INDIA'S FOREMOST MAGAZINE ON THE LIGHTING INDUSTRY

Lighting India

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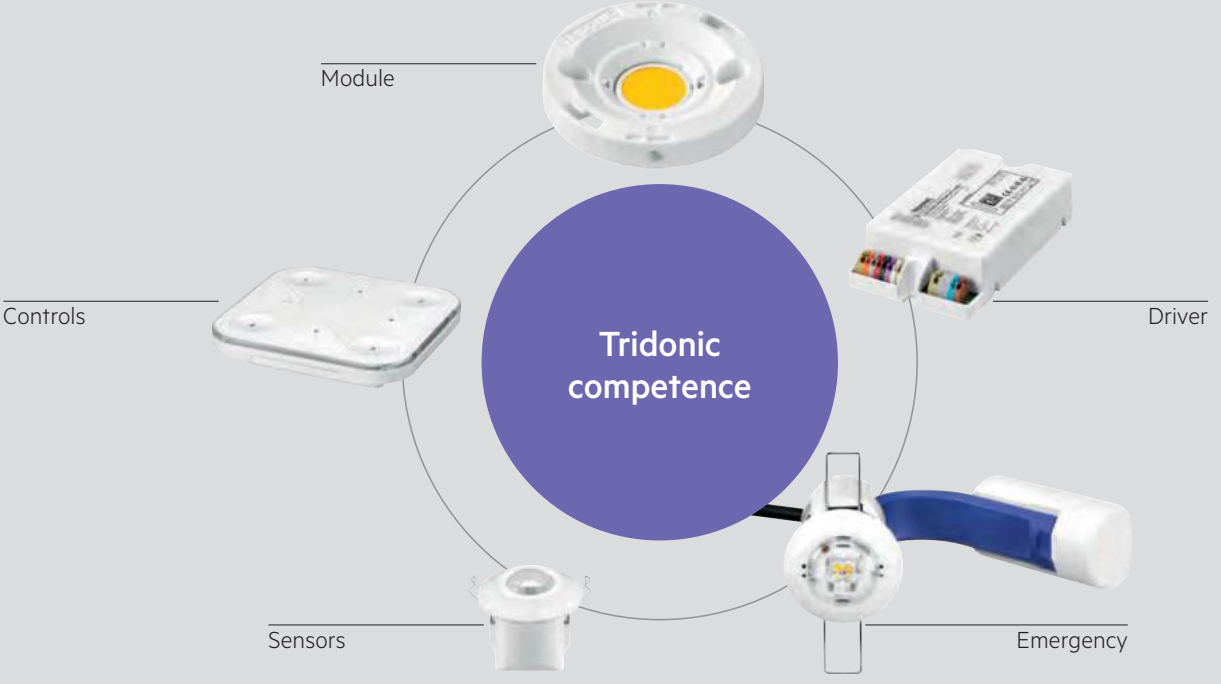
LED solutions

Keeping the details in mind and the system in sight.



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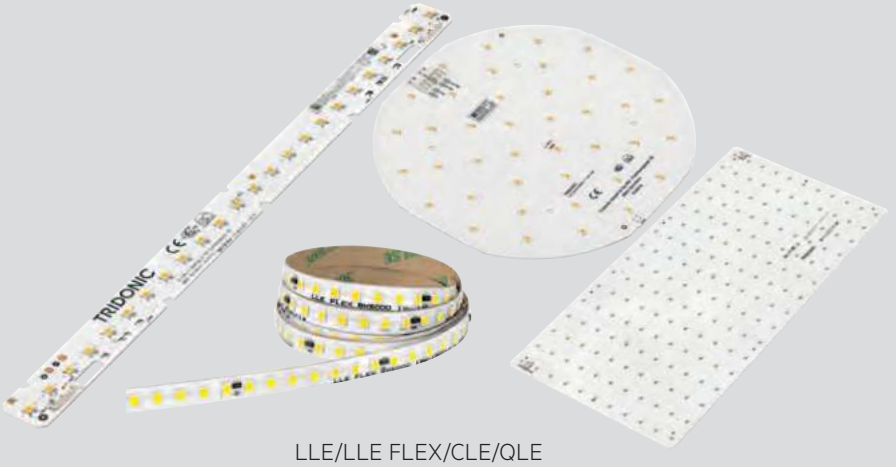

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Industry

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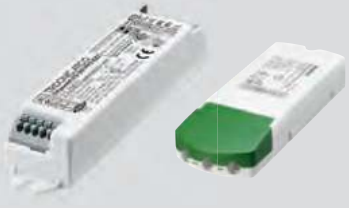
Emergency lighting units



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Recessed Emergency Downlight

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From the Publisher's Desk

Although the focus on energy saving and mood creation in lighting designs was drawn years back, beyond a certain extent translating thoughts into actions was not possible at that point of time. In the last one decade or so, a vast change has occurred in the field of sensors. Different kinds of them, including ambient light sensor, proximity detection sensor, RGB colour determining sensors, gesture recognition sensors and UV/IR detection sensors are readily available today. Also, their sizes have reduced remarkably. One more interesting development in the field is the advent of multifunctional all-in-one sensors. These sensors are capable of sensing lighting levels, occupancy levels, temperature, humidity, air quality, sound and positioning of objects very accurately.

On the other hand, vast technological improvements of the LED-based lamps and development of signalling technologies like Bluetooth, IR etc., have made it possible to integrate individual lamps to create a vast network of communicating lamps and control them. Thus, the concept of smart lighting with smart lamps is all set to change our activities.

Besides serving the very basic purpose of colourful illumination, today's LED lamps are getting involved in many of our day-to-day activities. A modern lighting system also involves Internet of Things (IoT). IoT facilitates seamless communication among the lamps and their controllers. Although the word Internet is being used here, an LED lamps' network does not always require Internet for effective control. Once connected to Internet, the lights can be operated from any of the outdoor positions – literally from one pole of the world to the other pole.

Mahadevan

Publisher & Editor-In-Chief

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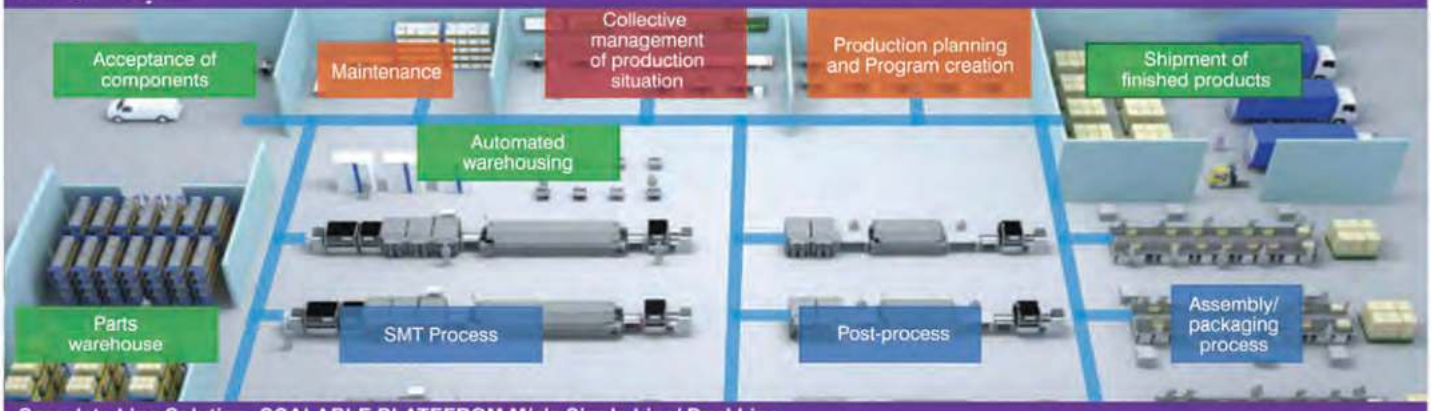

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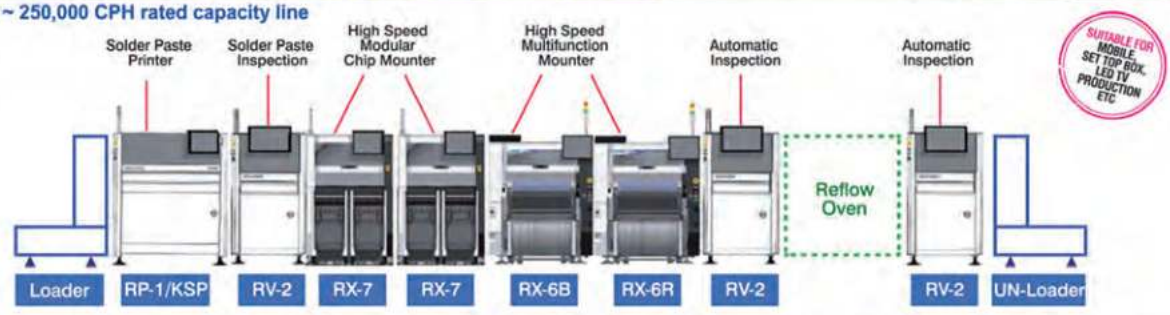

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New York's ESB Observatory Reopens

The observatory of the Empire State Building (ESB); the world's first 100 + story building whose lights were first turned on May 1, 1931; has been again opened up for public and operating following government's new regulations...

The unprecedented July 4th Macy's Fireworks finale...

The iconic monument from New York, Empire State Building (ESB), which was kept shut down for quite a while, has again opened its doors for visitors from July 20, 2020. Employees in the world-famous observatory have been trained to handle the new protocols under New York State's Phase 4 guidelines.

The initial visitors' capacity has been reduced by more than 80% to only 500 guests in the observatory's 70,000 square foot space at a time, and well below the 25% capacity guideline set forth in Phase 4.

During the COVID-19 pandemic The Empire State Building cemented itself as a beacon of hope and inspiration through its 'Pandemic Siren' and 'Heartbeat of New York' lightings, the international "Heroes Shine Bright" campaign honouring First Responders, and the music-to-light shows with Alicia Keys, The Beatles and Billy Joel, which generated more than 33.2 billion media impressions in four major markets measured worldwide. The unprecedented July 4th Macy's Fireworks finale at the Empire State Building was the prelude to its reopening and showcased the enduring Icon of New York City. ■

GE Lighting to Maintain its Identity Even after Acquisition

Savant Systems, a Massachusetts-based company, is a recognized leader in home control and automation, and one of the fastest-growing smart home companies in the luxury and mid-markets. The company will continue to invest heavily in the development of the most advanced lighting products...

Robert Madonna

GE Lighting, now a Savant company, will continue to maintain its headquarters in the same historic NELA Park in East Cleveland, Ohio. Also, Bill Lacey will continue to serve as its President. Savant Systems, Inc. (an industry leader in the professional smart home space) has completed the procedures of acquisition of GE Lighting; however, under a long-term licensing agreement, the company will continue to use the GE brand on its products.

Focusing on their future plan, Robert Madonna, CEO of Savant and GE Lighting, a Savant company, said, "We are committed to ensuring that Lighting's long history of industry leadership continues, while bringing exceptional value and reliability to retail partners and consumers. This acquisition has moved our company significantly toward our goal of becoming the number one intelligent lighting company worldwide."

The Savant brand remains steadfastly committed to the professional installation channel for the home, and it will continue to invest heavily in the development of the most advanced products, solutions and services for this market. ■

UV-C lights Cabinet Launched to Fight COVID 19

UVSD Cabinets can disinfect a large number of things including N95 masks; Disposable cloth or homemade masks; Cell phones; Tablets; Keys; Cash money; CPAP/ Respiratory Equipment; Remote Controls and so on...

The portable XSF Sanitizer Cabinet...

In an effort to be part of the fight against Covid-19, and considering that the gig industry is currently on hold, Xtreme Structures & Fabrication (XSF) has transitioned from manufacturing aluminium truss to stainless steel Sanitization and Disinfection Cabinets.

The XSF Sanitizer Cabinet is a portable cabinet equipped with UV-C lights that kills up to 99.9% of bacteria and germs including Coronavirus, Staph infection, the common flu, and pneumonia on any items placed in the chamber in just 5 minutes. The cabinet includes hanger bars and hooks to suspend items for full 360-degree disinfecting.

The stainless steel XSF Sanitizer Cabinets come in three sizes and can be used to disinfect a wide variety of items including masks, tools, utensils, toys, handheld radios, Clip boards, Lab or kitchen utensils, Electronics, Items regularly handled by patients, employees, or customers, Office supplies – mouse, calculator, pens, keyboards, etc., Lab coats, Hats, Gloves, Shoes, Work clothes, Baby bottles & supplies, Children's toys, Handheld Scanners and other items that can be placed in the cabinet. ■

Virgin Galactic Puts Mood Lighting in Commercial Spacecraft

Maintaining the mood of the astronauts during space travel is very important – as once boarded in the spacecraft, they cannot come out even through emergency landing that is possible from aircraft. So, Virgin Galactic has taken into consideration that aspect while designing VSS Unity...

