

# ARCHITECT and INTERIORS INDIA

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**iGen 50**  
**ICONS OF  
TOMORROW**

THIS BATCH OF INSPIRED YOUNG ARCHITECTS  
AND DESIGNERS OF 2018 HAVE WHAT IT TAKES  
TO CHANGE OUR LIFESTYLES AND CITY SKYLINES



# SEEING LIGHT

NEXT-GENERATION LED LIGHTING SYSTEMS ARE A GAME-CHANGER THANKS TO THEIR FLEXIBLE DESIGN AND AMAZING EFFICIENCY

BY ARUNA RATHOD



**E**nergy-efficient LED lighting is changing the way people think about lighting. Modern lighting technologies play an active role in accenting spaces or creating a pleasing atmosphere for people to thrive in.

The LED industry in India is bullish on its growth prospects owing to the increasing awareness about LED products amongst consumers – be it for homes, offices or public spaces. The major shift in the LED space has been the transformation from a product-based solution to a comprehensive connected lighting solution, paving the way for a fully digital world. In addition to these functionalities, LEDs also have a lower cost of ownership, higher durability, longer life and deliver an enhanced lighting experience as compared to conventional solutions.

Sumit Joshi, vice chairman and managing director, Philips Lighting India, states, “LEDs are fast becoming the one-stop solution for all lighting requirements, since they are not only restricted to home decor – but also cater to professional segments like street lighting, retail and industrial lighting.”

There was a huge improvement last year in LED manufacturing and sales. Cost-wise, there was a dip in the retail price, backed by lower costs of components and increased volumes – leading to economy of numbers. Technologically, too, there have been significant innovations at the chip level, which have made the products more efficient. “The difference is in thermals and lumens, wherein better quality gives you even lower heat dissipation and increased light output at lower wattages. Some of the other advancements include products like Filament LED lamps that have been designed for décor enhancements and better aesthetics,” states Tushar Gupta, executive director, NTL Lemnis.

#### SMARTER AND BETTER

Latest innovations in LEDs like Smart Lighting are making lights more intuitive and interactive. Anirudh Kajaria, business head, Century LED, adds, “The LED lighting market has undergone a robust change in the past few years. Novelities in lighting solutions are emerging every day to give wings to our concepts of contemporary decorating needs.”

By 2030, the primary energy supply, at a conservative estimate, will need to grow about four times and electricity supply by five to seven times of today’s consumption. In the

professional sector, the efficient LED is already invincible for its exemplary light output. Jayanth Jain, MD & CEO, GM Modular, states, “With newer introductions, there has been a revolution in the LED technology with regular down lights, panel lights, surface lights, chandelier lights, LED street lights and other residential and industrial applications.”

Also, the lower costs become an inevitable advantage over the rest of the light sources, and that further curbs the impact on climate damage and lowers switching costs to LED technology. Gradually, it will supersede all other light sources such as fluorescent and discharge lamps in every sphere.

Product designer Vibhor Sogani of Studio Vibhor Sogani feels that, while LEDs have been seeing a lot of changes over the past few years, the interesting thing for him is that the sizes of the modules have reduced. “They have become smarter and better. The outdoor versions have become user-friendly, but the thing that has stood out most for me is the warm-dim LED’s which behave like halogens when you dim them. This really excites me, since nothing else really matches the colour rendition of a halogen.”

Worldwide, LED lights are being used increasingly in the automotive industry, particularly in advanced forward lighting where adaptive beam headlights minimise glare while optimising illumination for drivers. These arrays of LEDs are controlled by forward-sensing technology and boost driver safety. A microcontroller dims LEDs for oncoming drivers (or vehicles that are following), while typically keeping the high beam on for other zones on the road. VP Mahendru, chairman & managing director, EON Electric Ltd, says, “EON LED battens have been gradually gaining ground globally in the past year or two. While approved in Europe but in limited use, the industry norms are under finalisation in the USA. Such systems possess tremendous potential to ensure safety of traffic on highways.”

#### CREATING AN EFFICIENT AMBIENCE

Different wavelengths of LED light can cause different reactions that have medical and sociological benefits. Blue light, for example, can make one feel alert; and energetic yellow wavelengths can help one relax and fall asleep. Red wavelengths have therapeutic value for the skin. The benefits are many, and the malleable nature of LED lighting means that we can match the lighting to our requirements.

