ENERGY OBSERVER
A MONTHLY NEWSLETTER FROM AMERLUX®

JAN 2018


## Exterior

**The right light lets you own the night. Amerlux exterior solutions change the way you see the outdoors, from aesthetic landscape lighting to brilliant floodlights, to architectural post-tops, integrating light and security on a whole new level.**

**So much happens at night, and you want to see it all, correctly. Color shouldn't fade with the sun, so we engineer effective visual performance factors into every light, based on venue and uses.**

**At the same time, our products don't give up lumens to the night sky-efficiency and cost savings are pivotal.**

**Our Avista® LED, Salvus® and new Chaperone are among our flagship exterior lines.**

**For a complete listing of our Exterior Products:**
**http://www.amerlux.com/products/exterior**

**LED Energy Market Observer:**

Strategies in Light® THE LED SHOW® lightspace california 2018

Technology. Application. Inspiration.

1. **February 13 - 15, 2018 – LONG BEACH CONVENTION CENTER, LONG BEACH, CA** - The lighting industry has been steadily marching beyond the LED component to the capabilities of digitally-controllable solid-state lighting (SSL), which can now be connected to other devices and to networks and the broader Internet — in what we know as the Internet of Things (IoT). Players in the SSL market are thinking outside of the light source and looking toward a disruptive service and business model, and to enabling emerging applications. Indeed, it is and has been the overarching theme of the Strategies in Light (SIL) conference program and associated events since the first SIL conference in 2000. The themes of the three 2018 Strategies in Light conference tracks:

- Track 1, Emerging applications that will accelerate market growth
- Track 2, Advanced technologies to address new market realities
- Track 3, Connected lighting at the center of IoT

http://www.strategiesinlight.com/index.html

2. **Electricity Prices Plummet as Gas, Wind Gain Traction and Demand Stalls** - The rapid rise of wind and natural gas as sources of electricity is roiling U.S. power markets, forcing more companies to close older generating plants. Wholesale electricity prices are falling near historic lows in parts of the country with competitive power markets, as demand for electricity remains stagnant while newer, less-expensive generating facilities continue to come online. https://www.wsj.com/

3. **DOE Announces $100 Million Open Solicitation for Transformative Energy Projects** - The U.S. Department of Energy (DOE) announced up to $100 million in funding for new projects as part of the Advanced Research Projects Agency-Energy's (ARPA E) latest OPEN funding opportunity. OPEN will support America's top innovators through dozens of early-stage research and development projects as they build technologies to transform the nation's energy system. The projects selected under OPEN in 2018 will pursue novel approaches to energy innovation across the full spectrum of energy applications. The agency collaborates across the department's extensive research enterprise, providing support that complements existing DOE-wide initiatives. The deadline to submit a concept paper is February 12, 2018 at 5:00 p.m. E.T. https://arpa-e.energy.gov/

4. **DOE Publishes Its Third-Ever "US Lighting Market Characterization" (LMC) Report** - The agency uses it in part to guide its research and development (R&D) program. The latest version of the U.S. Lighting Market Characterization estimates the installed stock, energy use, and lumen production of all general-illumination lighting products operating in the U.S. in 2015. https://energy.gov/sites/prod/files/2017/12/f46/lmc2015_nov17.pdf

5. **Control the Lights from Your Phone at Hilton** - Dubbed 'Connected Room', the technology allows guests to also control the temperature, the TV and the window blinds. Connected Room is live in one hotel but will be rolled out in coming weeks in several more, and will begin to scale rapidly to hotels across the United States in 2018. In the longer-term, Connected Room will support a range of connected devices, engagements and experiences. Guests will able to use voice commands to control their room or access their content, and to upload their own artwork and photos to automatically display in their room. Guests will also be able to set various preferences in their Hilton Honors account profile to further customize their in-room experience to their individual preferences. http://luxreview.com/article/2017/12/control-the-lights-from-your-phone-at-hilton

6. **Linear LED Lamps: Application and Interoperability Evaluation** - CLTC recently collaborated with the Emerging Technologies group at Pacific Gas & Electric Company to evaluate linear LED lamps in a variety of luminaire applications, as well as identify cross-compatibility issues of select products. The goal of this project is to evaluate linear light-emitting diode (LED) lamps intended to replace equivalent linear fluorescent systems when operating under real-world conditions expected of commercial retrofits and in fixtures other than recessed troffers. Project objectives include evaluation and documentation of product performance as compared to a standard linear fluorescent baseline in terms of photometrics, energy use, and cross compatibility of products within linear LED lamp type categories A and C. https://cltc.ucdavis.edu/

