ENERGY OBSERVER
A MONTHLY NEWSLETTER FROM AMERLUX®

NOV 2017

Available now: Three Amerlux Exterior Lighting Solutions
www.amerlux.com

Avista – Cost-Effective, Energy Efficient, Pedestrian Lighting Retrofit
Cost-effective pedestrian lighting option utilizing the latest technology, which extends the product's useful life by protecting it from rain and snow.
Features & Benefits:

- Avista LED light engine retrofit with advanced optics, a new driver and an updated LED board which meets new 4.0 standards of the Design Light Consortium (DLC), which qualifies the product for energy cost savings and potential rebates to shorten the payback period and improve your return on investment (ROI).
- Breakthrough IP66 sealed LED Optical Chamber prevents water intrusion and extends the fixture's useful life, while replacing outdated HID light sources.
- Versatility makes it perfect for new construction or retrofits. The product, which is available for post top or teardrop-style luminaires, offers specification options, including wattages up to 68W and a lumen output up to 7500. A choice of 2700K, 3000K or 4000K CCT is available.

Passo - Maintenance-Free Step Lights
Versatile, weatherproof, aesthetically pleasing step lights and recessed wall luminaires.
Features & Benefits:

- Step light made for both outdoor and indoor applications, improving safety on stairs and paths with high performance, low glare and sleek design. Boasts game-changing innovation, featuring an independently sealed LED Optical Chamber and a fully potted driver that keep the elements out of critical areas and compensate for typical issues with in-wall or step luminaries to keep the product virtually maintenance-free in all-weather applications.
- Wide selection of sizes, faceplates, color temperature and light output to meet the specifications of many projects. A choice of solid color composite, brushed stainless steel or painted cast aluminum faceplates provide many options. The Passo step lights include louvered, soft glow or directional light output options
- Retrofit styles are made to easily replace costly, high-maintenance step lights that have already been installed. The IP66-rated LED unit can be retrofit into the housing of most compact fluorescent fixtures in about 15 minutes, saving countless dollars in labor expense.

Chaperone – Glare Free, Safety First Garage Lighting
Parking garage that is safe and secure, results in fewer accidents and crime that could harm an organization's reputation.
Features & Benefits:

- LED Indirect Garage Luminaire that renders old HID or fluorescent fixtures obsolete and turns dark, dingy garages into safe, pedestrian-friendly spaces.
- The instant-on Chaperone Garage Luminaire is designed to easily replace ceiling-mounted garage fixtures as a complete solution that can be seamlessly integrated with many different control system options. The luminaire is an ideal energy saver, replacing linear fluorescent, HPS and metal halide fixtures.
- Chaperone is offered in 3 different wattages with a lumen output up to 7,370 lumens in 4000K or 5000K CCT. The standard models are dimmable with a 0-10V dimming system.
- Control options include a line voltage occupancy sensor that provides direct lighting control with the 0-10v LED driver. Full power is delivered when motion is detected and switches to a lower dimming level after the area is vacated. Dim levels can be manually set to 5, 10, 20, 25, 33 or 50 percent.

LED Energy Market Observer:

1. **$4 Billon LED Lighting Module Market to Grow More Than Triple by 2022** - 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. http://bizled.co.in/4-bn-led-lighting-module-market-to-grow-more-than-triple-by-2022/

2. **Meet The 10 Disruptors Transforming Lighting** - Here they are...the key individuals driving the industry into a brave new world of digital, connected lighting. These visionary men and women are bringing rapid and radical change to a sector that's more used to long product cycles and traditional glass and sheet metal technologies. Selected by a panel of Lux Review senior editors, they are shaping our future: http://luxreview.com/article/2017/09/meet-the-10-disruptors-transforming-lighting

