LED BAZAAR
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LED streetlights brightening India's sustainability plans

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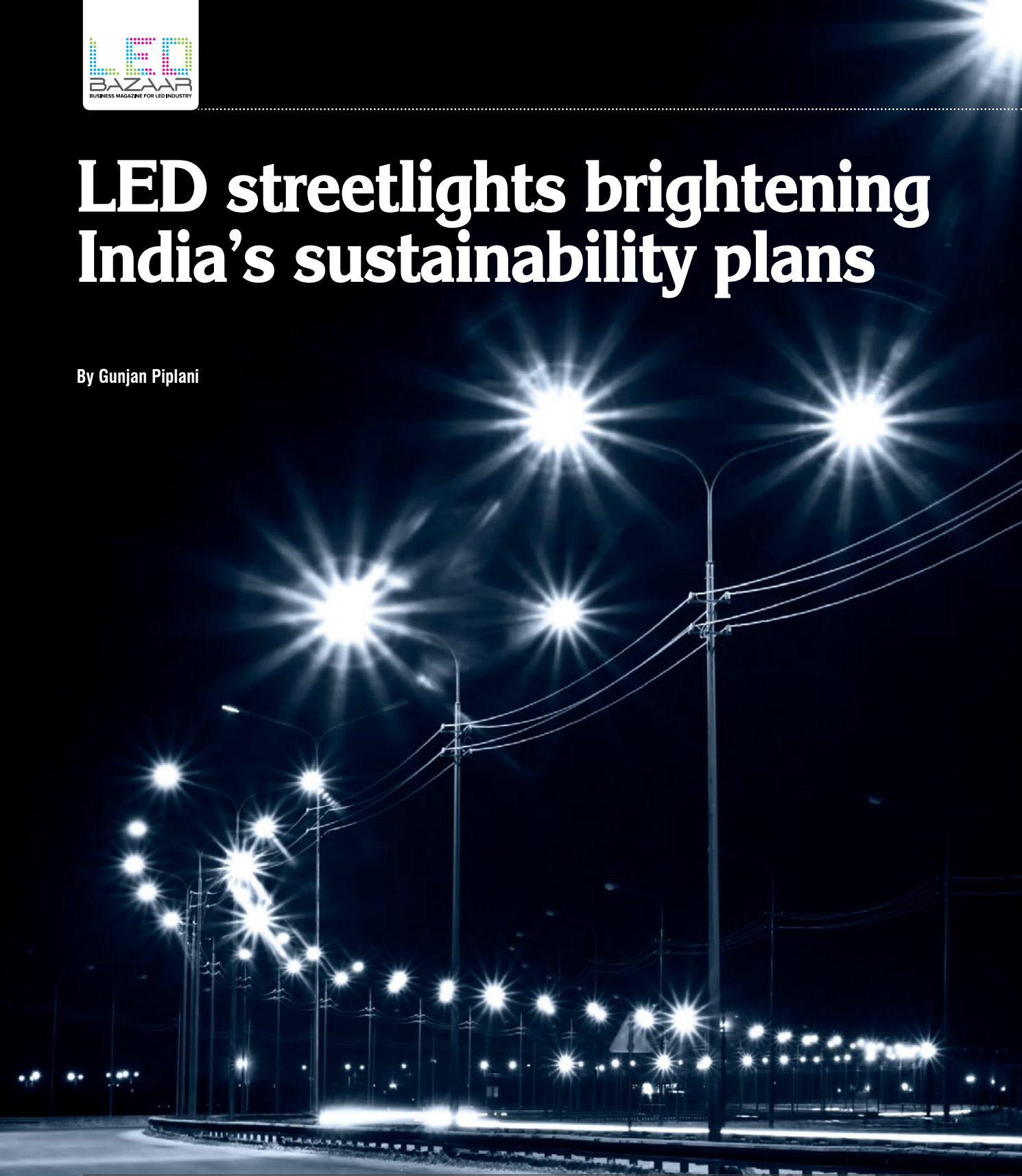

With the government planning to develop 100 smart cities in India, LED streetlights are slated to emerge at the forefront of India's drive towards energy conservation. Little wonder that the products being developed today are more efficient, last longer and come with the necessary controls

The LED streetlight market has come a long way, and is playing a major role in showing potential users how they can benefit from it in the long term. Street lighting is becoming one of the key applications in India's LED lighting market.