7. **Lighting as a Platform Part I: What It Is and Why You Should Care by Martin Woolley, Bluetooth SIG** - Lighting offers intriguing possibilities in a smart building. It's permanently powered and found more or less everywhere. Installing new wireless network innovations lets you create a natural connectivity grid, allowing lights, switches, and associated sensors to communicate directly, without intermediate controller devices and of course, without wires. The benefit of losing the wires should not be underestimated. Not only is the cost of materials and labour needed to install and commission the system at the start reduced, but the wireless relationship between lights, switches, and sensors makes for a much more flexible system, allowing changing requirements to be accommodated more quickly, more easily, and at a lower cost. New and exciting technology enablers create the opportunity for building truly smart environments where lights can be much more than just lights. http://www.ledsmagazine.com/

8. **Lighting as a Platform Part 2: Creating the Smart Building by Martin Woolley, Bluetooth SIG** - In a truly smart building, lights can be much more than just lights. These buildings are supported by lighting systems that have the potential to act as a distributed network of small computers and are capable of hosting all sorts of other applications, enabling the creation of true smart building services. Inherent interoperability, fundamental device behavior models, and value-added capabilities are all critical to making the concept of the true smart building a reality. Smart lighting systems only work seamlessly when the components of those systems — lamps, switches, controllers, and sensors — connect and communicate with each other. This can only happen if those components adopt and adhere to a common technical standard. http://www.ledsmagazine.com/

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**Global LED Energy Market Observer:**

9. **Global LED Bulb Prices Were Stable in November 2017** - According to LEDinside report, the global ASP of 40-watt equivalent LED bulb was US$ 6.2, a slight increase of 0.5%. The global ASP of 60-watt equivalent LED bulb increased slightly by 0.2% to US$7.4. Japan saw significant price slide while Europe witnessed price growth. The prices were stable in China's LED package market in November despite slight decline in LED chip prices. However, the price decline did not have much impact on the industry. Many of China's lighting LED package suppliers tend to expand their business to the automotive lighting market. http://bizled.co.in/

10. **Zumtobel Supplies Lighting Solution for Oslo Airport with 21,200 LED Luminaires** - The international lighting group Zumtobel Group has equipped the new terminal at Oslo's airport with a modern lighting solution. Within the scope of the project, more than 21,200 Zumtobel and Thorn brand LED luminaires with Tridonic technology inside were installed. Furthermore, the terminal became equipped with a well-thought-out emergency lighting and a lighting control system from Zumtobel Group Services (ZGS). The total order volume amounts to more than 5 million euros. http://www.solidstatelightingdesign.com/

11. **LED Lighting Module Market Poised to Triple in Five Years** - The LED lighting module industry is showing the emergence of innovative functions and the introduction of new market segments including automotive, smart lighting and horticultural markets. In this context, Yole Développement (Yole) estimates the market and presents its vision of the industry in its new technology and market report titled LED Lighting Module Technology Industry & Market. According to Yole's Solid State Lighting team, the LED lighting module market, including flexible LED strips, reached nearly US$4 billion in 2016 and will grow to US$13.8 billion by 2022. Yole's report provides a comprehensive overview of the LED lighting modules including technologies, markets and applications, main functions and integration into lighting systems. http://www.yole.fr/LED_Modules_MarketTrends.aspx#.WjSQmUxFzOk

12. **LED lighting at all Indian railway stations by March 2018** - With the aim to cut power consumption, the Indian Railways announced that it illuminate all railway stations 100 per cent by LED lighting by March 31, 2018. Under the initiative, all railway staff colonies, stations and platforms will be lit using power saving LED lights. Indian Railways has already installed over 20 LED lights in over 3,500 railway stations till November 2017. http://bizled.co.in/led-lighting-at-all-indian-railway-stations-by-march-2018/

13. **LED Lighting Drivers Market to Grow Owing to Green Initiatives** - The global LED lighting driver market, on the basis of driving method, is segmented into constant volume and current volume. In light bulbs, light is generated by a tungsten wire which only converts a small portion of energy into visible light. This principle was followed for many years due to its simple structure & pleasant light. LED lights although have a higher luminous efficacy than light bulbs, luminaires were not considered as a replacement for light bulbs. So, in comparison to light bulbs LEDs need special attention on the power source which means, if LED's are insufficiently supplied with energy the light keeps flickering or is perceived as choppy. This report studies LED Lighting Drivers in Global market. https://www.millioninsights.com/industry-reports/led-lighting-driver-market

