Government Policies and Street-Lighting Boost Demand for LED Lighting

The Indian market for LED lighting has demonstrated a steady growth in last couple of years. Street-lighting, and industrial and commercial applications are propelling the market in India today. Government's support to green technologies, too, has encouraged the adoption of LED lighting in India. In this report, we look at the LED industry in depth

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India is a country where a major chunk of population is still not connected to the power grid. In order to supply power to them, India will need to create either newer sources of power or reduce the power demand by implementing energy-efficient devices at all levels. "It has been estimated that, in India, lighting systems consume 18 per cent of total power consumption, which is considered high when compared to other countries, where lighting consumption is approximately 12 to 14 per cent," informs Pankaj Raushan, senior research analyst, MarketsandMarkets. Due to this, light emitting diode (LED) has emerged as an important energy-efficient device, especially for lighting systems.

LED commercial lighting

LED lighting industry growing at CAGR of 40 to 50 per cent

For financial year 2013-14, the lighting market was estimated by the industry to be around ₹ 20 billion, informs Puneet Dhawan, senior vice president and head of lighting business, Orient Electric. He says, "The percentage contribution from LED industry to the total lighting industry is hardly 14 to 15 per cent." He adds, "For the past two years, LED industry has been growing at a compound annual growth rate (CAGR) of 45 to 50 per cent and will continue to grow at that rate for the next three to four years. The prediction is that, four years from now, contribution from LED industry will be more than 50 per cent to the total lighting industry."

On a similar note, Raushan says, "LED lighting market in India is estimated to cross US$ 3 billion by 2020, growing approximately at a CAGR of 40 per cent. This will help LED lighting market to account approximately 55 to 60 per cent of the total lighting market in India by 2020."

Energy conservation, decreasing cost and commercial applications driving demand

The shift toward renewable energy, demand for energy-efficient products and LED luminaries has increased. Several technology features of LED, like long lifespan, energy-saving capacity [which is more than 50 per cent as compared to compact fluorescent lamp (CFL)] and

LED street-lighting

Technology-wise, it is OLED, solar and wireless LED

Here are some technological trends emerging in the LED space:

Colour-changing LEDs. "One key trend is the development of LED lights that can produce any light within the visible spectrum. Philips is the first to introduce such LED bulbs, which can change the colour of light," notes Raushan. With the help of an app, the consumer can control the colour of LED.

Wireless-bonded LEDs. Development of wireless-bonded LED technology can be considered to be another latest technology trend with regard to LED lighting market. Raushan says, "Wireless-bonded LED technology is also referred as flip-chip. It provides benefits such as improved durability, better heat dissipation and longer life."

Wireless LEDs. Modern buildings being constructed today comprise lighting arrangements with daylight, occupancy and time scheduling on/off sensors. "Similarly, many upcoming LED road lighting systems call for wireless operability, daylight and on/off scheduling," says Lalchandani. The new LED lighting systems (both for indoor and street-lighting) need to be designed to seamlessly integrate and work with these sensors and control systems.

OLEDs. There is a new trend of solar LED lights being used to provide low-cost lighting in rural households. "The newest technology trend observed in the LED market is the organic light emitting diode (OLED) technology. OLEDs are LEDs manufactured from polymers with a liquid crystal display (LCD) glass covered with indium tin oxide (ITO) and polymer materials applied by ink jet printing," informs Lahiri.

absence of toxic materials, are other major driving factors that make LEDs more affordable and growth-driving, informs Harmeet Singh, technical lead, Analogue Applications, TI India.

"The average lumen efficiency is much higher for LEDs when compared to incandescent lamps and CFL lamps," notes Swetanta Lahiri, research analyst, Netscribes. Energy conservation is driving demand in the LED sector. With LEDs, you can save approximately 80 per cent of energy as compared to normal lighting devices.

LEDs have a longer life in comparison to normal lighting devices or even CFLs. Dhawan informs, "In general, life of an LED is approximately 25,000 burning hours, whereas ordinary lights last around 1000 burning hours and CFLs around 5000 to 6000 burning hours. Consumer's demand is driven by the fact that once he or she has used LEDs, extra costs for maintenance or replacement will not be incurred for a long period of time."

