

25 LIGHTING INDUSTRY TRENDS FOR 2025

Whitepaper by David Shiller, Editor

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2025



Executive Summary:

Lighting industry innovation and market changes are increasingly being driven by forces outside of the lighting industry. Examples include a global treaty to ban mercury containing lamps, electrification to combat climate change, and continuous breakthroughs in novel materials. It's hard to deny that the lighting industry is getting pushed, pulled, and shoved, in a variety of directions. Throughout this document are links to stories that further explain or illustrate the linked topic. This white paper is a guide to help with business planning for 2025.

1.

LED UBIQUITY.

[LED socket saturation](#) is now being driven by [mercury lamp bans](#) for commercial and industrial sectors, as well as US DOE General Service Lamps (GSL) standards for residential applications. [These regulations](#) increase residential-type lamp efficacy requirements to 83-195 lpW.

[Fluorescent lamp bans are accelerating commercial LED retrofits in 10 states](#), with more states likely to adopt bans. A US national mercury lamp ban seems increasingly likely by 2027 in order for the US to comply with the Minamata Convention on Mercury. [Canada has already banned both fluorescent and HID lamps](#), with a variety of effective dates over the next four years.

Some utilities in CA & MA are ending commercial lighting rebates, due to the high LED install base, and reduced ability to claim energy savings. [Other utilities are increasingly offering year-end rebate bonuses](#) to get more projects. Only LED is expected to meet these requirements, which become effective in the next three years.





Credit: rawpixel.com

2. ELECTRIFICATION.

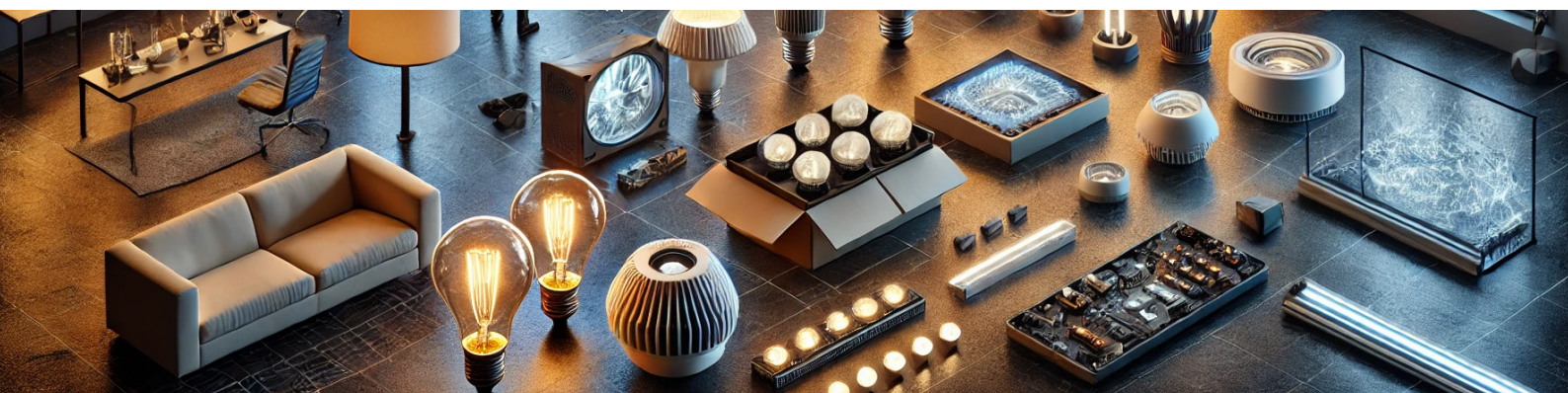
Impacts of the push toward electrification include rising [electricity rates](#), regulations like [building performance standards](#), tightening building [energy codes](#), government & utility [incentives](#) for electrification, and [increasing ROI](#) for legacy lighting retrofits. [EV chargers](#) and other renewable energy products are increasingly manufactured and sold by lighting manufacturers.

Strains on the electric grid will require greater building to grid communication. ISO 15118 is an important standard that defines an EV to grid communication interface through an EV charger, and it can even send energy from EVs back to the grid. [ISO 15118](#) is a requirement for EV chargers in New York state, as well as many European countries. Watch for more states adopting ISO 15118 requirements.