A view of the interior of SpaceShip Two vehicle, VSS Unity...

Comfort of the space travellers is very important because there is no other chance of relaxation. Keeping this important thought in view, Virgin Galactic Holdings, Inc., a vertically integrated aerospace and space travel company, has revealed the cabin interior of its first SpaceShip Two vehicle, VSS Unity through a live streaming on You Tube.

Designed by Virgin Galactic in collaboration with Seymourpowell of London, the SpaceShip Two vehicle has included very special lighting and allied design. The colour palette of the cabin has been carefully curated — so that it complements the architecture of the seat, the cabin itself and spacesuits. The golden metallics resemble luminous desert sands, blues conjure celestial spaces and teals inspired by the ocean ground travelers back to earth.

Virgin has pioneered mood lighting on its commercial aircraft, and that idea has been translated by Virgin Galactic, into the new era of commercial spaceflight. Multi-colour LEDs are concealed within the "Halo" window surrounds and are used to subtly reflect back and therefore elevate, the human responses to each of the contrasting stages of flight. At the pinnacle of the experience, as the Earth comes into view against the black sky of space, all lighting is extinguished, bringing an instant focus to the profoundly beautiful vista. ■

Fluence Leads a Global Research Initiative

The ongoing multi-country and multi-crop initiative advances Fluence's and the greater horticultural industry's understanding of the interaction between light and life...

Researchers at Proefstation study cucumber production under Fluence LED solutions...

Fluence has recently expanded its global photobiology research program, which encompasses studies on multiple vine crops, leafy greens and medical cannabis in the United States, Canada, Germany, Belgium and the Netherlands.

The company leverages a network of leading research institutions and partners for its program, including Wageningen University & Research (WUR) for tomatoes; Proefstation voor de Groenteteelt (Proefstation) to study cucumbers; Harrow Research and Development Centre for peppers; The Technical University of Munich's Greenhouse Lab Centre for lettuce; Wageningen Plant Research's Greenhouse Horticulture business unit and Compassionate Cultivation for medical cannabis. The latest studies utilized Fluence's VYPR Series top light and expanded PhysioSpec spectra. ■

MaxLinear's G.hn Technology Powers Smart Cities

Technically, a device installed in each streetlight, grouping all nodes into a network based on the existing outdoor lighting infrastructure. A broadband powerline communication solution is enabling aggregation of different technologies (Wi-Fi) in one single system. A gateway installed in the electrical cabinet controls all nodes in a segment...

MaxLinear Inc., a leading provider of Radio Frequency (RF), analog, digital and mixed-signal integrated circuits, has added another feather to its cap as UVAX has selected a MaxLinear G.hn Wave-2 chipset to develop solutions for Smart Cities.

Focusing on their current activities, Antonio Royo, Chief Executive Officer at UVAX, said, "UVAX solutions are driving interconnectivity as a powerful tool for offering better services and lifestyles to citizens. By adding MaxLinear G.hn technology to its innovative solutions for Smart Cities, UVAX builds on a strong G.hn backbone for powering the outdoor lighting network of the city. We are converting the underutilized public lighting infrastructure into a data highway to interconnect thousands of sensors and IP devices and aggregating them into a TCP/IP system with remote control features."

Complimenting the combined effort, Will Torgerson, Vice President & General Manager of MaxLinear's Broadband Group, said, "MaxLinear is delighted to see its world-renowned G.hn technology implemented in the future-proof grid of the Smart Cities. The G.hn-based UVAX solutions will set up an energy efficient platform for Smart Cities of the future allowing a whole new range of applications to be built on the robustness of G.hn technology.

Scalability and remote control are key advantages of the UVAX solution, enabling gradual integration of IP products ranging from security devices to adaptive lighting, information panels and highway safety signs. ■

Hella Rolls out New Headlamps for Trucks

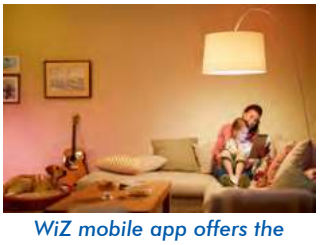
The Jumbo LED is tested according to the new ECE regulations (ECE R149 high beam, ECE R148 position light, ECE R10 EMC). The auxiliary high beam headlamp is supplied in the illumination variant ECE Ref. 25 and is ideal for mounting on a roof bracket...

Increasing road safety and maintaining an overview in every driving situation - the demands on vehicle lighting in commercial vehicles are high. In addition, the individual appearance of vehicles is becoming increasingly important. Against such a backcloth, HELLA has recently launched a new set of full LED auxiliary headlamps from the Jumbo series, which has been well-known for decades.

The new Jumbo LED auxiliary high beam headlamp combines function and design in one product. The highlight is the striking LED position light, which presents itself in the form of a friendly smile. When switched on, the light signature with the high recognition value presents a characteristic lighting design both during the day and at night. This is ensured by the EdgeLight technology that HELLA has transferred from the automotive sector. ■

WIZ Facilitates Lighting Control Based on Circadian Rhythm Settings

The WiZ app's interface is user-friendly and intuitive with an easy drag and drop system to organize and control lights and accessories. Pre-set scenes and routines simplify daily living and help consumers to find the perfect light setting for any moment of the day...



WiZ mobile app offers the opportunity to let multiple users manage the lights with different permissions...

Addressing the long-awaited need for affordable smart lights and accessories that are easy to set-up with Bluetooth and the user's existing Wi-Fi network, Signify has recently launched the latest generation of the multi-protocol WIZ smart lighting system in Europe. The addition of the WiZ system seamlessly fits to the company's mission to let consumers feel the magic of light through accessible smart lighting products that are intuitive in use.

The WiZ Connected portfolio includes lights and accessories that are very easy to install and enable consumers to instantly experience the perks of smart lighting. Just screw in the new WiZ light, download the intuitive WiZ mobile app and directly start to enjoy the lights. The newest products come with Wi-Fi and Bluetooth dual protocol chips which make the pairing process even easier and more reliable. In the near future, Signify will roll out this great feature to the full WiZ product range. Via different modes, consumers can easily set the perfect light to study, create a cozy setting by mimicking a fireplace or candlelight, and automate and synchronize lights with daily activities or schedule lights to smoothly wake you up or support your bedtime routine. ■

Aviva Stadium Offers Special Entertainment Experience

Since 1976, Musco has specialised in the design and manufacture of sports and large-area lighting with innovations in light quality, glare reduction, and light control responsible to the needs of facility owners, users, neighbours, and the night sky...

After installation of its state-of-the-art LED technology as the new field-of-play lighting system at the stadium, Musco has added a new life to the Aviva Stadium of Dublin, Ireland. The newly-installed system includes 52 colour-changing, red-green-blue-white (RGBW) LED fixtures strategically located throughout the stadium's bowl to illuminate the roof structure. Additionally, bracketing and cabling for two dozen spotlight mounting locations were installed, which will allow for temporary, moving spotlights to be added on an as-needed basis.

Elaborating on their plan, Martin Murphy, Aviva Stadium Director, said, "Advances in technology are helping venues to merge sport and entertainment. At Aviva Stadium, we want to accentuate the drama of our events. Our new lighting effects will enable us to build a sense of anticipation before games by adding to the pageantry. The external visual impact is spectacular and draws attention to the stadium, reminding everyone in town that a big event is taking place."

As with the field-of-play lighting, the new entertainment lighting was installed by McSherry Electrical and the lighting controls were designed and integrated by StadiumFX. The system is capable of delivering an exciting range of colour-changing special effects scenes and light shows. ■

Turner Construction Buys Heliospectra's LED Lighting Solutions

ELIXIA uses primary and secondary optic lens plates to achieve uniform light intensity and maximum light distribution across a growing area...

Heliospectra LED grow light system controlled via web interface optimizing plant growth to save up to 50% energy...

Turner Construction from Miami, Florida, United States, a leading designing, construction and installation service provider has recently placed an order worth USD $270,000 with Heliospectra AB. Accordingly, Heliospectra, the world leader in intelligent lighting technology for greenhouse and controlled plant growth environments, will supply their LED Lighting Solutions for Upcoming Greenhouse Projects of Turner Construction.

Contextually, Heliospectra was founded in 2006 in Sweden by plant scientists and biologists with one vision – to make crop production more intelligent and resource-efficient. Today, with customers across six continents, Heliospectra is the global leader in innovative horticulture lighting technology, custom light control systems and specialized services for greenhouse and controlled plant growth environments.

The company's new 600W high voltage ELIXIA fixture, is an addition to its high voltage product portfolio – and caters to growers with industrial electrical standards around the world. Developed with leading greenhouse growers in North America and Europe, the new fixture delivers a high-quality light spectrum and output for high-light food crops and cannabis. ELIXIA is fully controllable using Heliospectra's helioCORE light control system, designed for growers demanding control and automation in their greenhouse or indoor growth facility. ■

Delta Light Receives Silver Medal from EcoVadis

EcoVadis, a leading and independent industry monitor for sustainability in global supply chains, has recently awarded a Silver Medal to Delta Light for its on-going efforts in sustainability and Corporate Social Responsibility (CSR).

EcoVadis assesses companies on 4 themes: environment, labour & human rights, ethics, sustainable procurement. Delta Light exceeds the industry average in each theme, scoring particularly well in labour & human right and ethics.

A B/W image of the silver medal obtained by Delta Light...

The EcoVadis report applauds to Delta Light's 100% renewable energy and waste management policies. The report also praises Delta Light's efforts in providing a healthy, safe and balanced environment for all employees. The Silver Medal (by EcoVadis) confirms Delta Light's position as a frontrunner in the lighting industry in corporate social responsibility. EcoVadis' assessment chapter on sustainable procurement focuses on the evaluation of suppliers on their efforts in CSR and on purchasing policies. Among other actions, Delta Light has sustainable procurement policies in place that cover environmental and social factors. ■

UL to Facilitate Advance LED Lighting Innovations

UL helps create a better world by applying science to solve safety, security and sustainability challenges. Now, the company will help Digital Illumination Interface Alliance to test and certify global LED drivers, control gears and device interoperability and compliance...

DALI test house light image...

UL's lighting laboratory in Carugate, Italy, located in metro Milan, has received accreditation from the Digital Illumination Interface Alliance (DiiA) to be a Digital Addressable Lighting Interface (DALI) protocol test house. As an international standard for a two-way communication system that brings digital technology to lighting, DALI defines the commands that LED drivers and ballasts need to recognize in order to communicate via controllers and computers equipped with appropriate software or building management systems. With the DiiA accreditation, UL now has the ability to test control gears and devices, such as push-buttons and occupancy and light sensors, against the DALI standard.

DALI, as a recognized industry-standardized protocol, is specified in the international standard IEC 62386, as well as by new specifications written by DiiA, including DALI-2. DALI-2 is the second generation protocol based on the 2014 restructuring of the IEC 62386 standard that included the addition of application controllers and input devices.

With the DALI-1 registration requirements ending Dec. 31, 2019, new specifications in DALI-2, including bus timing and bus power, the interoperability between multiple vendors is improved. ■

IoT INFUSED Lighting

Artificial lights were developed to make things visible in the absence of natural lights. However, the invention of Smart LED lamps coupled with the advent of IoT has vastly widened the functional portfolio of the modern lighting systems. Today's IoT-backed Smart Lighting Systems provide much more than just illumination...

- P. K. Chatterjee (PK), Editor

When in 1800, Alessandro Volta connected a copper wire between the two ends of his groundbreaking pile of alternating discs of zinc and copper — interspersed with layers of cardboards soaked in salt water, the copper wire started glowing, the history of science recorded the phenomenon as the first indication of electric current generation in laboratory. However, a little consideration makes us understand that it was also the first ancestor of the incandescent bulbs, which were much improved – and later in 1879 patented by Thomas Alva Edison as the first commercially successful electric bulb.

Although it was an epoch-making invention at that point of time, perhaps not even the wisest of the scientists then could even dream of a lamp that could communicate with users, other equipment in the circuit and the devices or actuators around – that too without a connection established through a conducting wire. But today it has been possible.

Smart Lighting Systems (SLSs)

I believe it will not be an exaggeration to say that we live in the Smart Age, because now literally everything is smart around us. We are planning for Smart Cities, where Smart Buildings will be equipped with Smart Gadgets, in which Smart Lighting will play a leading role. Then we all need to know what exactly Smart Lighting means.

To put it in the simplest way: a smart light is an LED lamp having an embedded software to help it connect to an app or smart home assistant or other smart accessory, so that it can be operated remotely. Now the question arises, what can be done through such remote control?