3. **Everlight Introduces Infrared LED for Iris Recognition** - Taiwan-based LED producer Everlight Electronics Co., LTD. launched the NIR-C19M series with a wavelength of 810nm. According to the company, the NIR-C19M produces the clearest contrast effect for reading the pattern of the iris. The company says that with the new IR LED, the recognition process is precise and quick, and its package design offers excellent heat dissipation. Everlight says that the IR LED is, therefore, ideally suited for iris recognition in security surveillance systems (access control) and portable handsets. Smart biometric identification enables devices to measure the users' unique patterns in their voice, fingerprint, iris, and face to quickly avoid the problem of remembering traditional long passwords. http://www.solidstatelighting.net/everlight-introduces-infrared-led-iris-recognition/

4. **Circadian Stimulus Calculator** - Biological rhythms that repeat approximately every 24 hours are called circadian rhythms. Light is the main stimulus that helps the circadian clock. The Lighting Research Center (LRC) has released a new version of its CS calculator with more robust and flexible functionality to help lighting professionals select light sources and light levels that will increase the potential for circadian-effective light exposure in architectural spaces. The new calculator provides additional functions not included in the original version, including the ability to calculate CS levels in rooms with multiple light sources, and combine pre-loaded SPDs from the calculator dropdown and user-supplied SPDs to provide one CS measurement and a single relative SPD. http://www.lrc.rpi.edu/programs/lightHealth/index.asp

5. **IES Research Symposium 2018 Call for Posters** – How does light during the day and night affect our circadian, biological, and behavioral responses? At the 2018 IES Research Symposium, Light + Human Health, we will hear the latest research and consider how this research might affect current and future design applications. The Symposium will bring together researchers and design professionals for an open exchange of ideas that will influence future priorities for developing and adopting metrics, standards, and recommended practices. At the Crowne Plaza, Atlanta Midtown | Georgia | April 8-10, 2018. Researchers and designers actively involved in the study and practice of light and lighting are invited to submit posters describing their work and how human health can be affected as a result. Deadline for abstract submission: December 15, 2017. Learn more at: https://ies.us13.listmanage.com/track/click?u=c074ef46db58e257034ce69c6&id=5c1cbee7ec&e=a524b08e21

6. **Li-Fi Firms Gather to Unveil First Lights at LuxLive** - Innovations from the top three firms PureLiFi, Linmore and Lucibel – including, for the first time, Li-Fi-enabled battens and downlights – will be unveiled at the event, marking LiFi's global commercial debut. PureLiFi and Lucibel will introduce their joint-venture Ores luminaire, which embeds all the necessary Li-Fi components in an LED downlight. It is able to support between eight to 16 users at once, and deliver data at rates of 45 megabits per second. Meanwhile US firm Linmore is launching the first-ever Li-Fi battens, designed as a retrofit for fluorescent luminaires. These light fittings deliver data speeds of up to 43 Megabits-per-second (Mbps) up and down. The luminaires will all be demonstrated in the Li-Fi Experience at LuxLive 2017, which takes place at London ExCeL on Wednesday 15 November and Thursday 16 November 2017. http://luxlive.co.uk/

7. Blu**etooth Mesh Shows Wireless Connectivity in a Whole New Light by Jason Marcel** - Wired lighting infrastructures have a history of providing dependability that, until recently, wireless networks couldn't match. And while there are other benefits to installing a wired network, many of today's wireless platforms—especially those supported by a Bluetooth® mesh network—ensure greater flexibility and extensibility at a reduced cost. https://www.bluetooth.com/ Advancements in wireless connectivity make it hard to justify choosing a wired infrastructure over a wireless platform. An argument could be made that wired networks still offer better reliability, but installation costs, for both materials and labor, are significantly higher. A wireless network provides significant cost savings with minimal disruption during deployment. Wireless platforms are easier to install and upgrade, offering the flexibility you need to respond quickly to changing business demands. http://www.ledsmagazine.com/