14. **Jet-Lagged? Stop by the Circadian Lighting Lounge at Oslo Airport** - tunable LED lighting can help keep peoples' circadian clocks in check, why not enlist LEDs in the war against jet lag? Without diving into the science, blue frequencies can stimulate, and ambers can relax In one of the latest developments, Scandinavia's SAS has taken the battle into the airline lounge. It has outfitted its premium waiting area at Oslo Airport with a collection of tunable LED lights from Philips Lighting to help passengers dose up with stimulation or relaxation as they see fit. You'd have more options in one of three of the Hue rooms. These are smaller private areas where you can shut the door and adjust the Philips LED Hue lights to one of six settings, ranging from relaxing — such as the dimmed warm "Night" or a sunrise setting called "Savannah" — to an "Energize" setting of cold white/blue light. http://www.ledsmagazine.com/

15. **Osram Is Driving the Future of Automotive LED Lighting** - Osram is lighting the way to the future of driving. At CES 2018, it will continue to reinvent light by expanding and enhancing the experience for drivers, passengers and others on the road, turning invisible light into visible benefits: From lasers that play a key role in LiDAR, which enables autonomous driving, to infrared LEDs that support Advanced Driver-Assistance Systems such as lane departure warnings. Osram also develops technology to enable smart headlights that notify drivers of obstacles in the road, and biometrics that can detect when a driver is having a health emergency. And it is the first to present technologies with LED and laser light sources that are suitable for both light and symbol projection on the road. http://bizled.co.in/osram-is-driving-the-future-of-automotive-led-lighting/

16. **Flexible Displays to Drive OLED Growth in 2018** - Display Supply Chain Consultants (DSCC) has released the first issue of its Quarterly OLED Shipment and Fab Utilization Report that raises the bar on OLED market insights. Covering all OLED suppliers and all applications, this new report provides shipments, prices and revenues by panel supplier by application by customer by size by resolution for Q1'16 – Q3'17 with projections through Q4'18. The report also forecasts the market on an annual basis from 2016 – 2022. Quarterly OLED revenues exceeded $5B for the first time in Q3'17 and are expected to rise 88% Q/Q and 153% Y/Y in Q4'17 to $10.0B. Flexible smartphone OLEDs are driving the revenue growth on pent-up demand for the iPhone X. https://www.displaysupplychain.com/dscc-reports-quarterly-oled-revenues.html

17. **LG Display's Massive Surge in OLED Light Panel Production** - LG Display announced that the company started mass production at its new Gen 5 OLED light panel production line in Gumi, Korea and launched its new OLED light brand, Luflex. With these moves, the company will lead the lighting market, providing a powerful boost to the nascent sector globally. OLED light panels offer high commercial potential for lighting manufacturers. As a lighting solution, OLED is easier on the eyes than conventional sources such as fluorescent and LED, as it is very close to sunlight and offers great uniformity in its luminescence. It is virtually heatless and at just 0.41mm thick, OLED light panels are super slim and their flexibility means that they can be creatively shaped into curves or spirals. http://bizled.co.in/lg-displays-massive-surge-in-oled-light-panel-production/

18. **"UV Power" Research Project is Working on LED-replacements for Conventional UV Light Sources** - Since February 2017, a total of five research institutes and companies have been working on "UV Power", a collaborative project funded by the German Federal Ministry of Education and Research (BMBF). The partners have made it their goal to provide high-power UV LEDs to cover a wide variety of applications. These LEDs will eventually replace conventional UV light sources, which often contain toxic mercury, in areas such as production, disinfection, the environment, life sciences and medicine. UV LEDs are also likely to open up new areas of application. http://www.ledinside.com/

19. **Industrial & Commercial LED Lighting Market Likely to Reach $79.49 Bn** - The global industrial and commercial LED lighting market was valued at $29.60 billion in 2016 and is projected to reach $79.49 billion by 2023, growing at a CAGR of 14.9% from 2017 to 2023. Europe dominates this market at present, followed by North America. In 2016, Germany dominated the market in Europe; similarly, the U.S. led the overall market in North America, while China dominates the market in Asia-Pacific presently. The residential segment led the global market, followed by the commercial in 2016. However, industrial application segment is expected to depict highest CAGR throughout the forecast period. http://bizled.co.in/