As two or more such bulbs are connected to a Network, they can be switched on /off, dimmed or colour-changed remotely – no wall mounted switches are required. They can be operated with the help of a computer or a hand-held device like a smartphone or tab.

Contextually, it must be understood that Smart Lighting Systems can be deployed at indoor as well as outdoor areas. They may be used to make a saloon colourful, at the same time their application is possible on a road – (say) for example when traffic is there the intensity of illumination increases and vice versa. However, as Will Gibson; Founder and Chief Commercial Officer at Telensa, a technology company delivering the world's largest smart streetlight control systems; rightly points out, "The outdoor lighting controls market is fragmented, with many

vendors having a limited deployment footprint. We know the industry is looking for resilient turnkey solutions that are proven at scale and with the largest city and utility lighting networks."

IoT- backed SLSs

Nowadays, we all are aware of the latest market buzz IoT (Internet of Things). As per Wikipedia IoT refers to: "A system of interrelated computing devices, mechanical and digital machines provided with unique identifiers – and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction."

Obviously, such a system is a boon to the Smart Lighting Systems, because it can be a great source of data collection and action. For example: if a speaker (night) lamp is connected through IoT; depending on the number of people in the room, their average distance from the speaker and (say) the time in the clock or beginning of their sleeping hour; the lamp may increase or decrease the volume of the speaker automatically as per the requirement. In the later part of the article, I will focus on some of the recent projects that will explain the huge potential of IoT in smart lighting industry.

Growth Potential & Current Trends of SLSs

Towards the beginning of this year, a research report from Research And Markets indicated that "Global Smart Lighting Market is estimated to grow from USD 13.4 billion in 2020 & and projected to reach USD 30.6 billion by 2025, at a CAGR of 18.0%."

The report also points at some notable trends including: i) Government initiatives and policies for energy savings to drive the growth of smart lighting market; ii) Wired technology is expected to hold a larger share of the smart lighting market by 2025; iii) Highways & roadways to hold the largest size of smart lighting market for outdoor application during the forecast period; and iv) Smart lighting market in APAC is expected to grow at the highest CAGR during the forecast period.

The report was published during the initial days of Covid 19 spreads, so the scenario has changed a bit now. However, as people all over the world are now confident of getting Covid 19 vaccine that is expected soon, the momentum is expected to be regenerated within a few months.

Will Gibson
Founder and Chief Commercial Officer at Telensa

Photo by Guido B. Wikimedia Commons

A voltaic pile on display in the Tempio Voltiano...

Photo by Signify

Controlling smart lights using a smart phone...

Photo by Ring, LLC

Ring PAR38 floodlight smart bulb...

An important point to be noted here that according to Research And Markets' observation, "This growth is attributed to rapid infrastructure building activities being undertaken in APAC, mainly in China and India, where Smart Lighting paves the way for the modernization of infrastructure. The modernization and development of infrastructure such as Smart Cities across the region, coupled with government policies to support energy-efficient lighting, would also drive the demand for Smart Street Lights (automatic switch on/off, high or low lumen distribution based on street-traffic), thereby driving the market for Smart Lighting in this region.

A Few Recently Launched Devices

As said earlier that Smart Lighting has been the latest buzzword in the market, a plethora of Smart Lighting products are available today and more are coming. Within the small span of this article, I cannot describe all of them, however, I will talk here about some arbitrarily chosen ones.

Signify has recently announced several new and updated Philips Hue products, which will bring a new perception to our cooking and dining experience, enabling us to highlight specific objects. The new and updated products include a brighter standard bulb, a new family of indoor ceiling fixtures, an updated Philips Hue lightstrip, an updated Philips Hue Bloom, and additions to the Bluetooth-capable Philips Hue White ambiance indoor range of fixtures.

With a view to providing more consumers with enhanced smart home options, GE Lighting has recently added several new C by GE technologies to its ever-expanding portfolio of smart home products. Advanced lighting switch and dimmer technologies, as well as new comfort, safety and security solutions, have been designed to integrate and interact with existing C by GE products to provide an easy-to-use, improved and more complete smart home network. The same set of products will be launched for retail stores later this year. All these new products that extend beyond the lighting space can be operated through a single mobile application that is very simple to install, use and maintain.

Ring has entered 2020 with a robust lineup of security devices, and the company will continue to focus on innovating new products – while enhancing its customers' experiences especially around privacy and user control. The company is now enabling its customers to upgrade their indoor lamps and outdoor light fixtures with Smart LED Lightbulbs.

Photo by Delta Electronics

Delta Smart Street Lights make a Smart City Blueprint for Jakarta...

Photo by GE Lighting

GE Lighting has launched its first ever Home Innovations and New Program in CES 2020...

Photo by Semtech

KEC has built a network based on Semtech's LoRa devices and the LoRaWAN protocol for its expressways...

Photo by Osram

Lighting Solutions by Osram in the media center of Shenzhen World...

These Smart LED Lightbulbs create a complete network of security lights in and around the home. Ring's first-ever line of Smart LED Lightbulbs launched with two styles: the A19 Smart LED Bulb, great for inside areas of the home and outside in protected areas, and the PAR38 Smart LED Bulb, ideal for both indoor and outdoor use. With these new, Alexa-enabled Smart LED Lightbulbs, Ring users can now use the Ring Bridge to group and control the Smart LED Lightbulbs – remotely turn their lights on and off, adjust the brightness, and set schedules right from the Ring app. And when linked with other Ring security devices with motion sensors, the Smart LED Lightbulbs can be set to turn on when any motion is detected.

Brief on a Few Current Projects

According to the information from Semtech Corporation, Korea Expressway Corporation (KEC), a government affiliated company building and managing expressways in South Korea, has built a network based on Semtech's LoRa devices and the LoRaWAN protocol for its expressways as the first stage in its ongoing four-year Internet of Things (IoT) deployment plan in the country.

Gil Quiniones
President
& CEO, NYPA

The New York Power Authority (NYPA) has partnered with Signify, the world leader in lighting, to support Smart Street Lighting NY, a statewide program that calls for at least 500,000 streetlights throughout the state to be replaced with energy-efficient LED technology by 2025. Through the program, NYPA provides financial, logistical, technical and informational support for cities that want to upgrade their street lighting systems.

Commenting on the versatile benefits of Smart Street Lighting, Gil Quiniones, NYPA President and CEO, said, "In addition to illumining roadways, street lighting systems are essential vertical assets in smart city deployments. Municipalities can save money on their utility bills and maintenance costs by adopting connected LED lighting while leveraging the value of their street lighting systems for additional benefits."

Shenzhen World serves as a venue for events and has space for restaurants, shopping and offices. With a total area of around 1.48 million square metres, including 500,000 square metres of indoor space, Shenzhen World has broken eight world records as the world's largest exhibition and convention centre. Recently, Osram has developed an extensive interior lighting solution for this extraordinarily complex and large building. To illuminate the entire venue evenly, the Osram installation has taken full advantage of daylight and arranged lighting in such a way that it meets the special needs of the individual areas. More than 100,000 indoor LED fixtures have been installed in over ten indoor areas, such as the multifunctional hall, the media centre, the ballroom, the international lecture hall and the stadium, to create modern rooms with ideal lighting.

Conclusion

As a recent survey of Research And Markets points out, some prominent factors like: Growing demand of Street Lighting Systems, Increasing need for Energy-Efficient Lighting Systems and High penetration of LED bulbs & lightings globally will continue to push the demand of Smart Lighting Systems (SLSs). Internet of Things (IoT) will facilitate further integration and robust Networks of Smart Gadgets will be the most common feature of the Smart Buildings of the Smart Cities of the forthcoming Smart Days. However, for economically less privileged societies High Installation and Maintenance Cost in Smart Lightning Systems will be a challenge.

As an emerging business segment, Smart Lighting will definitely gain mileage from the emergence of IoT & AI Technology and growing developments in Smart City Projects, especially in APAC will promote and popularise its application manifold. ■

Photo by Scott Webb on Unsplash

SIGNIFY TO ACCELERATE THEIR LIGHTING RANGE WITH TECHNOLOGY AND INNOVATION

Sumit Joshi, Vice Chairman and Managing Director, Signify India provides a gist to Abegail D'mello about his company's innovative designs build to deliver world-class lighting systems, embedded with intelligence and connected through software that enables end-users to manage, monitor, and control lighting assets to improve lighting operation and business performance.

Tell us in brief about Signify. What are the steps taken to accomplish your mission of unlocking the extraordinary potential of light?

Signify is the world leader in lighting for professionals, consumers and lighting for the Internet of Things. Our energy-efficient lighting products, systems and services enable our customers to enjoy a superior quality of light and make people's lives safer and more comfortable ensure that businesses are more productive and cities more livable.

We unlock the extraordinary potential of light for brighter lives and a better world. We achieve this through living our values, innovation, passion for sustainability and desire to transform people's lives. We have always focused on innovation, creating new products and services for the benefit

of consumers. We spot a problem, which nobody focuses on and grow in that segment by developing groundbreaking and futuristic solutions. For more than 125 years, we have pioneered breakthroughs in lighting and been the driving force for many innovations.

Signify continues to innovate in LED lighting and is leading the industry's expansion to lighting systems in both professional and consumer markets. Our position as the industry leader in connected lighting makes Signify the lighting company for the Internet of Things (IoT). We have already installed millions of connected light points worldwide. This growing number of connected light points, sensors, and devices, as well as systems, can collect large volumes of data that our offering Interact was designed to handle. The highly secure, scalable cloud-based Interact platform uses sophisticated and modern data management and data processing capabilities, including machine learning, to bring sense to all manner of data – creating data-enabled services for customers that will deliver benefits beyond illumination.

We are also investing to broaden our UV-C lighting portfolio to meet the growing demand for disinfection. The company is launching 12 families of UV-C-based products for professional markets (B2B) and has recently launched a UV-C disinfection system for the B2C market. By increasing capacity and broadening the UV-C portfolio, we are trying to help keep people safe in a world that's adjusting to a new normal.

Elaborate on the R&D sector of your products. How are you coping-up with producing economic products without compromising on the quality?

Signify has been the driving force for many innovations in the lighting industry as we invest heavily in R&D to stay at the forefront of technological developments. We invested 4.5% of our global sales in R&D. We have also established large global R&D units, in Bengaluru and Noida, to work on emerging lighting technologies not just for India but also for global markets. As a result, we design and manufacture more than 98% in India of what we sell in India, which helps us produce economical products.

Tell us more about your horticulture lights and the flexibility of its fixtures to make fixing effortless.

Growing demand for high quality, fresh and organic food and an increasing interest in sustainable farming solutions in countries with arid climates such as India... have resulted in an increased interest in indoor farming techniques that use horticulture lighting solutions for growing plants. Furthermore, because of its economic feasibility and ability to serve as a possible solution to India's dwindling availability of fertile soil or clean and surplus water, this practice of agriculture resolves around many of the issues challenged around the year. Combined with drought conditions and the vagaries of global warming, Indian agriculturalists are fighting a drastic reduction in the availability of locally grown food for India's large and ever-growing population.

With cutting-edge LED innovative technologies at our command, we can custom-build a science-based solution for different horticulture application areas. We do not provide mere lighting, but also provide 'unique light recipe' suitable to the application developed through our research and global experience. Our light recipes are suitable for different segments within horticulture, e.g. vegetable production, tissue culture, young plant production, cut flowers, seedlings, and nurseries. Tailor-made light recipes mean faster growth, bigger harvests, and higher quality plants. Having completed hundreds of projects on a range of crops, Signify Horticulture LED solutions is offering knowledge of Horticulture LED lighting solutions around the world.

GreenPower LED Toplighting: Delivers a high light output while radiating less heat. It means light and temperature can be controlled separately from each other to gain more control over growing conditions. Combined with our dedicated light recipes opens new opportunities for every greenhouse grower to increase their quality and yields and move to year-round production. Toplighting shortens growth cycles, increase yields, reduce energy usage, and enable more economic use of space.

GreenPowerLED Production Module: Specially designed for vertical growth systems, the best solution for new or existing installations. Due to its high energy efficiency and long lifetime, and is a cost-effective way to improve climate and crop control for indoor cultivation environments. Optimized for closed, climate-controlled cultivation facilities, such as city/vertical farms, propagation, and research centers that use multilayer growth systems to grow crops such as lettuce and other leafy greens, soft fruits, herbs, and young plants.

GrowWise Control Systems: Allows growers and researchers to easily create and run custom LED light recipes to meet the needs of specific crops to improve quality, productivity, and efficiency. It can be used as a standalone system or integrated into a climate or logistic computer system to steer specific plant characteristics, from compactness, colour intensity, and branch development to flowering and more to improve results.