3. SSL TECHNOLOGY TRENDS.

LED lighting products are evolving in a myriad of different directions:

- Increasing availability of hardwired, emergency [TLEDs that meet UL 924](#). NaturaLED, LEDVANCE, and Keystone are three examples of companies now offering these UL924-listed emergency TLEDs.
- High output [filament lamps](#) are increasingly replacing HID lamps, as well as corn cobs.
- 8' TLEDs that ship as two 4' sections, to eliminate breakage.
- Increasing use of [non-isolated drivers](#) due to their lower cost and higher efficacy.
- Growth of [cordless, rechargeable](#) table and floor lamps, for both indoors and outdoors.
- Increasing use of LEDs + water vapor to simulate fire, more safely. Examples include the [Paris Olympic cauldron](#), and [fireplace inserts](#).
- Miniaturization, [micro-optics](#), and [micro-luminaires](#) that can be magnetically attached to tracks.
- LED ultra-narrow beam angles down to [3 degrees](#).
- Growth in [modular downlights](#).
- The growing use of [laser projectors](#) for architectural lighting.
- Increasing use of [LED video walls](#).





4. SIMPLE OR NLC CONTROLS.

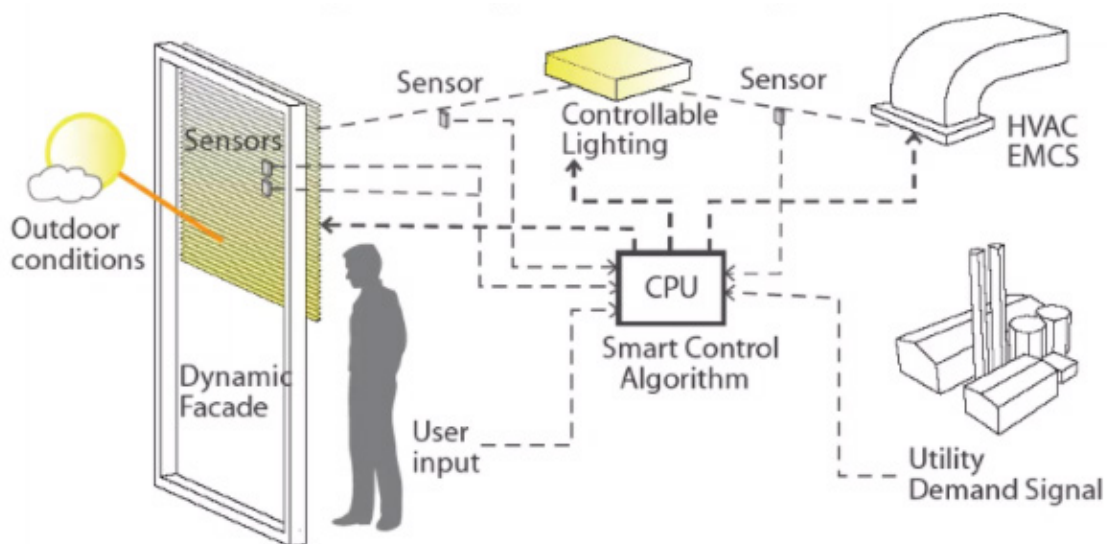
Lighting controls have bi-furcated into very simple plug-n-play sensors that create luminaire-level lighting controls (LLLC), or [networked lighting control](#) systems (NLC) that are feature rich and app-controlled. A good example of simple lighting control is the Z10 connector, a Zhaga Book 18, twist & lock connector that is increasingly being used for easy plug-in motion sensors, for both indoor & outdoor commercial luminaires. Sensor-ready luminaires can be purchased with just the receptacle, allowing sensors to be added in a later project.

NLC continue to evolve. There is growth in [wireless mesh NLCs](#), and a significant decline in required [gateways](#).

5. ADDITIONAL NETWORKED LIGHTING CONTROL (NLC) BENEFITS.

Both energy and non-energy benefits of NLCs continue to expand.