20. **LED Lighting Market Growing At 14% CAGR & Will Cross US$ 105 Bn By 2023** - In the last few years, as the world is witnessing rapid industrialization and urbanization, the government is working towards the development of various LED standardization which is helping the industries to adopt this technology. Phillips Lighting Holding B.V. (Netherlands), General Electric Company (U.S.), Osram Licht AG(Germany), Cree Inc. (U.S.), Cooper Industries, Inc. (Ireland), Virtual Extension (Israel), Dialight Plc. (U.K.), Zumtobel Group AG (Austria), Samsung (South Korea), Sharp Corporation (Japan) among others are some of the prominent players profiled in MRFR Analysis and are at the forefront of competition in the global LED Lighting market. High need of energy efficient lighting solutions around the world and government initiative towards the use of standardization of LED lighting is playing vital role in the growth and development of the market. http://bizled.co.in/

21. **Automotive Adaptive Lighting Market to Grow at CAGR of 13% Till 2023** - According to the "Global Automotive Adaptive Lighting Market Research Report Insights, Opportunity Analysis, Market Shares and Forecast, 2017 – 2023" report by Research and Markets, the adaptive lighting market has increased the safety through providing automatic settings for downlight and headlight. The demand for car adaptive lighting is expanding altogether attributable to various elements, for example, escalating vehicle sale volume and strict government regulations. The automotive adaptive lighting market has developed widely and is on the shift from conventional lighting systems that cover halogen, xenon and others. The global automotive adaptive lighting system has been divided into technology, application, vehicle type and distribution channel. http://bizled.co.in/

22. **Genius HTC Light Bulb Could Save Your Life** - The new light bulb uses smarts from the HTC Vive VR headset technology to be more aware of its surroundings. The idea is for the bulb to detect if a person has had a bad fall, in a bathroom for example. This will be done using the room detection smarts of the sensors used by the HTC Vive to detect movement of the VR headset wearer - only in this case without a headset involved at all. The device uses motion detection and a specific set of rules. If a person falls this will be recognized by the bulb. This is then able to recognize that the person has not only fallen but is stuck in that position. Presumably the device will then be able to contact someone for help. At the moment the super smart light bulb is still in the patent stages. After signing a $1.1 billion deal with Google recently we could see this sort of tech folded into other devices like the Nest cameras, for example. https://www.msn.com/

## National Energy Market Observer:

23. **GE to Cut 12,000 Jobs in Electrical Power Division** - The jobs are in the electrical power division, which makes the giant turbines and generators that the company estimates provide about one-third of the electricity produced around the world. GE is by far the worst-performing stock in the Dow this year, down 44%, and CEO John Flannery, who took over in August, has been trying to slash costs. The company says the job cuts will mostly be outside the United States. The electrical power division's headcount will be reduced by about 18%. About 295,000 people worked for GE overall at the end of last year, but the company has cut jobs and costs throughout this year. Flannery is trying to make the company more nimble and focused on its strengths -- health care, power and aviation. GE has put its railroad business up for sale and is even looking for a buyer for the part of the company that makes light bulbs. https://www.msn.com/

24. **Ellis and Solomon Yan to Regain Control of TCP; Merger Announced** - TCP International Holdings, Ltd. (TCP) today announced that it has entered into a definitive merger agreement pursuant to which, and subject to the terms and conditions set forth therein, a group controlled by Ellis Yan and Solomon Yan will acquire all TCP shares not owned by the buyers or their affiliates. Under the terms of the agreement, which was unanimously approved by TCP's Board of Directors, TCP shareholders will receive per share consideration of $1.00 in cash. The merger is subject to certain closing conditions, including approval by at least 90 percent of TCP's shareholders and receipt by the buyers of sufficient financing to repay certain of TCP's indebtedness. The merger is expected to be completed prior to the end of TCP's first quarter of fiscal year 2018. 12/13 PRNewswire

25. **Zigbee Alliance and Thread Group Bring Dotdot Specification to Thread IP Network** - The Zigbee Alliance and Thread Group reported the availability of the Dotdot specification over Thread's IP network. The Zigbee Alliance is a foundation devoted to the establishment of wireless open standards for Internet of Things devices and networks. The alliance offers certification programs and a suite of open IoT solutions. The Thread Group promotes the Thread open wireless mesh network control protocol for IoT networks and device communication. The Zigbee Alliance says that the availability of the Dotdot specification over Thread's IP network, is the first time developers can confidently utilize an established, open, and interoperable IoT language over a low-power wireless IP network. Furthermore, the alliance says that this availability will help unify the fragmented industry of connected devices and open new markets. http://www.solidstatelightingdesign.com/