Brief us on your innovation of Li-Fi and how best are you using IoT across your light product? How do you justify your innovation with constant development in the R&D scenario?

Light Fidelity (Li-Fi) is a technology in which high quality LED lighting provides a stable and fast broadband Internet connection through light waves. Unlike other forms of wireless communications (e.g. WiFi, 4G/5G, Bluetooth, etc.) that use radio waves, Li-Fi uses the broader spectrum of light waves to transmit and receive data wirelessly and its bandwidth is more than 1,000 times the size of the radio spectrum. Satisfying all

the requirements of this digital day and age, Li-Fi is a perfect fit for financial institutions, government, and public offices that demand a highly secure and fast internet connection.

Data transmission over the light spectrum is the latest buzz in the world of lighting, as the radio spectrum is becoming congested and is also susceptible to cyber intrusions. The light spectrum is quite wide and underutilized as we're using it so far only for lighting purposes, but through Li-Fi light waves can also be used to transmit data and connect devices more safely with high-speed data transmission. Our TruLiFi range can also provide uninterrupted internet access in public transportation systems like aircraft and railways.

We innovate, design, build and deliver world-class lighting systems, embedded with intelligence and connected through software to deliver capability to manage, monitor, and control lighting assets, enable data harvesting and analysis for improvement of lighting operation and business performance.

What makes your products stand out from your competitors? What is your contribution to energy-efficiency and conservation?

Signify has been in the lighting industry for decades and has been a pioneer in many products and innovations. We have always tried to bring cutting edge technology and innovation in our products at the most affordable cost and have managed to build a trusted brand name. By focusing on energy efficiency, renewable energy consumption, and office space optimization, our five markets have reduced their overall carbon emissions by 19% in 2019. This brings Signify a big step closer towards achieving 100% carbon-neutral operations in 2020, one of the goals of its "Brighter Lives, Better World" sustainability program. This includes a reduction of 33% from non-industrial sites, 17% from industrial sites, 32% from business travel, and 18% from logistics. Signify offsets its remaining emissions through contributions to projects that have a positive environmental and social impact, including small-to-medium-sized wind farms in India and a hydro plant in Vietnam that operates without using a dam.

Signify introduced its "Brighter Lives, Better World" sustainability program in 2016, setting ambitious sustainability goals for 2020, consisting of two pillars:

Sustainable revenues: 80% of revenues will come from sustainable products, systems, and services by 2020; More than 2 billion LED lamps and luminaires delivered by 2020.

Sustainable operations: 100% carbon neutral for operations; 100% use of renewable electricity; Zero waste to landfill in manufacturing; Strive for a safe and healthy workplace with a total recordable case rate of less than 0.35; Ensuring a sustainable supply chain with a minimum supplier performance rate of 90%.

Signify has already started the phase-out of plastic by removing commonly used plastic inserts from Philips Hue bulb packaging. Signify already uses 80% recycled paper for its packaging and will now start phasing out all plastics from packaging for consumer-related products to be plastic-free in 2021.

It has also selected paper foam to pack the recently launched Philips Hue Play HDMI Sync Box. Replacing blister packs with paper-based box packaging. Will be sequenced across our product portfolio and different regions, starting with LED bulbs in Europe in the third quarter of 2020, and the rest of the world following from the start of 2021.

Tell us in detail about your UV-C lighting. Are there market sectors that Signify is yet to penetrate?

Signify has been at the forefront of UV technology for more than 35 years. We have a proven track record of innovation in UV-C lighting, which is designed, manufactured and installed in line with the highest safety standards. The COVID-19 pandemic has created fundamental shifts in consumer behaviour and needs. Advanced hygiene standards and minimal contact have become a priority for everyone at home and work. There has been a sudden increase in demand for UV-C products and services across businesses and for personal consumption. The Philips UV-C Disinfection system can quickly and effectively disinfect objects of daily use in homes, such as fruits and vegetables, packaged food, keys, mobile phones, stationery, laptops, and baby products. Although exposure to UV-C radiation can result in damage to the skin and eyes of both humans and animals, however, Philips UV-C Disinfection system has been designed to be completely safe for home use. The system is designed and manufactured in India and will be available here first before a phased launch in other markets of the world.

Keeping up with the demands we have actively invested in this area and have launched a B2C product (Philips UV-C Disinfection system) and expanded our B2B portfolio with 12 new families of UV-C-based products for professional markets.

How are you managing the production of lighting accessories and transportation in the ongoing pandemic?

The spread of the coronavirus has an unprecedented impact on the world and is still unfolding. The global economy will recover from this, but first, it will endure a significant short-term impact, which could ripple into 2021 depending on the country's success to manage the spread of the virus. About 98% of what we sell in India is made in India. We don't depend on China for finished goods. 60% of the components that we use are sourced from India and the rest 40% come from all over the world, including from China. These components are used by various industries such as electronics, smartphones and consumer goods and not just lighting manufacturers, and with further restrictions on tariff, most of these companies will get affected. Fortunately Signify India gets insulated from this because our teams have had started sourcing components from Taiwan, Hong Kong, Vietnam, Thailand and other emerging Asian economies to reduce dependency on China. However, getting this to scale will take some time. ■

Assuring Strength Across the Globe

We just don't draw wires,
We draw customer satisfaction.

Trust...

25 Years of Customer Satisfaction
Through Service Excellence

Strength...

13,260 Sq Mts.
Well Equipped Unit

Assurance...

ISO 9001:2015
Certified

Global Footprint

Covering Entire Globe
Including SAARC Nations,
African Countries &
Middle East

Manufacturer of Wire & Wire Products

- ACSR Core Wire & Strands
- Barbed Wire & Binding Wire
- Cable Armour Wire & Strip
- Earth Wire & Stay Wire
- Farming GI Wire
- General Engineering Purpose GI Wire
- Hard Drawn Steel Wire
- PC Wire
- RDSO Cable Tape
- Rope Wire - Black & Galvanized
- RQ/FQ Black & Galvanized
- Shutter Wire
- Spring Steel Wire
- Welded Wire Mesh
- Welding Electrodes

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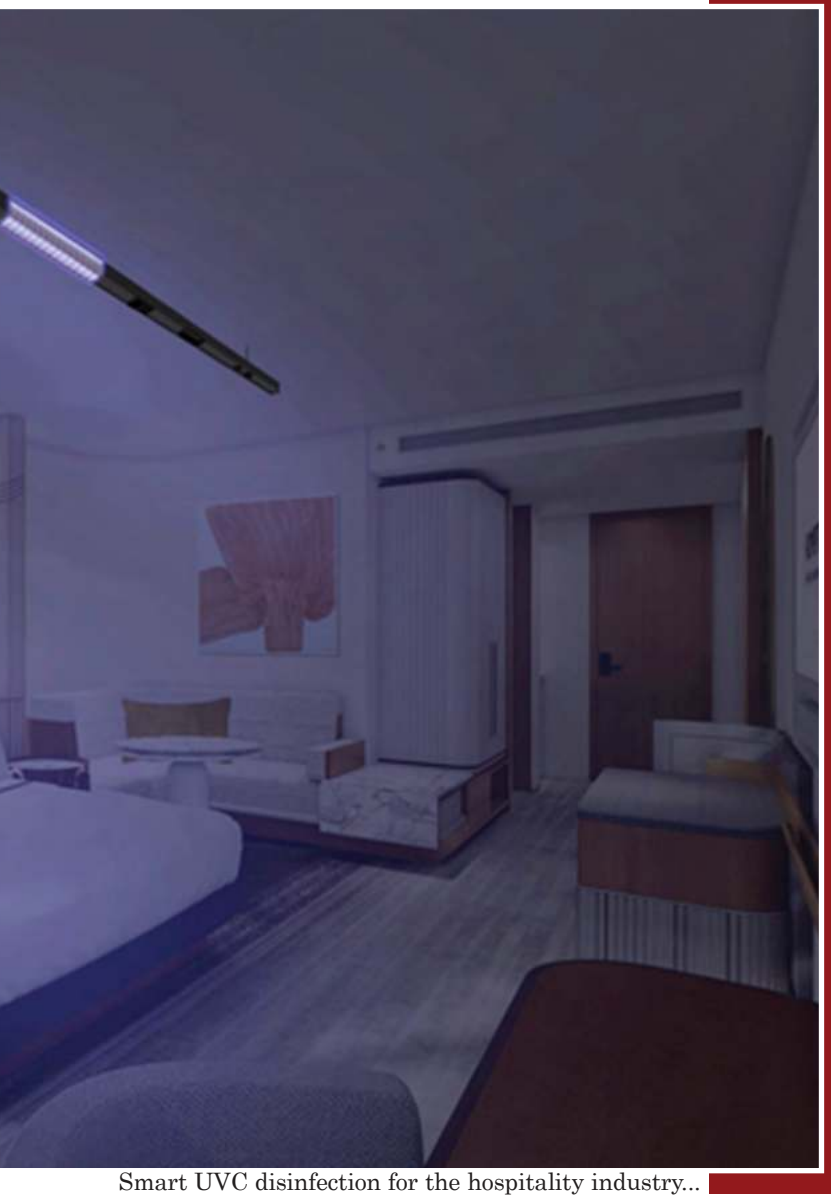
LIGHTING DESIGN OF THINGS

Lighting has to play a significant role in the coming era of New Normal, where the expectations from the industry will be much more and literally unbounded. Thus, the industry has to gear up...

Much has already been written about the digital change we are currently experiencing and the additional challenges caused by the worldwide Covid19 pandemic have only reinforced the need towards this digital change. We previously mentioned that lighting was reaching its Kodak moment and with most of the world now "forced" to work from home and restricted in movement, the digital virtual world has become a reality for everyone. Meetings are conducted in digital space, communication and monitoring is happening through wireless connectivity and the additional health precautions require social distancing and touch free operations. Lighting is poised to play a big role in this new world reality.



Smart UVC disinfection for the hospitality industry...

Daylight streaming...

Lighting, the designated host for our digital future

Lighting has in recent times become the number one contender to be the infra-structural host for all things smart in architectural spaces. The basic needs for smart systems are a power provision, connectivity and a known location. Lighting has all that. It is present in every space that is used by people, we know its location and is highly connected. The physical presence of lighting in every space therefore provides an ideal structure to integrate smart components. It is therefore no surprise that lighting is now becoming the designated host for our digital future.

The lighting challenge

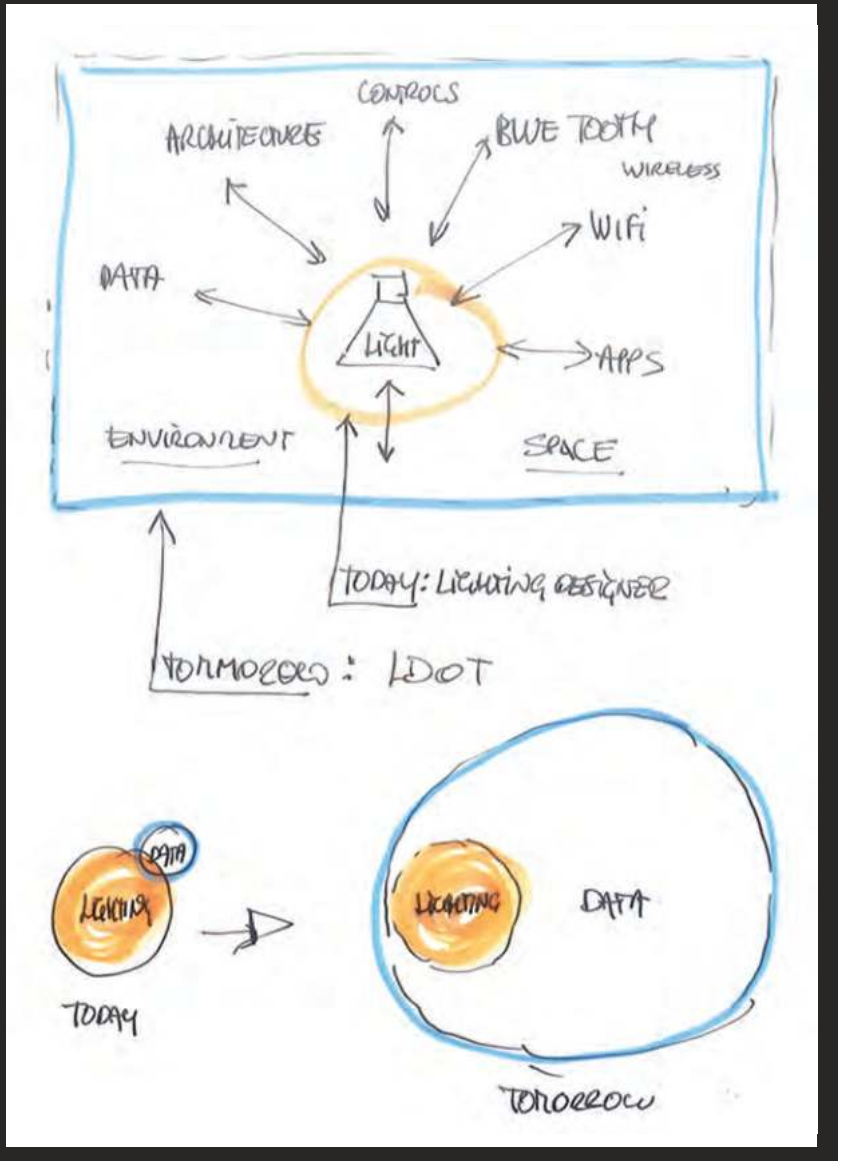
Many of the leading lighting manufacturers are launching themselves at full speed into the development new generation smart lighting fixtures. The smartness predominatly being its ability to integrate data connectivity and sensor devices into the lighting fixture design. The biggest challenge in doing so is of course to maintain the integrity of the the actual lighting performance. By integrating sensors, control and connectivity interfaces within the lighting fixture design, space has to be found that does not compromise the basic lighting function.