According to the latest report by 6Wresearch, India's nascent LED lighting market is projected to reach a turnover of US$ 2.2 billion by 2021. The major drivers of this growth will be the government's initiatives to replace incandescent bulbs with LED bulbs in homes as well as the smart cities project under which LED streetlights will be installed.

The numbers and market research clearly predict a bright future for the LED street lighting industry as different cities across India will soon begin replacing sodium vapour lamps and incandescent bulbs with LED lights.

Technology upgradation is the key

LED streetlights are designed for specific requirements, for which they need to be efficient, have a longer life, withstand extreme weather conditions and save energy. Hence, product development is focused on efficiency, wherein the lumens output, longevity, thermal management and control systems are key. With time, technology has evolved from discrete/emitter LEDs to chip-on-board (COB) based LEDs.

Talking about the demand and the changing technology scenario, Puneet Dhawan, senior vice president and business head-lighting business, Orient Electric, says, "Currently, IP65 streetlights with discrete LEDs and pressure die cast (PDC) housings are more commonly being asked for. However, as the technology advances, we foresee a shift from discrete LEDs to COB LEDs and from PDC housings to extruded housings. The shift from PDC to extrusion, a modular concept, will be faster owing to the better heat management and lower tooling costs associated with the latter. This becomes more important in the Indian context, as it brings down the turnaround time for new designs and reduces the dependence on imports."

And according to Rajesh Naik, GM–luminaires-lighting division, Crompton Greaves Ltd, "With good thermal management in product design the life of these lights have increased. The life lights has now increased to 50,000 hours as against 15,000 hours in the early days of LED technology development."

MAJOR BUYERS

- Municipal corporations
- PSUs
- Railways
- Educational institutions
- Housing societies
- Defence institutions
- NHAI (National Highway Authority of India)
- Corporates

REASONS FOR INEFFICIENT STREET LIGHTING SYSTEMS

- Selection of inefficient luminaires
- Poor design and installation
- Poor power quality
- Poor operation and maintenance practices

FACT

By replacing all high-pressure mercury vapour lamp fittings in streetlights with high-pressure sodium vapour lamps with slightly lower wattage, savings of 20-25 per cent can be achieved.

Source: Bureau of Energy Efficiency (BEE)

CERTIFICATIONS

- **IES LM-79:** Luminaire: Electrical and photometric measurements of solid state lighting products
- **IES LM-80:** Method for measuring lumen maintenance for LED light sources
- **IS 10322:** For general safety, insulation resistance, high voltage, overvoltage protection, environmental tests, endurance tests, etc.
- **IS 1944:** General illumination requirements for the road
- **IS 16104:** Performance requirements for electronic control gear for LED modules

Rajesh Naik,
GM - luminaires, lighting division,
Crompton Greaves Ltd

Puneet Dhawan,
senior vice president and business
head-lighting business, Orient Electric

Shiv Nath,
CEO,
Moser Baer India Ltd (MBIL)

Crompton Greaves has recently launched COB based LED streetlights. While the market standard is 80-90 lumens/W, the new product offers efficiency of 100 lumens/W with an additional 10 per cent saving on power consumption, Naik adds.

LED streetlights have also gone a notch higher when it comes to being energy efficient, since they are now solar energy compatible and come with dimming capabilities. These features are gradually making LED streetlights broadly self-sufficient as they get recharged through the solar panels during the day and use the energy gained in the night. The dimming capabilities ensure that there is no wastage of electricity when there is no requirement for lights. These LEDs get turned on when they sense movements.