8. **Harbour Group acquires Green Creative LLC** - GREEN CREATIVE, a developer of advanced LED lighting solutions, is now part of the Harbour Group family of companies, extending Harbour Group's participation in the lighting market, Jeff Fox, Harbour Group's chairman and chief executive officer, announced today. Cole Zucker and Guillaume Vidal, the co-founders of GREEN CREATIVE, will continue their key leadership roles in the business. Terms of the transaction were not disclosed. The investment represents Harbour Group's second in the lighting industry this year. In April, Harbour Group announced that ILP Holdings Corporation (ILP), a Sanford, Fla.-based manufacturer of energy-efficient luminaires and retrofit solutions, had become a Harbour Group company. The Green Creative and ILP brands will remain independent. https://harbourgroup.com/news/

9. **DOE Announces FY 2018 SBIR/STTR Funding Opportunity** - The U.S. Department of Energy (DOE) Office of Science published the Fiscal Year 2018 Phase I, Release 1 Funding Opportunity Announcement (FOA) on October 17, 2017, for the Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. Under DE-FOA-0001770, whose complete listing of technical topics was released on July 17, DOE seeks applicants for grants directed toward FY18 Phase I, Release 1 projects. Topics for this funding opportunity can be found at http://science.energy.gov/sbir/funding-opportunities and include LED and OLED lighting (topic 14).

10. **Cree CEO Lights Up Stock on Possible Turnaround Plans** - CREE shares surged by double digits Wednesday 10/18 as its new chief executive fired up the LED lighting company's stock by indicating to analysts that a new strategic plan may be coming in a few months. Cree shares initially fell 6% after the company reported fiscal first-quarter earnings late Tuesday. But new CEO Gregg Lowe talked of preliminary turnaround plans on Cree's earnings call, sending shares soaring on Wednesday. It was unclear what plans Lowe might have. http://www.investors.com/news/

11. **Gooee Gives Equity Share to Cloud Software Partner, Launches 'Lighting As A Host'** - Gooee has enhanced its data analytics capabilities through a deal that gives its cloud computing partner Evrythng an equity share in the firm, a seat on the board, and that gives Gooee greater access to Evrythng's software. Gooee has been working with London-based Evrythng for two years, but has now agreed to pay Evrythng around $7.5 million for permanent access to Evrythng's Internet of Things (IoT) technology. The closer ties between the two companies strengthens Gooee's ability to gather data from lights equipped with its chipsets, and send that data off to the cloud for analysis. Such analytics then helps facilities managers to decide how better to use and operate rooms and buildings. http://www.ledsmagazine.com/

12. **White Paper: Extending the Life-Time of LEDs** - LED applications are becoming increasingly more diverse; design requirements, location or the function of the product are all elements that prove the challenges that face LED designers are continually evolving. LEDs, like most electronic devices will perform well until external influences start to deteriorate performance. Such influences can include the electrostatic attraction of dust, humid or corrosive environments, chemical or gaseous contamination, as well as many other possibilities. It is therefore extremely important that the end use environment is considered in detail to ensure the correct products can be chosen. https://www.led-professional.com/resources-1/white-papers/white-paper-extening-the-life-time-of-leds

13. **Target Gives the Go-Ahead on IoT Lights at Half Its Stores** - The world's largest known deployment of lighting-based indoor positioning is finally going full speed ahead, as US retail giant Target plans to roll out a customer engagement system in nearly half of its 1800 stores by Christmas. Using Bluetooth chips embedded in LED ceiling lights from Acuity Brands, Target will send signals to shoppers' phones. Drawing on a Target app, the phones will display an interactive map that guides individuals around the aisles, helping them find specific items and providing information about discounts. In a decision that will disappoint VLC advocates and which some observers will find surprising, the retail chain said it has decided to use Bluetooth but not VLC. http://www.ledsmagazine.com/

14. **GE Chief Will Sell, Spin Off $20 Billion of Businesses in Two Years** - John Flannery looks to simplify the conglomerate after a review begun when he was appointed CEO in June. While the Boston-based firm didn't specify which businesses would go on the block: "Everything is on the table, and there have been no sacred cows," Flannery said. Among the possible divestitures at GE is Baker Hughes. Wall Street analysts have suggested GE may consider selling assets from industrial lighting, which was part of retiring vice chair Beth Comstock's portfolio, to power conversion and even the locomotive division previously headed by new CFO Jamie Miller. The new CEO, who is detailing his strategy for investors in a Nov. 13 meeting in New York, continued to emphasize that he's fully committed to digital manufacturing. https://finance.yahoo.com/news/ge-chief-may-sell-spin-122100057.html