Gupta observes, “Today, all studies prove that LED light balances circadian rhythms. In other words, since it mimics natural light, it promotes a sense of well-being and induces

1. Vibhor Sogani's Cascade light installation takes inspiration from Frank Lloyd Wright's modernistic masterpiece.

2. For Orion, a crystal-based installation, Sogani drew inspiration from interstellar forms seen in the night sky.

3. Sogani's Beehive light installation combines stainless steel forms, bakhtar craft and gold-plated bees.





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effective working conditions and no depletion of energy. Again, since there is constant light, there is a lower incidence of health issues at the workplace – leading to better productivity. Some other proven benefits include improved concentration, energy, health and well-being.”

When companies look at revamping office spaces, optimising work force productivity is stressed on – where lighting plays a key role. Kajaria says, “The lighting in a workplace has a considerable contribution to the office atmosphere. Adequate lighting can increase productivity up to a favourable percentage with a better isolation of problems, making employees more alert and managing their stress levels. Efficient lighting allows employees to concentrate better and can decrease errors by 30-60%.”

Most LED lights are BIS (Bureau of Indian Standards) approved, which certifies the product quality and safety. Some of the proven benefits of LEDs are that they are ecologically friendly, decrease occurrence of headache, increase learning performance, increase productivity, and decrease the levels of anxiety and stress.

#### DEVELOPMENT STRATEGIES

While LEDs are offered in a variety of base colours such as red, green, blue and amber, they can also be blended together to produce millions of colour options without



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including specific filters for each. With more developments in this technology, LEDs will continue to be ideal solutions for interactive signage, signalling, advertising hoardings and decorative illumination of buildings.

To attract the market, GM Modular has been coming up with a great line of products. Jain explains, “GM introduced high-quality LED lighting solutions with down lights, surface and panel lights, LED streetlights, flood lights and more for a wide variety of residential and industrial applications. The whole idea was to reduce costs and make LEDs affordable for domestic consumers.” GM developed an LED that lasts about 30 times longer than the regular incandescent lamp. It has higher luminosity with which a 3.5W LED can replace a 40W incandescent lamp. This development helps lessen maintenance and save more than 85% of energy.

More value addition is definitely possible in the mechanical category. The movement from glass dome to plastics has already helped lower costs. Photometry element of LEDs and LED PCBs (printed circuit boards) has greatly improved the output emitted by the luminaires, allowing brighter light per watt. As for the electronics components, the more advanced they get, the better quality light output is achievable. “Developing the nano technology will help in reducing the electronic circuit design and making it more compact. This, in turn, will lead to more flexibility in designing the luminaires – and we are working in this direction,” says Gupta.

A typical 84W fluorescent lamp or a 36W fluorescent tube can be effectively replaced by 36W LED bulb and 18W LED batten. “In addition to this, 27W and 40W LED bulbs are now available in the same price ranges as CFL bulbs, and with better lumen output. Similarly, a 14W LED bulb can replace a 100W incandescent bulb efficiently,” says Mahendru.

#### EMOTIONAL CONNECT WITH LIGHTING

Architect Luis Barragán gave us the term “emotional architecture” to express art and architecture’s emotional appeal – an aspect made more visible by lighting. High-quality lighting can express certain emotions. Jain believes, “The upcoming trend in the lighting segment has already become invincible for its exemplary light output and low energy consumption. With the freedom to adjust the lighting, the intensity, the colour, the direction, LED lighting has taken a big leap. This gives scope for building connections between lighting design and the user’s comfort level.”

**People are becoming more conscious of the fact that lighting is actually the fourth dimension of architecture.**

4. Century LED Vulcan Highbay has a powerful illumination.

5. Atlantis Flood light by Century LED has a low glare output and lasts longer.

6. The 7-watt Glitter lamp by Century LED can replace a 50W halogen lamp.



Sogani states that, earlier, lighting just lit up spaces. “With the advent and introduction of an array of lights, professionals are also addressing this particular aspect. There are, of course, different layers of lighting in any project – functional, ambient and emotional. When you address the emotion, you also automatically address the function.”

For any kind of visual communication, lighting plays an important part. The emotional connect really comes from a sensory connect and, amongst the senses, vision plays a predominant role. What we see and how we see it becomes dependent on the light associated with the object/artist/brand/monument in question. Gupta believes, “There has to be ideal contrast ratio between the main product and the surroundings to create an impact on the viewers. Amalgamation of different CCTs (Correlated Colour Temperature), CRIs (Colour Rendering Index) and beam patterns to light up the façade or a monument/architecture can create different emotional connections. Lighting is one the most important ingredients of the visual media.”

Quality lighting has the capacity to mould common perceptions of style, spaciousness and serenity of a particular place. The right lighting fixtures can enhance the desired ambience of a space, adding to its utility and beauty. However, lack of efficient lighting can trigger depression. Recent studies show that spending excessive time solely in harsh artificial light can cause nervousness and uneasiness.