26. **NEMA and Industrial Internet Consortium Announce Liaison** - NEMA and IIC have agreed to enter a formal liaison to advance the Industrial Internet of Things (IIoT). A liaison relationship fosters common understanding of new technologies for the digital economy. IIC is the world's leading membership program transforming business and society by accelerating IIoT. Its Liaison Working Group is the gateway for formal relationships with standards and open-source organizations, consortia, alliances, certification and testing bodies and government entities/agencies. For more information, visit https://www.NEMA.org

## Monthly Feature:
### The 10 Big Lighting Trends for 2018

The big themes of digital disruption and uncertainty will continue into next year, but there'll be lots of micro trends from human-centric lighting to Li-Fi. Lighting is is changing, and the next 12 months will be a defining period in the sector as we move away from an energy-saving offer to fully embrace all things digital. The global Light + Building show in March 2018 will be a key moment, and all the while disruption and uncertainty look set to be continuing themes. Here's how Lux sees the big trends to watch for in 2018:

**Luminaires will boast more functionality**
Expect this to be a big trend at Light + Building in Frankfurt in March. Due to increased commoditization and falling prices, light fittings simply won't just illuminate any more. They'll have on-board capabilities such as increased intelligence, sensors, build-in wireless connectivity and color tuning. Expect buzzwords such as 'IoT ready' and 'digital light'.

**Controls will leave the cupboard**
Traditionally, lighting controls have resided in a big black box of electronics which sat in a cupboard. In 2018, expect to see the intelligence move into the luminaire. The interface will increasingly be standard devices using Bluetooth. The 'self-learning' algorithms popular on consumer thermostats will also begin to appear as standard on lighting control platforms.

**Emergency lighting standards will be driven up**
Sir Martin Moore-Bick's inquiry into the London's Grenfell Tower fire kicks off in earnest in 2018, and a spotlight will be shone on the regulations, standards, guidance, specification, installation practice and maintenance regimes for emergency lighting. It will be an uncomfortable watch for the industry, but should concentrate minds and drive up standards.

**Li-Fi will begin to get adopted**
Thanks to the launch at LuxLive in November of a range of certified kit, including drivers and luminaires, we expect to see the delivery of the internet via visible light start to gain traction in the market. Early adopters will be in the security, military and diplomatic sectors where computer users want the convenience of Wi-Fi but without its vulnerabilities.

**Lighting will join the connected office**
The so-called 'connected office' will start to become a reality in 2018, driven by the big property developers. Companies such as Land Securities and CBRE – under pressure to be seen to be innovating in the sector – already have extensive trials of IoT lighting and will be the ones to create compelling use cases for their clients. The big drivers will be well-being and productivity.

**Bluetooth will win the protocol war**
After two years of internal wrangling, Bluetooth chiefs have ratified a standard which meshes together its beacons, allowing them to give instructions to each other. The move boosts Bluetooth's reach far beyond the typical10m range that's familiar to consumers. In 2018 expect this development to drive IoT lighting into retail, warehouse, commercial offices, and other locations.

**Human-centric lighting will get serious**
Current 'human-centric' lighting installations are often unworthy of the name; 'colour temperature-changing' would be a better term. However, thanks to an increasing body of research from Scandinavia in particular, expect to see more and more true human centric systems installed. Offices and care homes, especially those with dementia patients, will be first.

**Lighting pollution will be a major issue**
Lighting pollution has been an issue in the industry for decades, but expect clients and regulators to take it super seriously in 2018, driven by increased awareness and concerns that the low price and cooler colour temperatures of LEDs are causing more lighting pollution more than high pressure sodium ever did.

**The WELL Building standard will be big**

It may be an American import and the product of an independent, non-government organisation, but the WELL Building Standard is rapidly gaining traction on this side of the pond as current guidance fails to keep up with trends in workplace wellbeing and productivity. Clients see it as added value for their tenants, so expect lighting specs to demand compliance in 2018.

**The industry will be driven by consolidation and partnerships**

Stand-alone lighting manufacturers will look increasingly isolated in 2018 as consolidation really takes hold in the market. Expect to see lots of acquisitions and mergers as the fragmented industry tidies itself up. But the really big trend will be partnerships – such as the Philips and Cisco tie-up – where lighting makers buddy up with tech specialists.