15. **Acuity Teams with Indoor Mapping Firm That Has Big Airport Presence** - Another day, another matchup between a lighting company and an IT firm in an effort to turn lighting infrastructure into intelligent data networks. This time, LED lighting stalwart Acuity Brands has teamed with LocusLabs, an indoor mapping software specialist which has provided wayfinding programs to major airports such as Dallas/Fort Worth International. LocusLabs is enabling its "location as a service" technology to work with Acuity's Atrius, which is Acuity's catch-all brand of an ever-widening set of smart lighting and lighting-based Internet of Things (IoT) services. http://www.ledsmagazine.com/

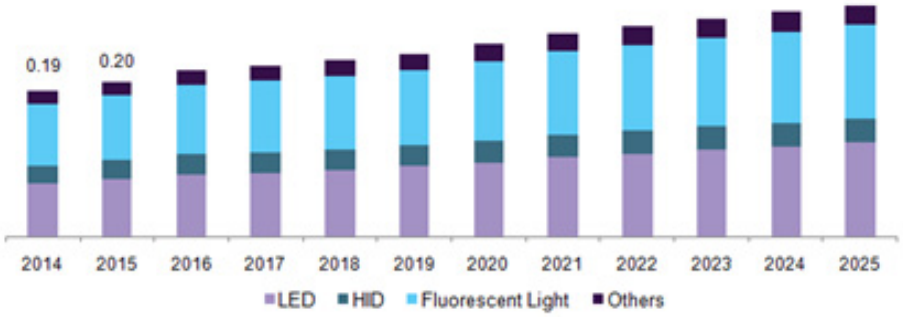
16. **30 Ways IoT Lighting Can Solve Everyday Problems by Ray Molony** - The next revolution in lighting is luminaires connected to the 'Internet of Things'. So what are the benefits? Click on the top 30 killer capabilities of IoT lights from the real world by application... http://luxreview.com/article/2017/10/30-ways-iot-lighting-can-solve-everyday-problems

- Retail
- Healthcare
- Offices
- Transport
- Outdoor
- Hospitality & Leisure

Global Energy Market Observer:

17. **Top Six Trend in LED Chip and Package Industry in China in 2017** - According to the latest report from LEDinside, a division of the market research firm TrendForce, 2017 Chinese LED Chip and Package Industry Market Report, Chinese LED package market scale in 2016 reached RMB 58.9 billion, went up by 6% YoY, higher than expected. LED price held steady in 2016, some products saw price growth, and the industry is still in an uptrend under the drive of fine-pitch, automotive and lighting markets. As for the market outlook in 2020, it is expected that the Chinese LED package market size will be up to RMB 73 billion. http://www.ledinside.com/

18. **High-End Lighting Market Analysis by Light Source Type** - The global high-end lighting market size was estimated at USD $14.43 billion in 2016. Increasing demand for connected lighting and interior designing is anticipated to be a key factor driving the industry growth. Increasing penetration of smartphones and internet connectivity is growing the demand for connected lighting systems, thus impacting the market growth. The market can be segmented by light source into LED lamps, HID lamps, fluorescent lights and others. The LED lamps segment is anticipated to exhibit high growth in this particular market over forecast period. The segment accounted for USD 5.12 billion in 2016 and is projected to grow with a CAGR of 6.8% from 2017 to 2025. HID high-end lighting market is expected to witness steep fall in revenue by 2025. http://www.grandviewresearch.com/industry-analysis/high-end-lighting-market



