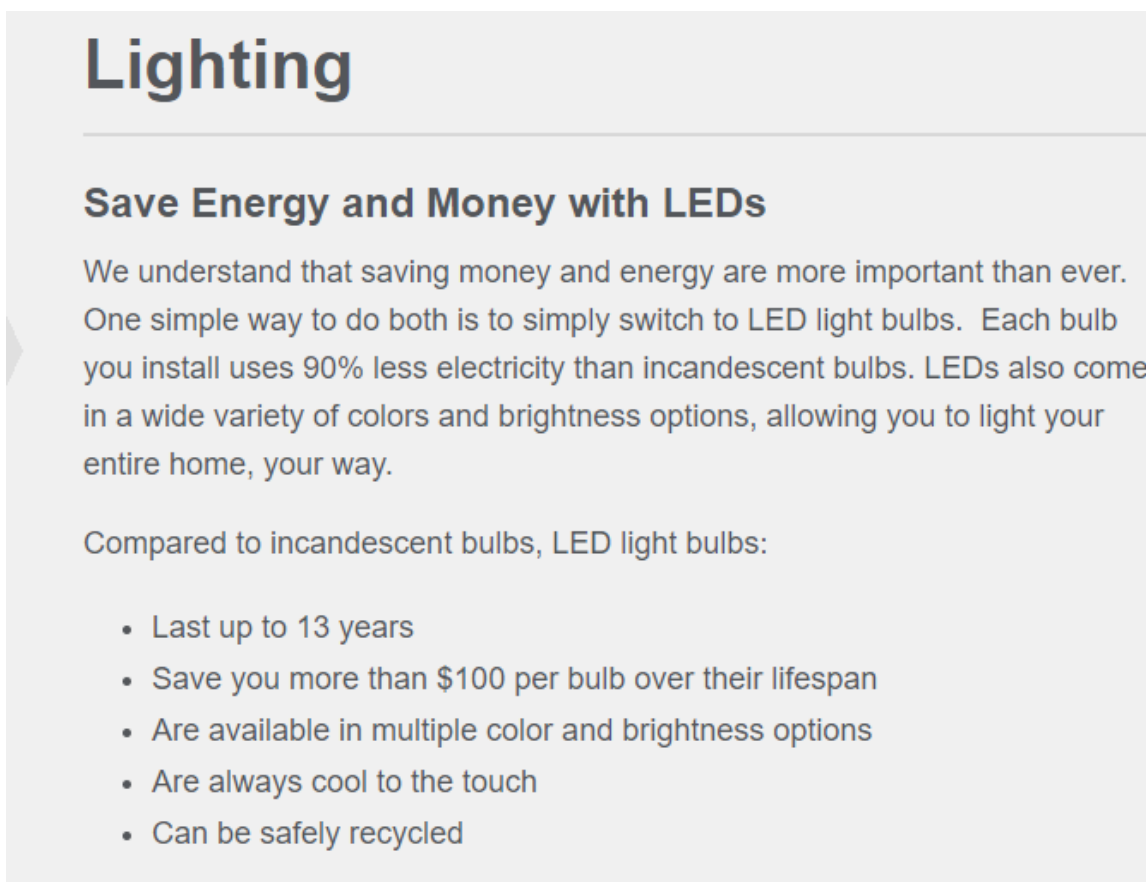


Figure 5 - Streetlight Comparison

In the middle portion of Figure 5 is what Pacific Gas and Electric fraudulently claims is the shape of the LED light beam. PG&E claims that the beam is directed, but uniform, therefore saving energy. The reason this claim is fraudulent is because PG&E knows that this middle diagram is not a truthful representation of the actual shape of the LED light beam. The real pattern of an LED light beam is shown on the right side of the figure which demonstrates the non-uniformity of the light and showing that the middle of the light beam is exceedingly intense, far beyond human tolerance levels.

National Grid

Figure 6 is a quote from National Grid.⁶ Contrary to National Grid's fraudulent claims, LED light beam devices do not save energy and they do not save money. We would also hope that the FTC would prohibit National Grid from using a phrase such as "Last up to 13 years" which deceives the consumer and provides no useful information.



The image is a screenshot of a webpage section titled "Lighting". Below the title is a sub-header "Save Energy and Money with LEDs". The main text reads: "We understand that saving money and energy are more important than ever. One simple way to do both is to simply switch to LED light bulbs. Each bulb you install uses 90% less electricity than incandescent bulbs. LEDs also come in a wide variety of colors and brightness options, allowing you to light your entire home, your way." Below this is a section titled "Compared to incandescent bulbs, LED light bulbs:" followed by a bulleted list of five points: "Last up to 13 years", "Save you more than \$100 per bulb over their lifespan", "Are available in multiple color and brightness options", "Are always cool to the touch", and "Can be safely recycled".

Lighting

Save Energy and Money with LEDs

We understand that saving money and energy are more important than ever. One simple way to do both is to simply switch to LED light bulbs. Each bulb you install uses 90% less electricity than incandescent bulbs. LEDs also come in a wide variety of colors and brightness options, allowing you to light your entire home, your way.

Compared to incandescent bulbs, LED light bulbs:

- Last up to 13 years
- Save you more than \$100 per bulb over their lifespan
- Are available in multiple color and brightness options
- Are always cool to the touch
- Can be safely recycled

Figure 6 - National Grid Fraudulent Claim

⁶ <https://www.nationalgridus.com/Upstate-NY-Home/Energy-Saving-Programs/Lighting>

Duke Energy

Figure 7 is a quote from Duke Energy.⁷ LED light beam devices do not provide health benefits; they are toxic and discriminatory. LEDs are not energy efficient; they simply create a non-uniform light beam that is hazardous. LEDs do not use less energy, they just use a certain amount of energy and that amount cannot be compared to a High-Pressure Sodium device that emits spatially uniform electromagnetic radiation.

In addition to health benefits, LEDs are more efficient, using less energy and resulting in lower energy bills.

Figure 7 - Duke Energy Fraudulent Claims

We wish to assure the FTC that the fraudulent claims of saving energy by these utility companies are not simple errors of loose use of the English language. These false claims are purposely fraudulent, with the goal of selling billions of dollars of products and services. Just as the claim “saves energy” between an incandescent cannot be made between an incandescent and a laser beam, that same claim cannot be made between an incandescent and an LED light beam.

We request that the FTC hold these utilities companies accountable for their fraudulent statements, require that these companies remove the false claims from their marketing materials, reimburse customers who have purchased these LED light beam devices, and financially penalize these companies for the fraud.

Sincerely,



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⁷ <https://illumination.duke-energy.com/articles/how-led-lights-can-help-you-feel-better>