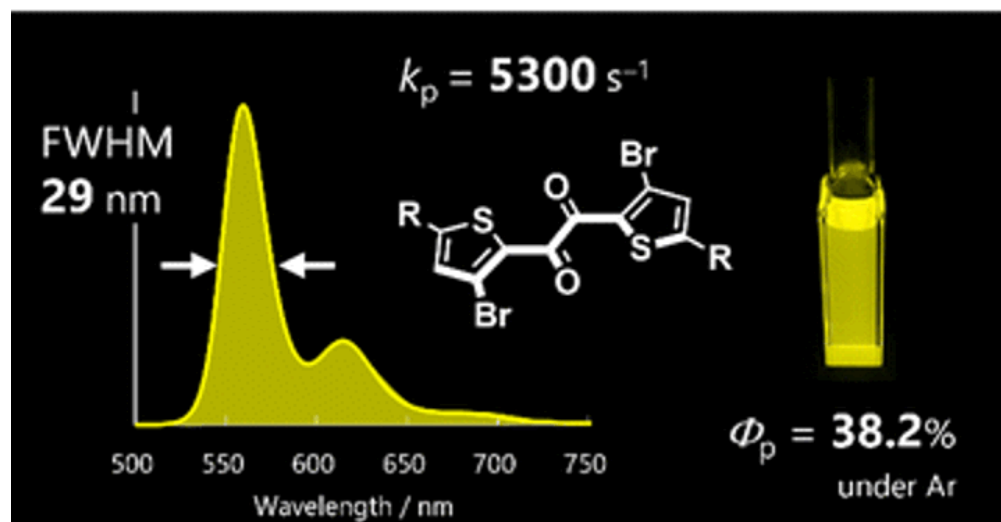
- [NLC-HVAC integration](#) has enormous new potential to save significant HVAC energy.
- NLC can also aid with [demand response](#).
- A recent [Bluetooth NLC standard](#) is improving interoperability.



6. NOVEL MATERIALS.

Advances in novel materials are improving sustainability and performance:

- Research progress on [downconverters](#) that don't use rare earth metals.
- Fungus [mycelium shades](#) that look like concrete.
- [Alternative leathers](#) are becoming commercially available.
- New research has created [metamaterials](#) more transparent than glass.
- [Translucent concrete](#) was originally made using optical fibers, but newer formulations achieve the same effect with ground up recycled glass.
- Nano film optics enable [thin night vision lenses](#), as well as [novel shaping](#) of light distributions. [2D nanosheets](#) being developed beyond graphene.
- [Seaweed bioplastic](#) packaging is now available for lighting, in time for California's [plastic packaging ban](#).



7. SMART(ER) BUILDING TECHNOLOGY.

[Artificial intelligence \(AI\)](#) is increasing the capabilities of building management systems (BMS), building automation systems (BAS), and building information modeling systems (BIM). AI analyzes BIM data to prevent equipment breakdowns and extend equipment lifetimes. Some research shows 20-30% reduction in maintenance costs, and a 15-20% increase in building system lifespans. AI-powered [predictive maintenance](#) is rapidly being adopted in different types of facilities, from industrial plants to corporate campuses. Interoperability is coming to BAS through [“universal automation,”](#) based on the IEC 61499 standard. AI+IoT enables more sophisticated energy management, adjusting lighting + HVAC continuously for up to a 30% reduction in energy use.



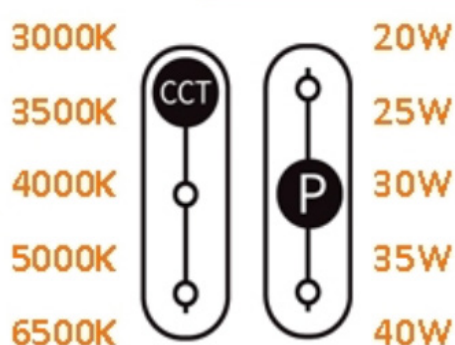
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8. BUILDING PERFORMANCE STANDARDS.



Local and state [building performance standards \(BPS\)](#) are increasing mandates that large existing buildings reduce their energy use and/or carbon emissions. BPS drive energy and carbon benchmarking as well as deeper efficiency retrofits. Many municipalities with BPS are actively increasing their enforcement capabilities. [New York City just tripled](#) its BPS enforcement staff.