Regardless of our professions, light affects our lives in many ways. Kajaria states, “Lighting connoisseurs and designers are employed to generate a perfect ambience in every architecture application. A creative space can be optimised using LED dimmers. Studies suggest that emotions are elicited more intensely under bright lights and, contrarily, dimming the lights reduce emotionality in everyday decisions.”

Though there are varied factors that can affect our health due to unbalanced lighting, there are ways to connect ourselves better with suitable lighting. Hence, efficient lighting



adds to the value of selective retention – as it connects us emotionally with the other elements of design.

With new applications and features, different sensors are becoming the norm with LED lighting, such as motion sensors, IR sensors, photo-sensors, etc. Dimmers and lighting controls that lead to flexibility of usage and customisation according to requirement, are also gaining prominence. Mostly used for mood lighting, Smart Lighting is a better way to save energy and continues to garner much interest. Connected lighting (network connectivity and intelligent lighting) integrated with LED luminaires is likely to become the reality in India with the advent of Smart cities.

Innovative LED lighting solutions are driving the market forward with their amazing lifetimes, low energy consumption and quality of light, providing businesses with the opportunity to retrofit or upgrade existing fixtures to LED and improve their bottom line, experience high ROI (return on investment) and lessen the impact that their business has on the environment. 

7. The widespread use of LED solutions like those by EON are fast replacing conventional light sources.

8. NTL Lemnis spot light, used as wall washer, gives a positive vibe to a space.

9. Atrium area lit with NTL Lemnis down light and flexible strip.



# INDUSTRY SPEAK

## LIGHTING EXPERTS TALK ABOUT WHAT MAKES AN LED ENVIRONMENT-FRIENDLY AND ITS IMPACT IN RURAL AREAS

**Are there enough environment-friendly technologies/options in LED segment?**

**Tushar Gupta:** LED lighting by itself is the most environmentally-friendly technology available across the globe. It has no mercury, and emits no ultra-violet rays and no Infrared rays (IR LEDs are also now available for medical benefits). In addition, it is hugely energy saving. So, for the foreseeable future, it will be LEDs and their various formats that will rule as the primary source of electric lights.

**Anirudh Kajaria:** LED light bulbs have seen plenty of growth in recent years with the varied advantages these bulbs possess in comparison to other modes of conventional lighting. With every new generation of technology, there is a huge gain in terms of efficiency and lifespan. Costs have come down considerably, and the technology has delivered more options to consumers. Advanced environment-friendly technologies, used in the LED industry, have helped us in eliminating our carbon footprint drastically, with emissions coming down by over half a billion tons in 2017, as a study suggests. In addition to this, LED lighting is one of the most efficient lighting solutions available in the market. According to the Department of Energy, widespread use of LED technology could result in saving up energy, equal to the output of 44 large electric power plants.

There is a second factor to induce environmentally-sound technologies: the formation of waste. LED lights have a much longer lifespan than conventional modes of lighting. Bulbs with longer lifespans do not have to be replaced at a regular pace. This technology reduces the amount of waste created by each household and business. To sum up, LED lighting solutions allow us to bind the amount of energy we consume when lighting up our home or office. They are a sturdier and more efficient option than incandescent and fluorescent bulbs in practically every measurable way.

**Vibhor Sogani:** LEDs are environment-friendly because they consume much less power than fluorescent lights and run

### PANEL OF EXPERTS

**Tushar Gupta**, executive director, NTL Lemnis

**Anirudh Kajaria**, business head, Century LED

**VP Mahendru**, chairman & managing director, EON Electric

**Jayanth Jain**, MD & CEO, GM Modular

**Vibhor Sogani**, product designer, Vibhor Sogani Studio

cooler – for instance, you could pretty much light up an entire house in 100W. Having said that, one has to be smart about it since, typically, with LEDs, if the application is incorrect, there would be a lot of light loss.

**What is the future of LEDs in rural areas?**

**Gupta:** I am of the opinion that we have not even started work in the rural areas. While EESLs (Energy Efficiency Services Limited) work is commendable in the rural sector, wherein LED is reaching even remote villages, a major factor that is important to consider is the availability of electric supply in these areas. In this context, we believe that solar LED lamps can play a major role. Solar LED lighting in all its applications – lanterns, torch and street lights – have immense potential. There is already some activity happening in the field, but it also requires the government's impetus to go [mass-produced]. Once the pricing becomes more affordable, we feel that the rural consumer will be more amenable to it.