From lighting to data

What we see happening is that the data fuctions incorporated in a lighting fixture are going to overtake its primary lighting function in importance. While this may sound contradictory for a lighting fixture, one just have to use the mobile phone as a comparison. The (mobile) phone initially was designed and only used for its "phone" function, today no-one buys a mobile phone for its phone-ability but for its data functionality, its connectivity, its apps and functions. The same is prone to happen with the lightinhg fixture in the years to come. The need for data management will overtake the lighting functions and hence priorities in "lighting design" will shift accordingly.

New players in the market

Interestingly, we have found that there are now also many new players in the smart lighting market that originate from outside the lighting industry, mostly from the world of smart controls and network infra-structures. Many of those simply adding lighting control functions to their smart infra-structure and with that suddenly become a major player in the lighting industry.



Data evolution in lighting; the role of the lighting designer (of things) in the future...

Amazon (Web Services), Google and Apple are the well known "top of the iceberg" names when it comes to those entering the smart lighting market.

Lighting Design of Things (LDoT)

This is why a new breed of lightng designers is needed with one of its important tasks of being the guardian of good quality lighing design and making sure the lighting still complies with all applicable standards and codes of practices. The Lighting Designer of Things will have the critical but ever so important task to manage this integration process of merging the world of smart IoT devices with architectural lighting. LDoT is fast gaining acceptance in the lighting industry that for now is dominated by vendor driven solutions. With smart protocols becoming more open and interconnectivity between systems slowly becoming a necessity, the need for independent professional consultancy is growing.

Sensor technology

Key to data gathering are the various sensor elements and with the technology fast improving, allowing miniaturisation and multi-functionality, it is resulting in ever smaller and more performing sensors. Multifunctional all-in-one sensors that can capture (day) lighting levels, presence and motion (occupancy), temperature, humidity, air-quality, sound, indoor positioning, bluetooth and IR signals are now available for integration offering vaste opportunities for lighting integrated infra-structures that goes way beyond just lighting control!

Data collection

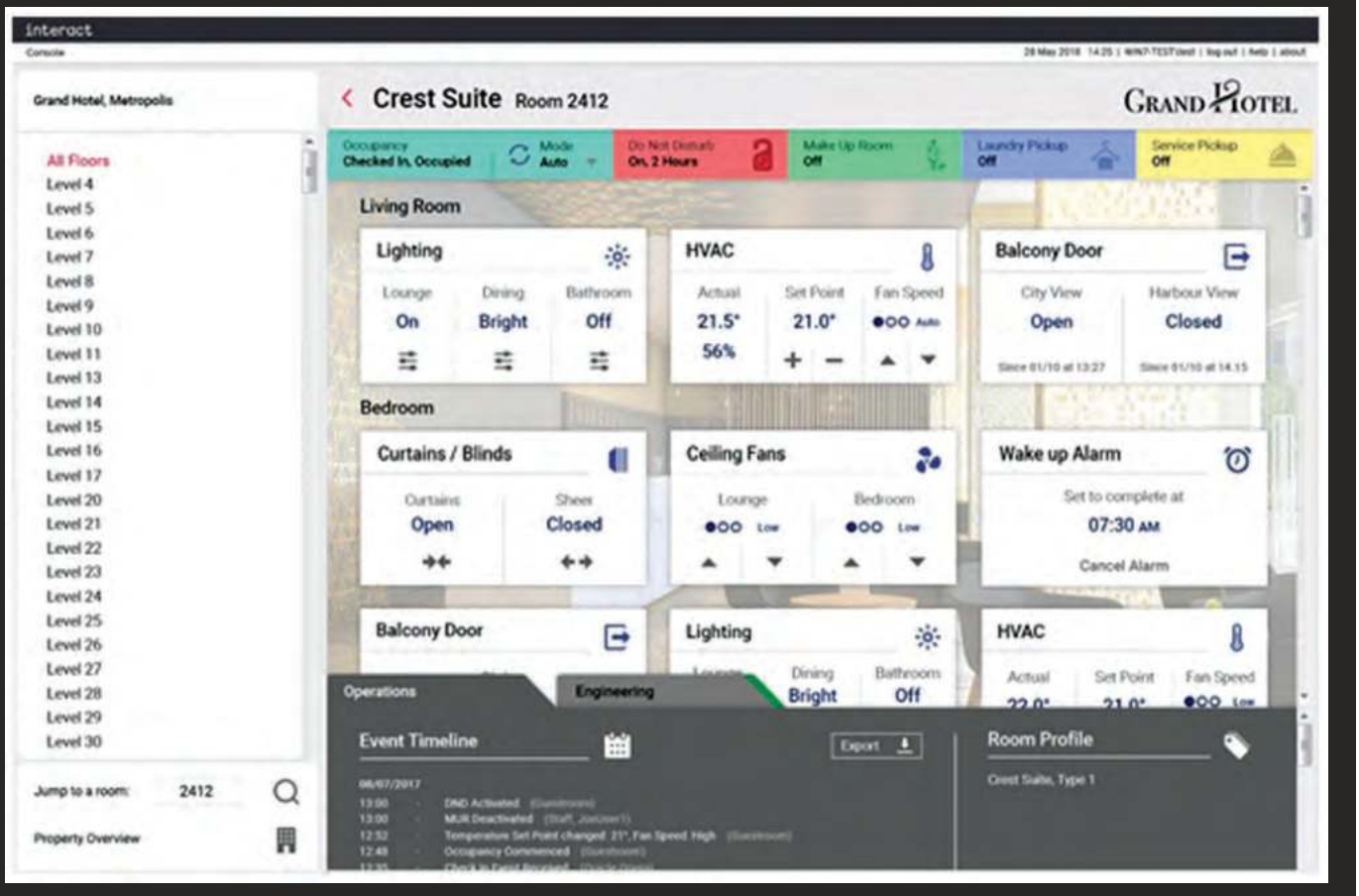
The key of course is what to do with all the data that is being collected. The information is both in real time as well as historic, which means that not only monitoring and alert functions are available but also user patterns and behaviours can be detected and analysed over time to improve space usage. Proper data analytics can then drive lighting controls, lighting scenes, air conditioining, air quality and actual space usage, resulting in more efficient use of all things energy and space as well as creating more human comfort.

Post Covid19 world

In the new post Covid19 pandemic world, we are seeing that these smart digital infra-structures are providing new opportunities as well. The need for "safe and healthy" environments as well as human wellbeing in general has created new demands that vary from the ability to clean spaces with UVC lighting, create more natural daylight in support of our personal wellbeing (circadian rhythms) as well as hands free controls and social distancing.

Smart UVC lighting

With the high and easy transmission rate of the Covid19 virus, cleaning of spaces and objects frequently used or touched is becoming a very high priority, not in the least to give people the peace of mind that ths concern is being addressed and taken care of by the owner or facilities management. Exposure to UVC lighting for predetermined time has been proven



Smart network systems; hotel operations dashboard...
(ref: Interact from Signify)

to be the most cost efficient and effective method for disinfecting spaces from any bacteria or virus, including Covid19. While mobile equipment in the form of robots or trolleys are being used as expensive short term solutions, integration of UVC in permanent smart lighting design is the cost effective solution for the longer term. As direct exposure to UVC is harmful to the human body, special absence sensors are required to safely operate the UVC lights. Current motion sensors are deemed unsafe as they require manual timer set ups to activate the lights only once everyone has left the space. These smart sensors can easily be integrated as part of any smart lighting infra-structure.

Smart daylight

Finally looking after our health and wellbeing has prompted owners, operators and facilities managers to look at ways to improve living and working conditions by providing better lighting by replicating or even streaming natural day light in spaces otherwise deprived of daylight. The new digital age allows for Spotify-like lighting applications, streaming daylight from any location in the world via video link through "light-speakers". This new patented approach is currently being devloped for commercial use and will be one of the many applications available as Light-as-a-Service! ■

Lighting Design of Things is now available:
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Ingmar Klaasen
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SMART LIGHTING AND INTERNET *of* THINGS (IoT)

(intelligenttechchannels.com)

Today, lighting is no longer just a means of illumination, rather it serves various other purposes including communication. With the changing trend, product standardisation is becoming more important...

Smart lighting is a technology driven concept that links three main features of solid state lighting (SSL) technologies, universal communication interfaces and advanced control. However, this conceptualization is continuously progressing to comply with the guidelines of the next generation of devices that work in the Internet of Things (IoT) environment.

Modern smart lighting systems are based on Light Emitting Diode (LED)

technology and involve advanced technology drivers. Now the lighting systems are evolving to support different wireless communications interfaces well suited with the IoT environment. Market propensity of SSL systems forecast the accelerated growth of connected IoT lighting control systems in different markets from smart homes to industrial lighting systems. These systems offer advanced features such as spectral control of the light source and also, the inclusion of several communication interfaces.

Image 1: Smart Lighting and IoT...
(Picture reference: www.hqdesigns.de)

(www.geospatialworld.net)

Smart lighting is a system of lights, which holds energy efficient LED drivers, advanced control algorithms, lighting sensors, and communication interfaces to collaborate and inter connect in a lighting network. At its core, a smart lighting system is being conceived as a flexible lighting system with the objective to improve visual comfort, as well energy efficiency.

Diverse implementations of smart lighting systems involve different communication interfaces and additional capabilities such as light spectral reproduction in real-time, advanced detection options with illuminance sensors and colour sensors. The latest lighting solutions include many features beyond conventional illumination purposes.

Smart Lighting

Smart lighting is the platform which encompasses different solid state technologies such as LEDs and OLEDs to illuminate both indoor and outdoor areas. Smart lighting systems generally include digital sensors, communications interfaces and actuators drivers. These lighting systems are programmed using advanced control algorithms and can be organized into lighting networks to operate remotely. Some of the most popular solutions are designed to change the light spectrum or colour. They can also control the level of illumination in a room when an external event occurs, for example, when a user has been detected by an occupancy sensor or when an event occurs such as the detection of vehicles or people on a road.

The smart lighting system abolish the need to work on the overall system in manual mode. The

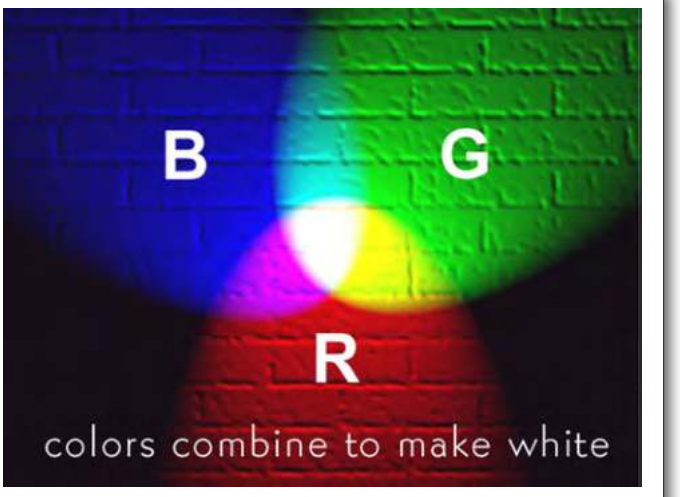

Image 2: Creating white light by mixing individual red, green and blue LEDs...

lighting network is programmed with an initial setup; however, each independent light can be reprogrammed to respond to the desires of people and situations throughout the day. In these systems, generally the areas are segmented depending on the people or events that may occur. This allows the systems to calculate the level of light needed, so that it can accurately calculate the levels of illuminance suitable for different tasks of the users with the advantage to calculate the power consumption in real-time.

Smart lighting systems placed and organised as lighting networks frequently permit different types of lights to interact with each other, so that they can be contemporised. It is also possible to control an individual light fixture through the cloud network by means of a remote controller or smart mobile phone.