9. FIELD-SELECTABILITY EXPANDING.



[Field selectable wattage & CCT](#) continues to expand. There are now luminaires that are 5-wattage & 5-CCT switchable, replacing up to 25 dedicated SKUs.

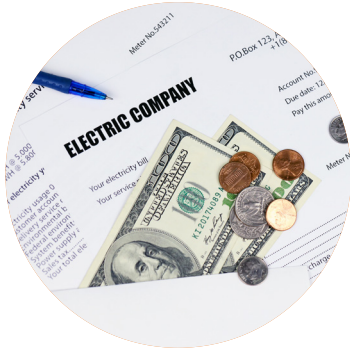
More manufacturers offer street and area lights with [switchable light distribution](#) patterns, using one of three different methods: an adjustable dial, field-changeable lenses, or turning on and off different combinations of individual LED chips to create different desired light distribution types / patterns.

10. LIGHT + HEALTH.

Circadian lighting is gradually gaining traction despite the lack of consensus on metrics. The American Lighting Association is launching a [new program](#) to certify and label residential circadian lighting. Quantus Airlines is introducing circadian lighting on long-haul flights to [reduce jetlag](#). There is increasing consumer interest in [red light sleep devices](#).

Beyond circadian lighting, research is advancing in the field of [optogenetics](#) that turn cellular activity on and off, with light. The IEA has published a new [comprehensive report](#) on SSL & Health that addresses many light + health issues beyond circadian entrainment, such as flicker, glare, myopia, and blue light hazard.





11. M&A. There is [increasing consolidation](#) among distributors, reps, and manufacturers. If interest rates continue to decline, it will accelerate mergers & acquisitions in 2025. Some consequences are detailed in the [NEMRA Manufacturer of the Future Report](#). Rep networks are getting reshuffled more frequently following acquisitions.

12. Electricity costs are beginning to spike. [Electricity rates](#) are increasing quickly due to electrification, AI data centers, and reshoring of manufacturing. Retiring of fossil fuel generation and increasing renewable, intermittent generation is challenging grid operators. High electricity rates [increase the ROI](#) for lighting retrofits and NLC.



13. Indoor farming resurgence. Controlled environment agriculture (CEA) is making a [comeback](#), after a collapse of many large vertical farm startups. However, greenhouses have significant advantages over vertical farms in the medium term, due to lower lighting energy costs. There are efforts around the globe to see if indoor farming of [expensive spices](#) can save vertical farming. One vertical farm is experimenting with genetically modified crops that [grow without light](#).

14. Fewer lighting trade publications. Electrical News recently shut down. tED replaced [lightED](#) with [electrifiED](#). LightSPEC magazine (formerly Architectural SSL) merged into Architectural Products magazine. Randy Reid announced his [pending retirement](#) from the many lighting publications that he has managed: Edison Report, designing lighting, LM&M, and more.



- 15. Expansion of wildlife-friendly lighting.** There are growing voluntary and regulatory efforts to employ wildlife-friendly outdoor lighting: [turtle safe](#), [bird safe](#), [pollinator safe](#), and [bat safe](#). Turtle safe lighting is expanding to more types of outdoor lighting products, including [tape lights](#).

There is a European push toward red streetlights to protect bats, while research is showing red streetlights come with [significant risks](#) to other wildlife and humans. Red lights also have roughly half the efficacy of white lights.

- 16. Growing dark sky awareness.** There is growing awareness of the need to fight light pollution among the general public, municipalities, and the hospitality industry. [Dark sky sanctuaries](#) are increasing globally. There is significant growth in [residential dark sky luminaires](#), not just commercial. Dark Sky International is working on a new specification for residential dark sky luminaires. A [new Dark Sky Lodging](#) program has been launched. There has been growth in the [DLC Luna](#) program that fights light pollution. Illinois passed a [state light pollution law](#) for any outdoor lighting purchased with state funds.



- 17. New animal welfare agricultural lighting approaches gain traction.** There are new theories on animal welfare agricultural lighting for poultry ([gradient lighting](#)) and dairy farms ([long-day lighting](#)). This is changing the lighting products (spectrum, light distributions, and controls) for these niche markets, as well as hours of operation.