Awareness with regard to energy-saving has a huge impact on the development of energy-efficient lighting systems such as LED light bulbs. "People are now more inclined toward buying LED light bulbs instead of CFLs or other inefficient light bulbs. This is further being supported by the declining prices of LED light bulbs," says Raushan.

Government policies are helping

The Indian market for LEDs has shown a steady growth and increasing demand over the last couple of years, thanks to the initiatives taken by the government. "Newly-formed government in India has emphasised that each and every house should have a light bulb by 2019, creating huge demand for power by 2019. This has led to the requirement of energy-efficient lighting systems such as LED light bulbs," says Raushan.

Street-lighting, and industrial and commercial applications are boosting the market in India. Government has also emphasised that all street lights in public places should be replaced with LED light bulbs, encouraging the adoption of LED lighting in India. Street-lighting has huge scope for energy-saving that can be achieved with the implementation of LED light bulbs.

The largest segment driving LED adoption is the street-lighting segment, informs Harish Lalchandani, country head, GE Lighting. He says, "In a bid to cut energy costs and increase the quality of light toward enhancing town and pedestrian safety, the government is pushing conversion of all street lights to LED. According to ELCOMA reports, there are about 27.5 million street-lighting points in India that will be converted to LED in a phased manner."

Government has taken several other steps to ensure the implementation of LED at all levels. "Recently, the government of Andhra Pradesh has announced that it will be distributing LED light bulbs to 3.7 million households in Andhra Pradesh at a cost of ₹ 10 (US$ 0.16 approx.), which usually cost approximately $6," informs Raushan.

LED standards were published in 2012, which brought in a large-scale lighting revolution in India, shares Lahiri. He says, "Customs duty on LED was reduced from 10 per cent to 4 per cent as part of government of India initiatives."

Government is also kick-starting demand in the domestic segment, notes Dhawan. He says, "Government, through its energy-development agencies in various states, is promoting a lot of projects where they are going to replace the existing lighting systems with LED. In the last one year or so, I have seen a lot of such projects coming up and agencies being set-up by the government."

Power Ministry has also intended to provide LED technology under Rajiv Gandhi Grameen Vidyutikaran Yojana (RGGVY) initiative. Raushan says, "Government has intended to replace all street-lights and lights in public places with LED light bulbs. It has modified all CFL distribution scheme into LED distribution. All government departments have been asked to procure only LED light bulbs instead of incandescent bulb and CFL light bulbs." He adds, "All this development is expected to drive the demand, as well as awareness, amongst the consumer regarding LED light bulbs."

Talking about how the Ministry of Power played an important role in promoting the use of LED lamps under RGGVY scheme, Lahiri says, "Railways have already started using LEDs in different utilities, such as traffic signals and railway coaches."

Finally, government of India initiatives like 'Bachat Lamp Yojna' and 'LED

Village Campaign' are also promoting LED usage in street-lighting, informs Singh.

Notable market trends

An interesting market trend which has been observed is that, the demand for India-made LED light bulbs is higher when compared to imported LED light bulbs. Raushan says, "Imported LED light bulbs do not have the electronics to withstand Indian electrical systems and, thus, do not work for very long. LED manufactured in India has good reliability and provides better after-sales services, which is not the case with imported LED light bulbs." He adds, "Although LED imported from China is cheaper, it is of bad quality and does not last long, and thus people prefer Indian LED light bulbs." On a similar note, Dhawan says, "Government should help the industry by restricting cheap, imported products that actually harm consumers as they are not in line with the quality and safety requirements."

Some other recent trends in the market include price reduction and shift toward manufacturing of low- and mid-power LEDs. LED lights are extensively used in automotive lighting, too. "The use of LED lamps in digital signage is another trend that has been observed," informs Lahiri.

As the LED street-lighting segment is becoming more mature, newer risk-sharing models are being explored between municipalities and lighting solution providers. Lalchandani says, "Some of these risk-sharing models comprise deferred payments, longer warranties, special-purpose investment for large investments and annuity based payments." He adds, "Nowadays, many customers also seem to be looking up at lighting solutions companies as one-stop-shop providers, who can offer end-to-end solutions right from design, installation, testing, and commissioning and financing."