Lighting Sources

White light based on LED: Humans are adapted to working in healthy environments that mimic the sun daylight spectrum. For this reason, we generally seek to illuminate the space with white light that imitate the solar spectrum. The most common method to obtain white light for illumination purposes, or optical communications, employs a combination of red, green and blue (RGB) LEDs as shown in Image 2.

Energy efficient LED drivers: Electronic drivers for lighting purposes are devices. Which regulate the power for LEDs and provide varying output current for matching light source characteristics. Most lighting systems prepared for the IoT environment include a power conversion stage with a constant-current LED driver, several LEDs organized in arrays and the inclusion of sensors and a communication interface as shown in Image 3.

Architectural elements: Smart lighting solutions include various devices, systems and network types. Devices are mainly luminaires containing sensors, actuators, and advanced algorithms. A combination of advanced algorithms allow for the observation of daylight levels, light spectrum, and user occupation to decide a final action. The algorithms run inside devices, or to alleviate the workload of the device the algorithm can run directly in the cloud stored as a web service to send command messages to execute the different control actions. Several algorithms for smart lighting are related to advanced operations such as to tune the colour reproduction in real-time. In the next page, Image 4 showcases the Architecture of smart lighting system.

Sensors for smart lighting platforms

Smart lighting system works with different sensor technologies and communication interfaces. The modern day IoT lighting principles aim to control lighting depending on varying the environment with a wide range of digital sensors. Image 5 showcases various sensor types to implement in such systems. RGB colour sensors are intended to

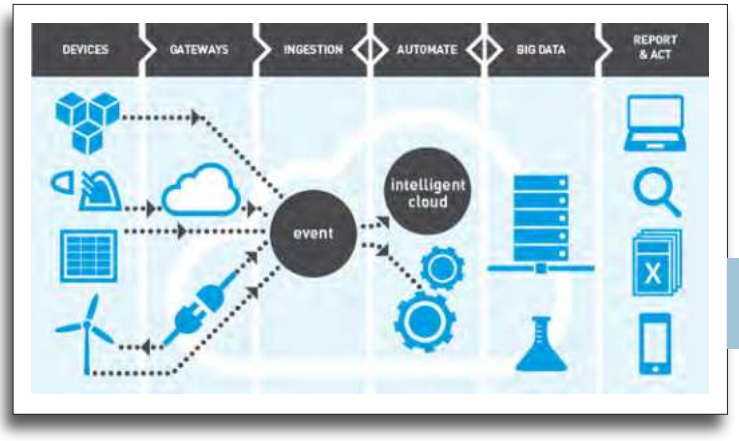

Image 3: Internet of Things (IoT) Value Chain... (Picture reference: www.pinterest.co.uk)

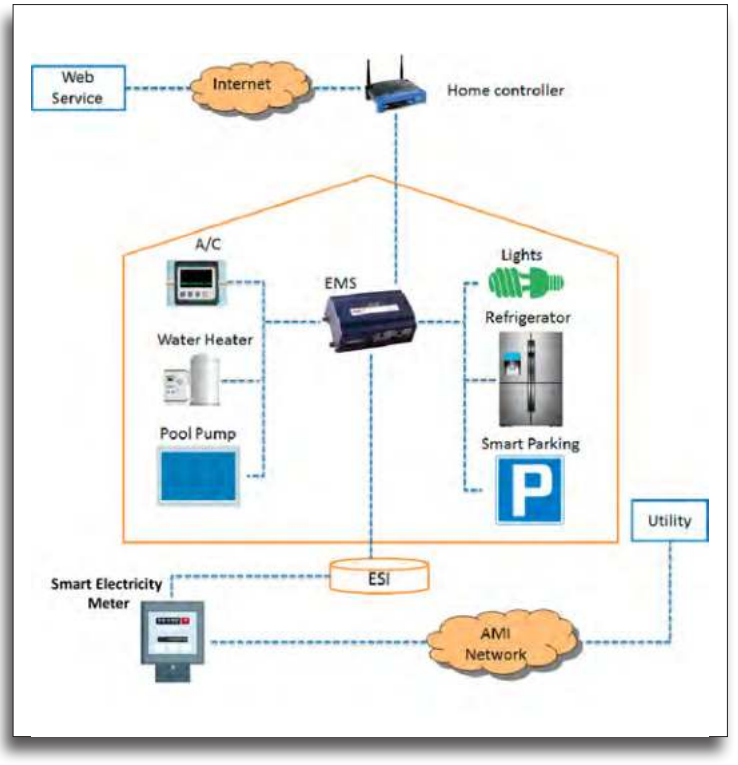

Image 4: Smart Lighting System Architecture... (Picture reference: www.r-stylelab.com)

detect red-green-blue content of light and tune white light in LED luminaires. For optical communications including Visible Light Communication (VLC) connectivity several technologies of photodiodes can be used in wireless links mainly in indoor environments.

In addition, more advanced functionalities such as spectral detection of light are covered with micro-spectrometers to detect the light spectrum in the visible range that can be detected by our eyes. In addition, it is well known that LEDs decrease their maximum luminous flux over time mainly due to temperature or aging effects, and therefore, such sensors and advanced control systems are of use to ensure best performance of the system.

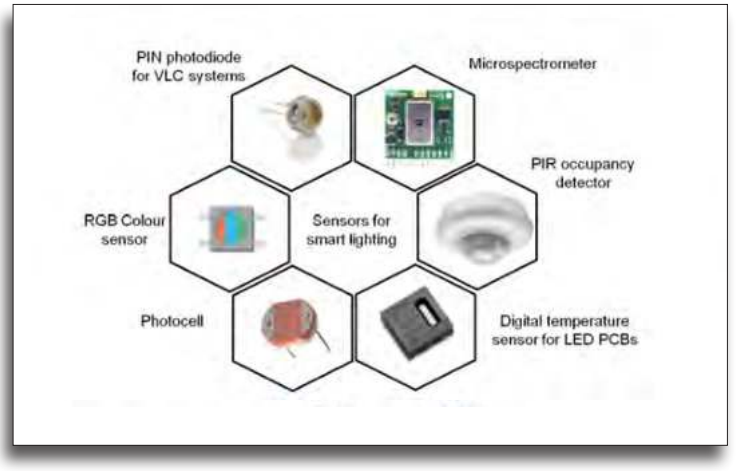

Image 5: Sensor technologies embedded in smart lighting...

Conclusion

Smart lighting is bringing a huge impact from the past few years, due to the accelerated deployment of LED drivers, sensors and connected LED platforms. Behind this tendency, different companies and vendors are in a race to connect smart LED luminaires on the same infrastructure of the IoT under Smart Cities Mission Programme of India. Lighting appliances and the IoT ecosystem converge in several areas: health and wellness, lighting systems with advanced sensing, optical communications, and location services. Moreover, such lighting systems require the use of wired and wireless connectivity to be connected to the Internet. However, as the world of standards and protocols is evolving, manufacturers and lighting solution experts need to adapt the products to lighting market tendencies especially when it is combined together with the IoT environment and advanced lighting control systems. ■

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WHY LEDs ARE CONSIDERED GREEN TECHNOLOGY?

The United Nations is encouraging countries for application of "Green Technology" in their activities in place of conventional technology. Also, countries are investing huge amount of their budgets for development of Green Technology in each and every sector of their economy. LEDs have enormous potential to reduce carbon footprint...

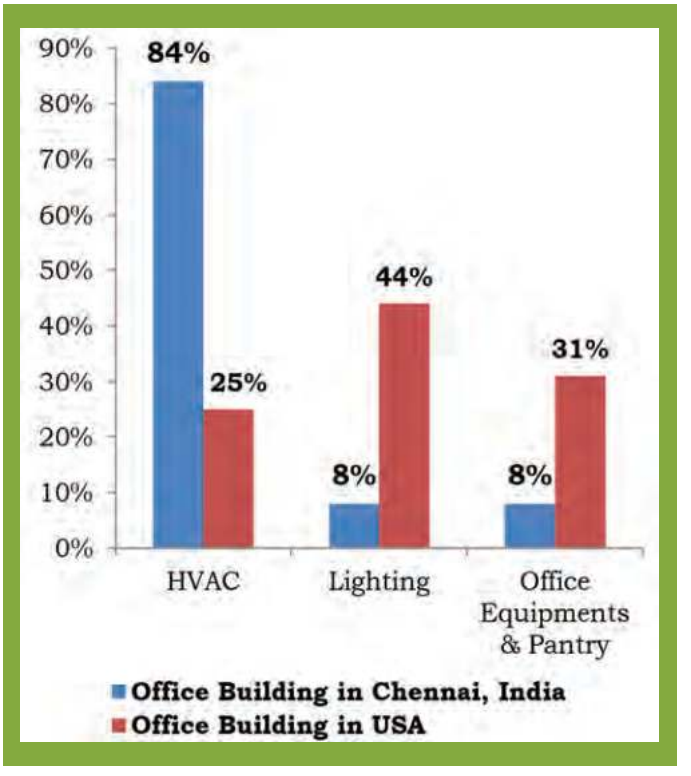
Climate change & global warming is one of the most dangerous threats to our planet Earth. Both are causing drastic degradation of our environment. Due to which, the temperature of planet Earth is raising and this is adversely impacting the natural cycle of different weather cycles on the planet. With the emission of huge amount of greenhouse gases (viz. carbon dioxide, carbon monoxide), the heat reflected from the earth doesn't go into the space due to the presence of greenhouse gases, this is causing rise in temperature of Planet Earth.

All the nations (developed and developing nations) are having deep concern over the climate change and its impact over the planet Earth. Climate Change is also causing adverse impact on life of human being as well as on economies of nations. Reports published by United Nations has shown that countries with transforming economies in Europe and Central Asia are facing serious consequences due to climate change such as warmer

temperatures and extreme weather events such as heat waves and floods. Thus, climate change & global warming are causing adverse impacts on people, species and the general health of our planet.

United Nations with the support of different nations has been taking necessary measures and steps for the improvement in the environment. United Nations outlined the policies and also implements these policies by encouraging the different nations to reduce the destruction of environment further. Reduction in Carbon footprints is being taken up as initiative for reduction in greenhouse gases. Nations are encouraged to use more and more green technologies for the betterment of our planet Earth.

United Nations is insisting on Sustainable Development which comprises of the following components



– Economic Development, Social Developments and Environment Protection. Such type of development focussed on the sustainable consumption of available natural resources with the progressive human development.

Distribution of Energy Consumption in Buildings

A study by Confederation of Indian Industry (CII) in 2009, suggested that for commercial buildings in India, electricity usage for air conditioning could be as high as of the total consumption.

Energy consumption in commercial buildings in USA and India has been shown in form of bar-chart above.

In USA, it is seen that the largest usage of electricity consumption is in lighting (44%); office equipment & others such as pantry makes up for 31% while HVAC (Heating, Ventilation & Air-conditioning) up 25%. Whereas, in an office building located in Chennai, India, the electricity consumption is shown during the season of summer, which shows 84% of the electricity consumption is for HVAC (Heating, Ventilation & Air-conditioning) and only 08% each for lighting and other office equipments.

From the bar-chart, it can be concluded that the two key-activities (Lighting System and HVAC (Heating, Ventilation & Air-conditioning) System) are responsible for consumption of maximum amount of electricity and need for special attention. There is need to address these two key-activities, which helps in reduction of energy consumption to a great extent. During design stage, it becomes important and most significant to focus on these two key activities.

Hence, these two key-activities viz-a-viz Lighting System and HVAC (Heating, Ventilation & Air- conditioning) System

need to be specially focussed with special attention for green building concepts.

Nowadays, many companies have established their offices and getting certificate (such as LEED Certification, etc.) from Third Parties for Green Building. With such concept, the buildings are designed to harness the maximum utilization of non- conventional types of energy sources and minimum wastage of resources such as water, food, energy. This also helps in the reduction of carbon footprints, which is the essence for control of climate change.

India is a country blessed with abundant sunlight throughout the year in most parts of the country. Thus, during design stage of building, sunlight harvesting ideas can help save on the energy use for lighting during day-time. Further, the provision of light fixtures having additional features such as photo-sensors, dimming functionalities shall be value added, so that when the outside light coming through the windows is insufficient (such as on an overcast day), electric lighting comes on automatically and the brightness adjusts to the required level of the internal illumination.

In addition to sunlight harvesting, electricity consumption on lighting can also be reduced with the application of energy efficient light fixtures such as LED lamps.

Thus, efficient lighting is the essential part of design for a building.

What is Green Technology?

Green technology, can be defined as an environment friendly technology which is developed and used in a way that conserves the environment and natural resources. Green Technology can also be termed as "Environment Technology" or "Clean Technology". Green Technology helps in reduction of adverse effects caused by human activities on environment. These also help in reduction of carbon footprints and pollutants released in our environment.