19. **Thorn Lighting to Provide 100,000 LED Fixtures for Mass Transit Project in Singapore** - Thorn Lighting has won a major lighting contract for Singapore's Thomson-East Coast Line, a 26-mile long mass transit project that will be completely underground, utilize driverless trains and give commuters at 31 stations access to Singapore's mass transit system. The US $11.75 million) project will utilize more than 100,000 Thorn LED luminaires in the TEL tunnels and maintenance areas. Thorn's AreaPak Pro, Chalice, CiviTEQ, Formula LED, GTLED, HiPak and PopPack brand LEDs will be used in the project. Thorn Lighting is part of the Zumtobel Group. http://www.electricalmarketing.com/

20. **White Paper - Serviceable Luminaires in a Circular Economy by LightingEurope** - Members have a long experience in dealing with aspects related to the circular economy. The industry has a solid track record in the areas of recycling, management of hazardous substances, improving efficiency and replacement of failing components for repair purposes. The transformation brought by the shift to LED technology demands a careful assessment of which areas could be further improved to bring benefits to customers and the environment and last not least to strengthen the competitiveness of the sector. This White Paper briefly introduces the concept of the circular economy and focuses on design for serviceability to assess its benefits; the last part discusses policy options which potentially could help transform the sector towards more "circular" products and services. The focus of this White Paper is luminaires. http://www.lightingeurope.org/

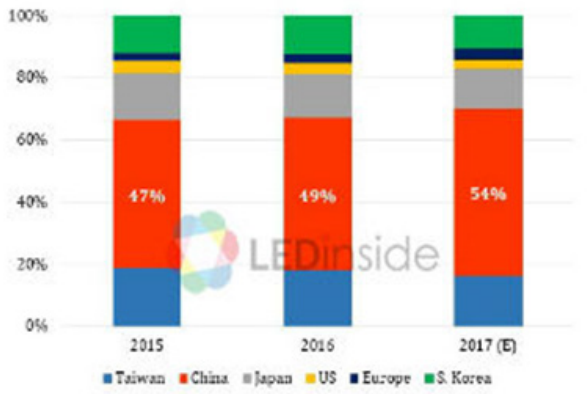
21. **Thorn Lighting to Provide 100,000 LED Fixtures for Mass Transit Project in Singapore** - Thorn Lighting has won a major lighting contract for Singapore's Thomson-East Coast Line, a 26-mile long mass transit project that will be completely underground, utilize driverless trains and give commuters at 31 stations access to Singapore's mass transit system. The US $11.75 million) project will utilize more than 100,000 Thorn LED luminaires in the TEL tunnels and maintenance areas. Thorn's AreaPak Pro, Chalice, CiviTEQ, Formula LED, GTLED, HiPak and PopPack brand LEDs will be used in the project. Thorn Lighting is part of the Zumtobel Group. http://www.electricalmarketing.com/

22. **White Paper - Serviceable Luminaires in a Circular Economy by LightingEurope** - Members have a long experience in dealing with aspects related to the circular economy. The industry has a solid track record in the areas of recycling, management of hazardous substances, improving efficiency and replacement of failing components for repair purposes. The transformation brought by the shift to LED technology demands a careful assessment of which areas could be further improved to bring benefits to customers and the environment and last not least to strengthen the competitiveness of the sector. This White Paper briefly introduces the concept of the circular economy and focuses on design for serviceability to assess its benefits; the last part discusses policy options which potentially could help transform the sector towards more "circular" products and services. The focus of this White Paper is luminaires. http://www.lightingeurope.org/

23. **Philips Lighting and Vodafone IoT Partner to Improve the Way Cities Function** - Philips Lighting has partnered with Vodafone IoT to provide customers with scalable M2M connectivity for connected lighting and beyond. Connected light points throughout the city can be monitored and controlled using Vodafone's IoT connectivity and existing cellular network infrastructure. https://www.youtube.com/watch?time_continue=7&v=zEPVW5OQTtA