**Kajaria:** Under Government of India's UJALA (Unnat Jyoti by Affordable LEDs for All) scheme, the country intends to save around 20,000 mW, which will ensure 24x7 access to power in rural areas. Additionally, large-scale and transparent procurement has led to a notable decrease in the cost of LED bulbs. In rural areas, street and household lighting are amongst many essential requirements towards a better livelihood and

1. Tushar Gupta.

2. Anirudh Kajaria.

3. VP Mahendru.

4. Jayanth Jain.

5. Vibhor Sogani.

6. LEDs and 2,000 mirror finished steel spheres make for a mesmerising light installation by Vibhor Sogani.



advancement. Installation of LEDs in rural areas is a far more sustainable choice due to its longevity. This evolution is driven by a cumulative number of government initiatives for energy conservation, rising consumer awareness about energy-efficient products, and innovative products offered by the industry that are in sync with the overall trend of digitisation.

**VP Mahendru:** The future of LEDs in the rural areas is as bright as it is in the towns, if not more. Last year, the Honourable Prime Minister launched a Rs.16,000 crore scheme, Saubhagya, offering free power connections to village homes across the nation that are still without access to electricity. Coupled with the UJALA scheme, targets for replacing around 770 million incandescent lamps with LED bulbs is already on the anvil. Clearly, the future of LEDs couldn't have been brighter in rural areas.

**Jayanth Jain:** India imports more than 70% of its oil and natural gas and relies on coal for more than half of its electricity generation. With economic growth comes demand for more consumption, and this is where LEDs changed the spending scenario in rural areas. The LED technology has brought plenty of new replacement products from the primitive incandescent lighting used in rural areas. LED technology, on the whole, effortlessly replaces the old lighting products. It is going to be an illuminating future here on, given that LEDs are among the most energy-efficient lighting sources, and last longer than other light bulbs. An LED bulb can cut energy consumption by over 80% when compared to conventional light bulbs and can last up to 25% longer. The sustainable technology innovation wave has just begun, and there are gradual improvements in resource productivity that are contributing towards sustainability.

#### Can old sources of lighting be totally replaced with LED technology in retail, industrial and residential applications?

**Gupta:** Today, almost all applications of traditional lighting are replaced by LED lighting. Whether it is retail, industrial or residential, almost all of the range has been replaced by LEDs. In the residential segment, major products are lamps, battens and panels, for which LED replacements are widely available. In the industrial segments, the major products are highbays, well-glass, tube lights and industrial battens, where all have been either retrofitted or replaced by LED products. Similarly

in the retail segment, all major products such as spot lights, track lights, etc, have been replaced by LED products. We at NTL Lemnis have more than 250 products primarily targeted at each of these segments.

**Kajaria:** The prospects of LED lighting industry is purely driven by aspirational needs of the contemporary world. While there is a requirement for a smarter and more connected lifestyle, the rising consciousness towards energy efficiency also paves the way for a great future for LED lighting industry. The evolution of customer preference is (impacting) LED lights. Residential applications of these lighting options, preferably bulbs and battens, come with better lumen quality and extended longevity. There are products which are specially made for retail. Showrooms also use different lighting fixtures like COB (chips on board) and spot lights. High wattage LED bulbs have already been introduced in the market, which replace CFLs in the smaller shops. In addition to this, LED lighting solutions can be used effectively in outsized industrial spaces as even-illumination speeds up production and helps avoid on-the-job mishaps. Technological advances in this sector, along with low-cost maintenance, helps in smooth functioning at work. These LED lighting fixtures can enhance the overall lighting experience coupled with the convenience of longer life and improved aesthetics.

**Jain:** The influence of LED lighting in the contemporary world is endless. The LED technology has brought plenty of new replacement products from the primitive incandescent lighting. LED lighting provides up to 75% energy saving with instant start and without any flicker. They are environmentally friendly, non-toxic, lead and mercury free. This technology, on the whole, effortlessly replaces the old lighting products from industrial and residential applications. One of the most important features of LED is the lumen output – or brightness, in simple terms, that doesn't decrease or depreciate with LED as opposed to fluorescent technology. Industrial lighting consumes more energy, and this is where LED comes as a saviour.

**Sogani:** LEDs have matured and the brands dealing with them have been working towards what we call 'technically zero defect' modules which don't fail as much, are easily available and the costs more palatable. In my opinion, LED technology has the potential to replace old sources of lighting in various applications and environments. **66**

7. LED lights, such as Workstation LED lighting by NTL Lemnis, are consistently replacing its old alternatives.