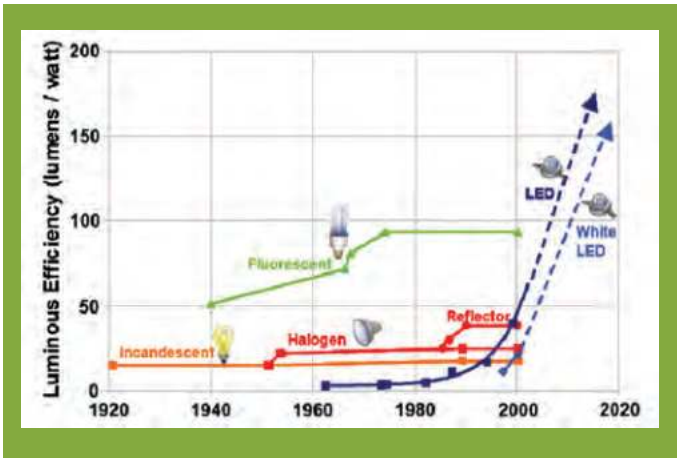
To address the problem of climate change and global warming, United Nations is encouraging countries for application of "Green Technology" in their activities in place of conventional technology. Also, countries are investing huge amount of their budgets for development of Green Technology in each and every sector of their economy.

Any products or systems can be termed as Green Technology, which meet the following criteria (Note: these criteria are not exhaustive but are only narrative here) –

- Energy (helps in conservation of energy with efficient utilization).
- Environment (conserves & minimizes the impact on the environment).
- Economy (enhance the economy of the nation with its utilization).
- Social (improve the quality of life).

LED as Green Technology

With the advent of new technologies in Lighting Sector, LEDs are proven as the most efficient over the conventional light fixtures. In this section, it will be learnt that LED fixtures are



now essence of time for energy conversation as well as help in reduction in electricity bills. Subsequently upon, LED can contribute a lot in terms of conservation of environment. With the numerous of benefits and advanced features, LEDs are considered as Green Technology, which is contributing for the conservation of planet earth.

LED (Light Emitting Diodes) is the latest and most accomplished technology in the field of Lighting (Illumination). During more and more concern for the energy conservation, LED has successfully achieved popularity because of its advantages and now successfully substituting the previously available conventional light sources such as incandescent lamps, CFLs, Metal Halide (MH) lamps, etc. LEDs are Light Sources which are based on semiconductor technology. Various types of LED are available in the market which can be used for different lighting Projects such as Street or Park Lighting, Metro Station Lighting, Architecture or Façade Lighting.

Presently, world renowned companies are investing huge portions of their expenditure in their R&D establishment, so that LED Technology may improve with more efficacy and benefits.

It is worth mention that LEDs fulfil necessary requirements for declaration as Green Technology. These features are discussed further:

Energy Efficient – (more lumen with less wattage).

- LEDs are more efficient than conventional lights such as
- fluorescent and incandescent lights. In LEDs, more than 95% of the energy is converted into light and less than 5% is wasted as heat. Whereas in conventional type of light sources, the situation become reverse.
- LED with higher efficacy (lumen per wattage) has resulted the less consumption of electrical power i.e., LEDs draw much less power in comparison with to the conventional lights. Thus use of LED means lowering the energy demand from power plants and that decreases greenhouse gas emissions.

Above figure shows the Historical and predicted efficacy of different light sources. From this the figure above, it can be seen that the efficacy in all light sources except LED

Light Sources	Lifetime Hours
Incandescent	750 – 2,000
Fluorescent	24,000 – 36,000
CFL	8,000 – 20,000
Halogen	2,000 – 4,000
LED	**35,000 – 50,000**

does not have almost any improvement in recent years (Source: Lumileds).

Thus, LEDs are energy efficient.

Environmentally Friendly – No Toxic Elements which damage to environment.

- LEDs are environment friendly. LED lights do not contain any toxic materials such as mercury or any other harmful metal, which may degrade the environment.
- LEDs are primarily consisting of electronic components such as PCBs, diodes, semiconductors, etc.

Thus, these components can be treated in the same way that traditional electronics treated. Thus, LEDs are recyclable. Which helps reduce carbon dioxide emission. Also, nations are encouraging their citizens for installation of LED in place of conventional light fixtures.

- Generally, LEDs are operated at less power for a given application in comparison to conventional light sources. Thus, the overall electricity consumption per year is less, this helps in reduction of the overall CO_2 emissions.

Hence, LEDs are environmentally friendly.

Economy

- **Low Operational & Maintenance Cost –** It's a fact that LEDs are costlier than other conventional light fixtures. But with the day-by- day new advancement in LED technology, the prices of LEDs are getting more and more comparable to prices of conventional type light fixtures. Further, due to the high efficacy (more lumen output per wattage) of LED fixtures, the operational cost of LED (i.e., electricity consumption bill) has been reduced to a great extent. Higher efficacy resulted to obtain high lux level with fewer quantities of LEDs. This helps in reduction of installation cost.

Thus, the usage of LEDs has resulted savings on huge expenditure been incurring on paying of electricity bills for lighting.

- **Long service life (Life Span) –** LEDs have a very long life span in comparison to the conventional type of light sources. The different components of LED are designed in such a way to extend LED's lifespan. LEDs don't have any types of metallic filaments (such as in incandescent bulbs, Metal halide, etc) or any type of gas (inert). Life of components of conventional fixtures weakens with the passage of time, which causes them to get fused. While LED don't burn out in the same way. LED has low heat levels, durability and high efficacy which make LED's more outlast.
- A brief summary of Average Rated Lifetime Hours shows the LED capability –

Thus, LEDs are economically much better option than the conventional type of light sources.

- **Social –** LEDs in comparison to conventional lighting, emits electromagnetic energy as light when electrical current pass through it and generate nominal amount of heat due to their high & efficient performance. Thus, working under LED lights, doesn't cause any increase in room temperature for long duration works.
- Also, LED does not emit any harmful UV Rays and hence doesn't cause any damage human skins who are working under LEDs for long duration.
- Heat generated by LEDs is dissipated by a special heat sink, which is designed to absorb any heat and disperse it safely away from the diodes, this helps to enhance the lifespan of LED fixtures. Hence, LEDs don't emit infrared radiation during illumination, which means that there is no warmth to it. Thus, this feature encourage for optimal usage in heat-sensitive and high temperature areas, such as displaying artwork because they won't cause fading or other heat damage to paints or dyes.
- "Color Rendering Index" (CRI), which measures how true-to-life an object will appear under a light source. Conventional light sources had very low CRI, which result the appearance of objects dull or vague. Whereas LEDs are available with High CRI which make colors look their most natural and vibrant.
- Also, the flexibility offered by LED is of beyond expectations. LEDs are provided with dimming options, which further reduce electricity consumption and helps in energy conversation. Further, direction of beam of light can be easily controlled in LEDs, which helps in focused lighting design as per the application.

Thus, LEDs help in the improvement of quality of life.

Conclusion:

Although, human activities have already destroyed the environment to a great extent that is resulting depletion of natural resources as well as causing adverse impact on human health. All these led to poor quality of life.

However, with the application of green technology such as utilization of LED technology, conservation of environment can be initiated and restored.

LEDs are Green Technology, which is helping human beings in improving the quality of their lives. ■

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LIGHTING MARKET
IN THE COMING DAYS

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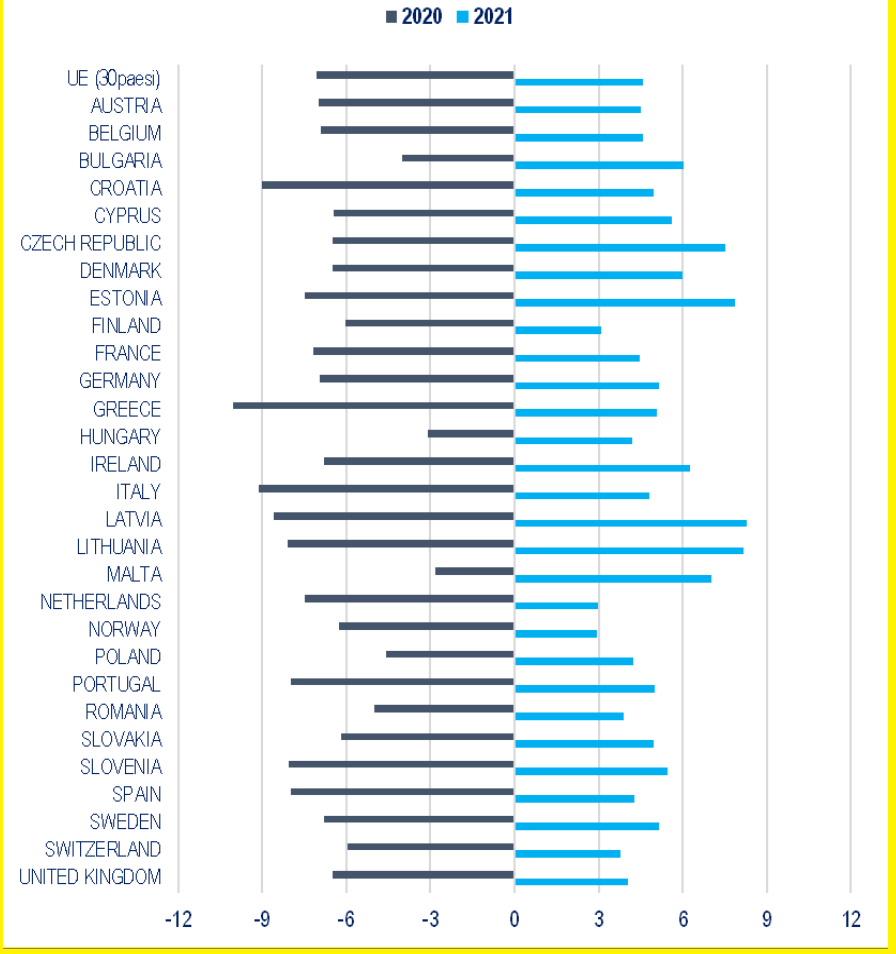
Although the impact of the lighting market will vary from region to region, apparently, technical lighting is expected to strongly drop in 2020, remain flat in 2021, and hopefully start recovering in 2022. The hospitality and retail segments will be among the harshest hit by the Covid-19 crisis. There is the possibility to use UV lighting for the sanitation of public areas.

At European level, CSIL forecasts a drop of 7.1% of the lighting market for the year 2020. This projection has been published in May and discussed in July in a zoom meeting with a number of VIP stakeholders of the lighting sector. This projection is perceived as optimistic from the majority of our testimonials at the Zoom meeting. Indeed, many companies operating in the industry expect to register a double-digit decline for 2020. It is also important to distinguish between areas. The geographical differences regard both the impact and the responses. For example, the Nordic markets have been suffering much less than countries like the UK, Italy and France and there is still potential for several projects. On the other hand, not only the UK has been hit

stronger than others but its government has been delivering confusing messages in term of its economic response. Much will depend from the second half of the year. A possible solution will be to offer two scenarios: a bad one, including a possibility of other lockdowns in the coming months; and a good one, assuming there will not be any further lockdowns. Also the recovery projected for 2022 and 2023 may be overestimated. Only by 2023, the market will return to the same level of 2019, even with differences from market to market.

In term of public funding and financing the largest stimulus will be addressed hospitals and public administration building. Other initiatives regard home renovations and energy-saving interventions. A further push to the industry will be provided by the face out of conventional lighting. Regarding education facilities, street lighting, and infrastructures, the magnitude of the public helps will depend on whether the funds for the recovery will be intended to the development of economic activities or towards investment in infrastructures.

Technical lighting is projected to strongly drop in 2020, remain flat in 2021, and hopefully start recovering in 2022. The hospitality and retail segments will be among the harshest hit by the Covid-19 crisis. Especially, the retail segment will suffer a lot also because of the competition coming from Asia in term of prices, while for the hospitality segment the crisis could arise also new opportunities. Office lighting won't register positive performance in the coming years as smart working is flourishing and it also will suffer from pressure, in term of prices, coming from the Asian competitors. Some opportunities for the business could come from new layouts for traditional offices. However, part of the office lighting sales will be absorbed by the consumer market in the form of home office, which is projected to remain flat at worst but not to decline. In particular, the high-end residential segment is expected to benefit the most from government support.



For the contract business, the uncertainty arising from the crisis is the biggest threat because it forbids to plan projects. Activities are expected to restart in 2021. On the other hand, e-commerce is expected to increase its share in the coming years. Still, the performance of e-commerce varies across segments. In fact, e-commerce has emerged to perform much better for the mass market rather than for the technical one. In addition, it is going to becoming a more and more struggling topic in the future because of the bad quality of many products that are available online.