LEDs are preferred over CFLs and tubelights for new installations

"We have observed that most people today, who are going for new installation in offices, homes, industries, factories and other commercial spaces, prefer to go for LEDs. It is slightly costly when compared to normal fluorescent lighting or even high-pressure sodium vapour lights for outdoor lighting," says Dhawan. He adds, "But the payback period, which is between two to three years, is so attractive that for any new installation, people are ready to shell out money on LED installation rather than the conventional lighting." Majority of the new installations, be it residential or commercial, are opting for LED lighting today.

Another aspect of this trend is the retro-fitting or replacement of LEDs. There are a lot of campaigns and activities that create awareness on the benefits of LED, even while replacing CFLs or other lighting. "Retro-fit is little slower as the initial cost is higher due to replacement of old fixture with new ones for LEDs," informs Dhawan. The latter is a slower process comparatively, but both are catching on.

Pricing trends

Despite the fact that LED provides huge energy-saving, LED market is not as large in India as it should be. This is mainly due to the fact that cost of LED lighting is much higher than that of traditional light bulbs. Raushan says, "Due to recent development with regard to manufacturing of LEDs in India, improvement in technology and competition, price of LEDs has reduced to a large extent. It has been estimated that by the next two to three years, price of LED light bulbs will be reduced by 50 per cent, but still its cost will be higher than that of traditional light bulbs."

However, with awareness about energy-saving, application of LED lighting has increased, thus pushing down prices of LED light bulbs. "In India, in 2010, one LED lamp cost approximately ₹ 1200, which now in 2014, costs around ₹ 400 ," informs Raushan. It has been observed that, with the development and improvement in the manufacturing technology, cost of LED light bulbs has decreased almost 30 per cent in the last couple of years. This has also forced the local manufacturers to develop low-cost LED light bulbs.

Singh notes, "The price of an LED bulb of 5-7 watts, with power factor greater than 0.9 and total harmonic distortion lesser than 20 per cent, which was ₹ 400 in 2012, has reduced by 50 per cent." He adds, "Products that were once available for more than ₹ 400 in

Challenges faced by the industry

- Lack of awareness regarding LEDs makes it difficult to scale-up business for the mass market
- Inefficient LEDs imported from China resulting in huge competition
- High cost of manufacturing; return on investment (ROI) made in tools in India is very low
- Lack of standards and LED testing facilities
- Heavy dependence on import of LED-related electronic components
- Lack of skilled manpower

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2012 are now available for 50 per cent less." Luminaries in other categories or application areas have witnessed a similar reduction in price in India.

Dhawan believes, "Within a year or two, we should see the price of an LED lamp almost comparable to a normal CFL lamp or fixture."

Recommendation from the industry

Government is actively participating in promoting the LED segment, notes Dhawan. Street-lighting is one of the major applications of electric power in India. He says, "By helping municipalities of the civic authorities to have this perception and mindset change of transitioning from energy-guzzling, high-voltage sodium lights to LED, which at one-fourth the wattage can give you the kind of lighting experience in terms of light availability on the roads is actually a key area for the government to work upon."

Dhawan also says, "We expect the government to come up with regulations to help the Indian LED industry to set-up manufacturing of these products in India."

Lahiri believes, "There is still need for a stronger institutional mechanism. It is necessary to enable testing of LED products through the development of common testing protocols."

LED will need government support and R&D facilities to boom in future

Development of LED lighting market in India is primarily dependent on government and industry bodies, at least for the short-term duration. Once there is price rationalisation, demand for LED lights is expected to get a big boost, believes Raushan. He says, "Industry needs to develop its own R&D facilities, which help in the development of electronic components for LED lights. This is expected to reduce the cost of manufacturing." He adds, "Industry also needs to tackle substandard LED lights procured from Chinese market, which is hampering the LED market." This develops a negative marketing with regard to LED lighting systems. Industry should work toward reducing the import of materials required for the development of LED lights.

Lahiri also believes that the industry should look toward building strategic partnerships to obtain quality input at the right price. Developing an efficient distribution network, that can handle different segments such as enterprises, consumers and government bodies, would help the industry grow. He says, "Another important step is brand-creation in order to influence enterprises (B2B) and consumers (retail sales) for sales." Engaging in the development of innovative designs and improvements in product efficacy would give a push to the Indian LED market. ●

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