24. **Chinese LED Chip Suppliers to Represent 54% of Global Production Capacity in 2017** - During 2017, global LED chip production capacity was on an expansion phase, according to LEDinside, a division of TrendForce. According to the report, this surge in capacity for LED chips is due to the rising demand from Chinese LED package suppliers who have already started increasing their production capacities since 2016. While Chinese LED chip suppliers are enhancing their capacity, LEDinside estimates that about 401 MOCVD chambers based on the standard K465i design will be installed worldwide by 2017 end. http://bizled.co.in/chinese-led-chip-suppliers-to-represent-54-of-global-production-capacity-in-2017/

Figure: Distribution of MOCVD Systems Installed by Country/Region, 2015-2017



Source: LEDinside, Oct., 2017

24. **Nichia Remained Revenue Leader in China's LED Package Market for 2016** - Steady growth in the LED lighting market supported the capacity expansion efforts of LED chip and package industries in 2016, says LEDinside, a division of TrendForce. Furthermore, the annual revenue of China's LED package market grew by 6% for 2016 to reach US$8.9 billion. http://www.ledinside.com/

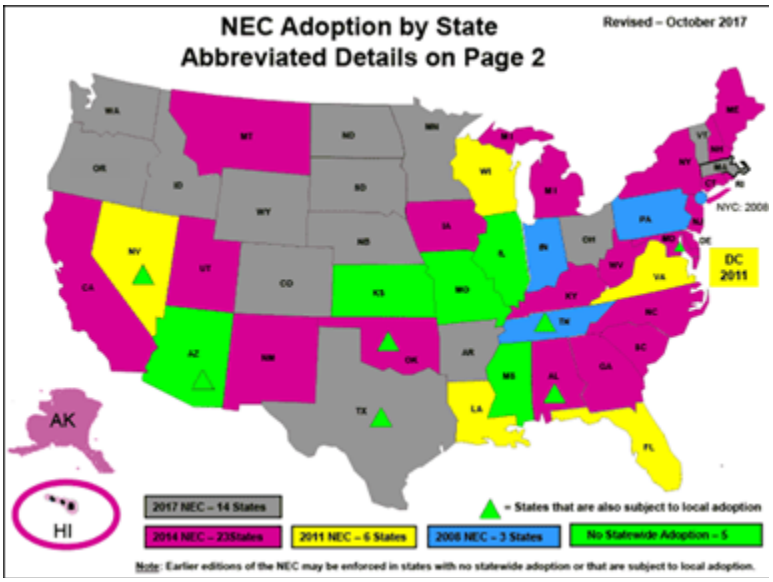
Table: Revenue Ranking of Top 10 LED Package Suppliers in Chinese Market, 2015~2016

Ranking	Top 10 for 2015	Top 10 for 2016	Change in Ranking
1	Nichia	Nichia	→
2	Lumileds	MLS	↑
3	MLS	Lumileds	↓
4	Everlight	Everlight	→
5	OSRAM Opto	OSRAM Opto	→
6	Lite-on Technology	NationStar	↑
7	NationStar	Lite-on Technology	↓
8	CREE	Honglitronic	↑
9	Honglitronic	CREE	↓
10	Seoul Semi	Seoul Semi	→

Source: LEDinside, Jul., 2017

National Energy Market Observer:

25. **Adoption of the National Electrical Code®**- The National Electrical Code® (NEC) is the preeminent electrical installation code in the U.S. However, the NEC takes on real significance when it is adopted into law by states and local jurisdictions. The timing for code adoption varies by locale and may be amended by state and local jurisdictions. The result is that different electrical codes are being enforced in different parts of the U.S. NEMA's Field Representatives track the adoption of the NEC in their respective territories and have developed a report that identifies which electrical codes are enforced where. Download at: https://www.nema.org/Technical/FieldReps/Pages/National-Electrical-Code.aspx