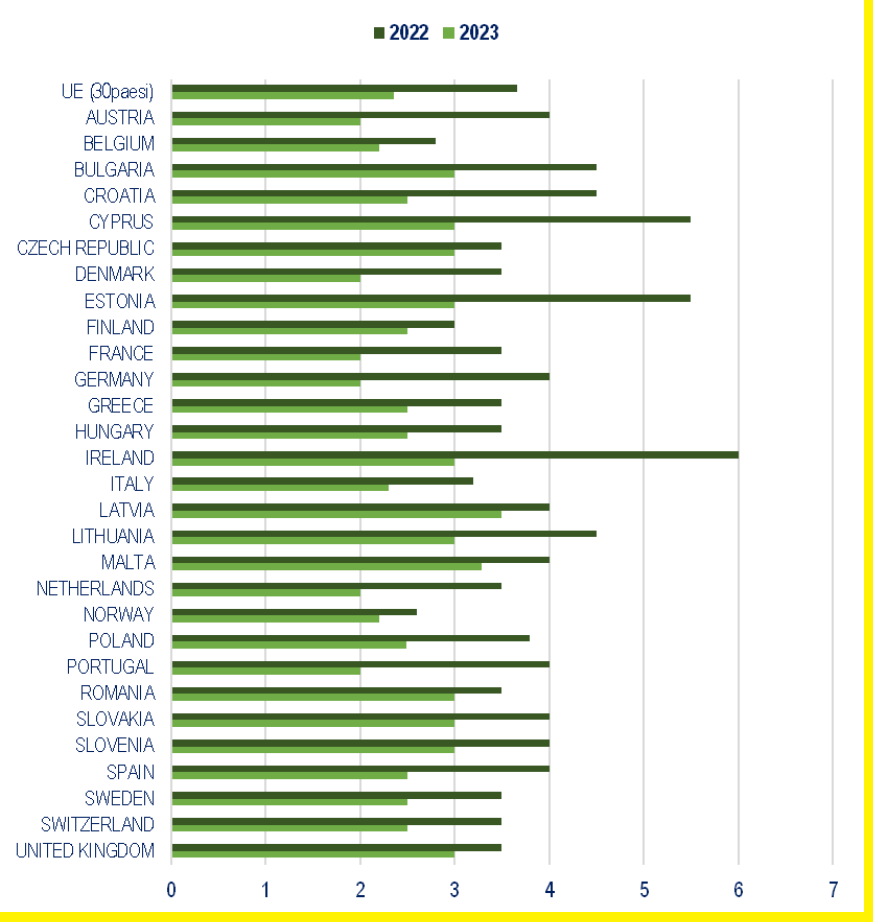
In terms of the competitive system, the process of consolidation is expected to continue especially towards the concept of omnichannel.

A final rumour regards UV lamps. There is the possibility to employ UV lighting for the sanitation of public areas. But it is still a question mark.

In the United States, the lighting market registers an -18% performance for the quarter ending 31st May 2020 (we use the Acuity data as a reasonable good proxy for the National level) and a decrease by -11% for the last nine months. The 2020 results could be worse in the United States than in Europe, but it is also true that the market could be more resilient in the mid run (2021-2023).

The first answer to the crisis for the US lighting industry is in the direction of consolidation: Hubbell is simplifying its organization (from three to two business units), Ecosense is acquiring the prestigious LED lamps activities of Soraa ……but the consolidation trend has started already in 2019: Signify with Eaton, Delta with Amerlux, Acuity Brands that acquires The

	2019	2020	2021	2022	2023	Source
	% yearly variation (constant prices)					
GDP	1.5	-7.1	4.6	3.7	2.4	IMF/Prometeia/CSIL
Inflation	1.4	0.6	1.2	n.a.	n.a.	IMF
Building activity	2.7	-11.5	6	3.5	n.a.	Euroconstruct
Lighting market	0.9	-7.1	4.6	3.7	2.4	CSIL
of which import from Asia	5	↓	↓	↑	↑	CSIL
Employment	-3	↓	↓	■	↑	CSIL
30 European major cities	3.7	3.7	3.7	3.7	3.7	CSIL*
Kitchen furniture market	2.2	-8.5	4.2	3.5	2.5	CSIL
	% share					
Top 4 players (%)	20	?	?	?	?	CSIL
Top 20 players (%)	40	?	?	?	?	CSIL
Top 50 players (%)	52	?	?	?	?	CSIL
EBITDA (%)	11	↓↓	↓	↑	↑	CSIL**
Contract / high-end	20	■	■	■	■	CSIL
Mass market	75	↓	↓	↓	↓	CSIL
E-commerce	5	↑	↑	↑	↑	CSIL
Hospitality. Retail	15	↓	↓	↑	↑	CSIL
Consumer	37	■	■	↓	↓	CSIL
Office. Schools. Healthcare. Street	22	↑	↑	↑	↑	CSIL



Luminaires Group, ALW acquired v2 Lighting Group (a move that further strengthens ALW's position as an industry-leading manufacturer of specification-grade architectural and decorative LED luminaires),H.E. Williams, Inc. Acquires Platformatics, Inc., Viscor was acquired by Leviton (sixth lighting company).

Also to be mentioned how the outdoor lighting business is changing: LED Roadway Lighting (Canada) for example is investing in its Liveable Cities division, that provides a full solution for smart cities, including LED streetlights, network technology, smart sensors and software, in cooperation with Sierra Wireless.

Main applications are traffic analytics, environmental and noise sensors.

Another innovation field is the so called human-centric lighting. About it, RAB (one of the leaders in the US mass market for lighting products) has recently launched SmartShift: with one click, enabled lighting fixtures on a Lightcloud system will set themselves to your time zone and begin adjusting your light level and colour temperature to match the natural pattern of the sun... a soft glow in the morning, energizing light during the day, and a warm hue in the evening.

The EZPAN family of edge-lit panels is the first of many RAB products that will be offered with integrated SmartShift technology. They are a low-profile panel solution for adding circadian lighting to offices, education, hospitality and healthcare facilities.

In India, sales decrease during the worst months peaked to -50% in some cases, also due to the interrupted supply chain with China for some components. But the entire year will probably register a lower decrease than in Europe or in the United States. There are even margins for growth in the healthcare, hazardous environment, emergency lighting segments. The street lighting market, thanks also to public contribution, performed well in recent years and probably will still go on. But perspectives for the professional market in the short run are not optimistic. Connected lighting will probably see growth also with new actors, as Panasonic Life Solutions, together with Signify (Philips), Crompton and Bajaj. ■

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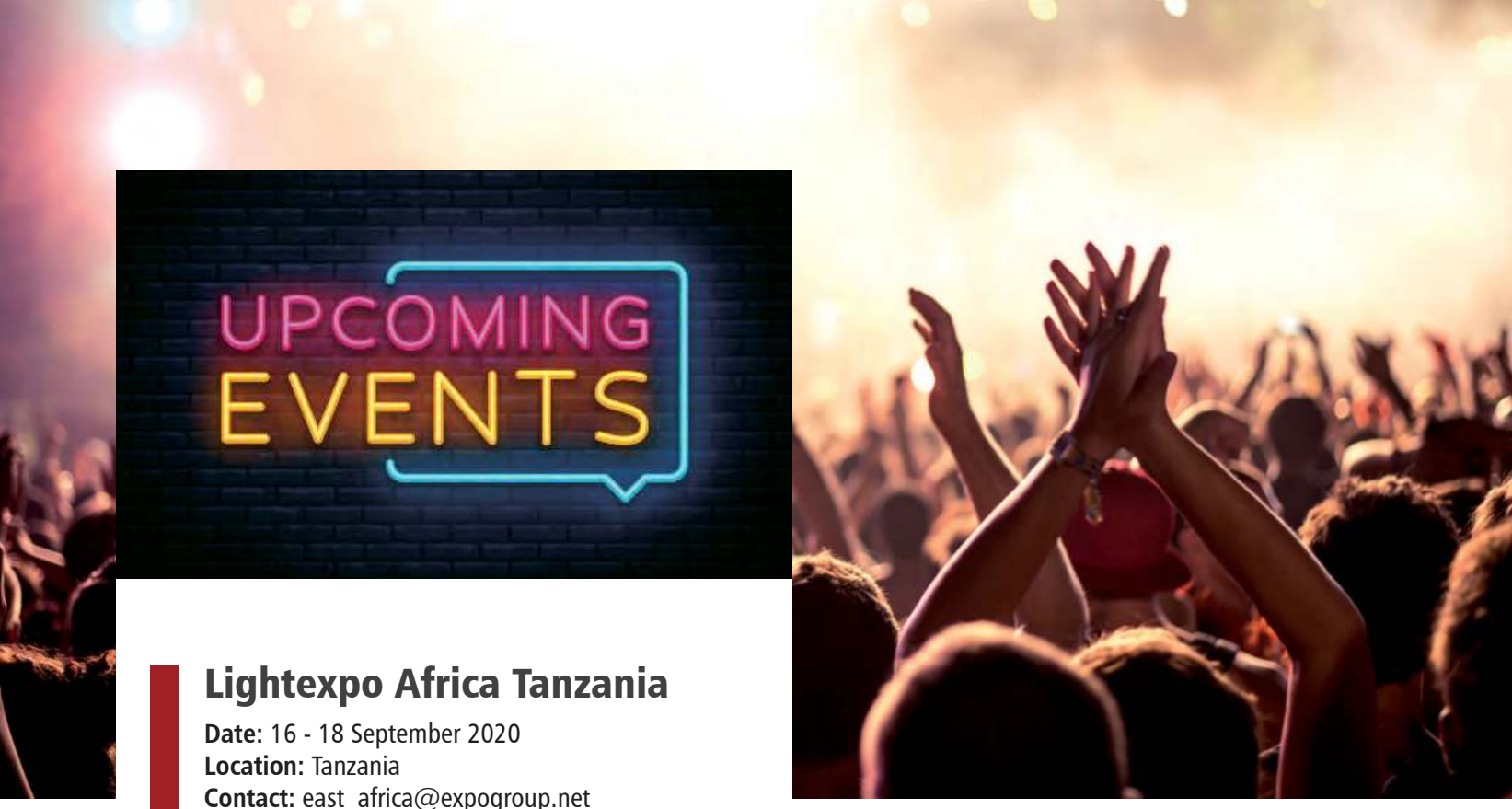

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+255 713 246 267

Media Expo-Delhi

Date: 18 - 20 September 2020
Location: India
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+91 9811653863

Light + Building

Date: 27 September - 02 October 2020
Location: Germany
Contact: maria.hasselman@messefrankfurt.com
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Contact: ace@exporum.com

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Date: 24th September 2020
Webinar Name: Biophilic Design

Company Name: IES Illuminating Engineering Society
Time: 12:00 PM-1:00 PM
Date: 1st October 2020
Webinar Name: Roadway Lighting - Lighting and Health

Organizer : Signify
Time: 4:00 PM CET/10:00 AM EDT
Date: 22nd October 2020
Webinar Name: Bringing the benefits of natural light indoors

NEW: Infineon's ICL5102 LED driver IC

High performance PFC and resonant controller for LCC / LLC

In today's fast growing lighting market universal solutions with high efficiency levels, smaller form factors, reduced cost and benchmark reliability is what customers ask for. Infineon responds with its new highly integrated combo controller IC with universal input of 90 - 305 V allowing for global designs.

The ICL5102 integrates a half-bridge controller with a PFC stage in a single DSO-16 package and impresses with a THD factor of <3.5% and a high power factor of >0.95. The resonant topology driver achieves a high efficiency up to 94% which results in more lumen output and less thermal load. Furthermore, it features an advanced burst mode for lowest standby power. Thanks to the high integration, there is less need for additional expensive components in PFC and LLC stage, bringing the overall BOM cost down. Several integrated protection features and auto restart complement the offering.

Summing up, Infineon's new ICL5102 LED driver IC enables high-performance, cost-effective designs, while keeping spending on LEDs and heat sink low at the same time.
Target applications: LED driver for professional commercial lighting, and smart lighting, street lighting for smart cities, horticulture lighting, offline AC-DC power supply, LCD TV, adapter and battery charger.

Key features

- Universal input 90 - 305 V
- Highest efficiency up to 94% by resonant topology
- THD <3.5%, PF >0.95
- Burst mode, low standby
- Low BOM cost
  - Combo controller IC
  - 500 V MOSFETs at LLC stage
  - Low cost resistors to set working points

Key benefits

- Enabling global designs
- Use from 40 – 300 W
- Best-in-dass PFC and THD at full and light load
- High efficiency: more lumen output and less thermal load
- No components required to match the PFC and LLC stage
- Integrated protection and auto restart

www.infineon.com/icl5102