- 18. Aging workforce changes how many businesses operate.** The aging of the workforce and increasing retirements is creating a talent shortage in lighting, the trades, reps, as well as many other industries. Many younger workers prefer a collection of part-time opportunities and are less interested in a traditional full-time role, for a single employer.

Some predict half of facility management jobs will go [unfilled](#) by 2025. Facility managers are expected to increasingly rely on (and manage) contractors to get work done. New software platforms help match contractors to facility management needs. Skilled trade labor shortage will push construction to greater automation, off-site construction of major components, and components with simplified installation processes that require less on-site labor. Larger luminaires are increasingly being designed with simplified [one-person mounting hardware](#). The talent shortage is also impacting training, tools, and workforce composition. Labor saving products and features will become increasingly popular.

- 19. Circularity in luminaires.** There is growing activity around luminaire [life cycle assessments \(LCAs\)](#) and [environmental product declarations \(EPDs\)](#). Circularity and the TM66 standard in the UK have resulted in sustainable street and area lights made of [wood](#)! Apprime Lighting is an example of [design for circularity](#), in the US. They've designed toolless removal of a troffer light engine, and then reuse of the engine chassis with new modules and drivers. There are continually more innovative 3D-printing polymers made from [recycled fishing nets](#), [coffee grounds](#), clothing, carpet fibers, dense plastic containers, and recycled packaging. There are also now [optically clear](#), 3D-printed luminaire diffusers made from recycled materials. [Zhaga standards](#) are also supporting circularity in lighting.



20. Tougher harsh environment luminaires. Increasingly durable industrial luminaires are able to withstand higher temperatures [up to 212 degrees F](#), and survive in dirtier, harsher environments. Remoted drivers improve thermal management.

21. Greener buildings. Reducing the environmental impact of facilities is driven by corporate ESG mandates, government regulations, incentives, the growing need for resiliency, and lowering utility costs. Circular economy principles emphasize using renewable, recycled, and recyclable materials. [Facility managers](#) are also pushed to reduce waste, decarbonize, and advance electrification. These trends increase interest in energy efficiency and reducing energy use through controls.

22. More lighting control trade shows. There are a growing number of [lighting control trade shows and conferences](#). These include the DCL Controls Summit, NYControlled, Lightapalooza, CEDIA Expo, Smart City Connect Conference & Expo, and arguably the IES Street & Area Lighting Conference (SALC), which, in part, features smart city control platform providers.

23. Proliferation of green, healthy, and smart certification programs. The rise of [green and health certification](#) programs for both products and [buildings](#): WELL, Fitwell, Declare, EcoVadis, Green Globes, and more.





24. Solar luminaires benefits increasing. Until recently the primary benefits of solar lighting were avoided costs for trenching, cabling, and electricity. Increasingly though, solar streetlights are being specified to fight the theft of copper wire between conventional streetlights.

Solar lighting is also increasingly incorporated by [homebuilders](#), in hurricane prone states. An example is D.R. Horton partnering with Streetleaf for more resilient streetlights in their communities. The poles are designed for 160 mph wind speeds, and the lights operate when the grid is taken down by a severe storm. Other solar luminaire manufacturers include [iLamp by Conflow Power Group](#), Soltech, and Light Efficient Design.

25. IT trends impacting lighting. There is a growing trend toward [sales and operations software](#) designed specifically for the lighting and electrical markets.

[E-labeling](#) is increasing on products and packaging, with QR codes pointing to web-based product information. Standardization of e-labeling is also occurring. There is a [deepening and narrowing](#) of operational work flows using AI. A new [FCC IoT cybersecurity labeling](#) program has been launched.



Conclusions

Energy efficiency has historically been a major force in the lighting industry, providing cost-reductions, environmental benefits, and in the case of LED lighting, reduced maintenance, and enhanced controllability. Today, many other concerns are forcing changes onto the lighting industry, whether that's eliminating mercury containing lamps, sustainability goals, or the electrification of transportation making EV chargers a common sight in the lighting industry.

You can continue to keep up with the latest trends at LightNOW. Special thanks to Naturalled for sponsoring this white paper.