26. **Get to Know Electricity Supply Rates in Your State** - In recent years, many states have adopted a deregulated energy market that allows residents to shop for the supply portion of their energy rather than automatically getting it from their utility – a right known as energy choice. Deregulation changed the world of energy, which is reflected in price differences across regulated and deregulated energy markets. Here, we've compiled data to show you just how much energy costs can vary, including historical energy supply prices from the U.S. Energy Information Administration (EIA) in all 50 states. Information on recent rates and fluctuations may help you understand your bill or decide to change your energy supply plan. Enter your ZIP code to monitor your rate at: https://www.chooseenergy.com/electricity-rates-by-state/

27. **Massachusetts Still Tops State Energy Efficiency Ranking** - The 11th annual report from the American Council for an Energy-Efficient Economy (ACEEE) shows which states are doing the best on energy efficiency — a critical tool for withstanding and recovering from storms and economic shocks. Massachusetts broke its 2016 tie with California by holding on to the No. 1 ranking, while the Golden State slipped to No. 2. As national leaders, Rhode Island, Vermont, and Oregon round out the top five in the ACEEE Scorecard. Idaho posted the most gains by far in 2017, surging past a number of mid-ranked states in ACEEE's comparative index of efficiency policies, best practices, and other metrics. Idaho advanced seven spots, from 33rd to 26th place. The balance of the 10 most-improved states are Virginia, Oklahoma, Florida, Utah, Nevada, Louisiana, Oregon, Washington, D.C., and Kentucky. https://facilityexecutive.com/2017/09/massachusetts-still-tops-state-energy-efficiency-ranking/

Monthly Feature:

LED Bulbs Have Turned into Multi-Functional Gadgets -

With fast advancements in LED technology, a simple LED bulb is no longer just a source of lighting—it has become a multi-functional gadget that can connect with the web, influence human behavior, work with sensors and much more. At present, the lighting industry has shifted from the traditional filament lighting to electronic systems. This has opened up numerous opportunities to develop smart and connected lighting systems. Today's LED lighting systems can be embedded with smoke detectors, heat sensors, cameras, speakers, etc. However all such additional facilities come with a price.

New smart LED lighting systems

With the demand for smart LED lighting rising across the globe, companies are coming up with new offerings to fulfill the needs of the users. Enlighted Inc has come up with appealing developments in smart lighting systems, particularly for the retail sector. The company has incorporated sensors within lighting system, which helps to track movement of customers around a retail space. This will help the retailers to gain critical feedback of their consumers, points of sale (POS), consumer behavior, etc.
For office applications, LED lighting vendors have brought about user-friendly and user-focused systems. For instance, the desks of an office can control individual lighting, as a result, and staff member can dim individual lights up or down through a desktop or his/her smartphones.

These desk clusters can change the lights to imitate the natural daylight. This eventually, influences the circadian rhythm of the staff members. In the evening, they can make the lights warmer, allowing the release of melatonin and preparing the body to rest. These functions are possible with the help of intelligent lighting controls and sensors, which also help to save energy.
LED technology such as cloud-based lighting opens up an array of opportunities for facility management. For instance, a hotel has numerous light points. A two-way control system can communicate with the maintenance team if a downlight in a guest room toilet has failed, without the need to perform regular inspections.

In addition, the system can collect information about a user's behavior. For instance, a corridor that dims down after 10 minutes of inactivity could ultimately be adjusted to five on the basis of the usage pattern. This means that at the end of the year, those five minutes will symbolize hours of energy saving.

Activity-based lighting

LED is about activity-based lighting, which refers to having light where it is absolutely necessary. For instance, daylight sensors help in measuring the actual daylight inside the room and then regulate the artificial light to ensure outstanding visibility.

Such sensors can accurately monitor any walking or driving motion with ceiling heights up to 20 metres, making it perfect for application-specific solutions in which high energy efficiency is of key importance.
vvv

Advanced fittings

Not only lighting systems are getting more efficient and smart, the fittings are equally smarter and efficient. Since LED is a controllable and manageable component, fittings can now adapt to severe weather conditions, and guarantees high performance. The smart lighting fittings react extremely well to diverse conditions and can withstand adjustments in intensity.
http://bizled.co.in/led-bulbs-have-turned-into-multi-functional-gadgets/