With respect to what's being done on the product development front, Shiv Nath, CEO, Moser Baer India Ltd (MBIL), shares, "LED streetlight solutions are completely electronic in nature. Hence, they provide opportunities for many innovations like auto on/off, dimming, remote sensing of product performance, etc. This will help enormously in preventive maintenance and increase energy savings."

The energy-saving and control capabilities of the product also help in monitoring the health of every streetlight.

Automation in LED street lighting: Photonics Watertech, a company that offers LEDs and control systems, has recently introduced an intelligent streetlight controller (SLC) designed for energy-saving in conventional streetlight systems. The controller incorporates a real-time clock with an in-built battery and a minimum life of eight years in Indian

The benefits particular features offer to consumers

Features	Benefits
Proper pole height and spacing	• Provides uniform light distribution, which improves appearance, safety and security • Meets recommended light levels • Minimises the number of poles, reducing energy and maintenance costs
Proper luminaire aesthetics	Blends in with the surroundings
High lamp efficacy and luminaire efficiency	Minimises energy costs
Long life of the luminaire and other components	Reduces lamp replacement costs
Cost effectiveness	Lowers operating costs
High lumen maintenance	Reduces lamp replacement costs
Good colour rendering	• Helps object appear more natural and pleasing to the public • Allows better recognition of the environment, improves security
Short lamp restrike	Allows the lamp to quickly light up again after a power interruption
Proper light distribution	Provides required light on the roads and walkways
Proper cutoff	Provides adequate optical control to minimise light pollution
Minimising light pollution and glare	Reduces energy use
Automatic shut-off	Saves energy and maintenance costs by turning lamps off when not needed

Source: *Bureau of Energy Efficiency (BEE)*

CROMPTON GREAVES' LED STREETLIGHT

- Ingress Protection (IP): IP 65 & IP66
- High power factor: > 0.95
- Suitable for atmospheric conditions ranging from -10 to 50 degrees centigrade
- Protection against high voltage surges ranging from 5KV to 10KV
- Reduces energy costs by 40 per cent
- Colour temperature: CCT 2700K to 6500K

PHOTONICS WATERTECH'S STREET LIGHT CONTROLLER

- Switching: Promotes timely switching on/off of streetlights
- Lighting: Discovers number of lamps operating and ascertains total operating hours of lamps
- Faults: Reports range of faults like failed (exhausted) lamp, lamp cycling, faulty power factor, mains failure, under/over voltage, fuse condition and gear faults
- Real-time recording: Controls on/off times of the lighting through a data concentrator
- Records any manual intervention and on/off switching times
- Energy: Displays total energy consumed at predefined intervals
- Alarm: Facilitates an alarm to the user in case of lamp failure, ballast failure and ignition failure

conditions. There is no need to reprogram the controller even if the electricity supply fails for a long period.

SLCs help in streetlight management. Lights can be controlled over the Web and mobile, with longitude/latitude based switching on/off, energy tracking and planning, and monitoring of the energy consumed. The user can monitor faulty streetlights and implement an effective fault repair and servicing system.

Opportunities galore

LED streetlights will offer substantial business opportunities in the long run for lighting companies, primarily because of the government's '100 Smart Cities' programme. LED street lighting systems will be a key contributor in this programme, ensuring greater returns through turnkey projects.

According to the report by 6Wresearch, Central and state governments are replacing the traditional sodium vapour streetlights with LEDs in several ongoing pilot projects across cities and states including Chandigarh, Delhi, West Bengal, Maharashtra, Andhra Pradesh, Gujarat, Uttarakhand and Punjab.

"The LED bulb distribution scheme announced by the prime minister is a significant push by the government. This initiative has changed the perception of an LED being a high cost product for the consumer. The LED industry in India has been growing by 50 per cent year-on-year. This move will encourage new consumers to adopt LED technology, and benefit from the recurring returns from energy savings and the long life that LEDs offer," says Dhawan.

Apart from government requirements, a lot of corporates, educational institutes and private housing societies are now embracing the idea of sustainability and are moving towards renewable energy generation methods. So, the need for products that consume less power, are easy to maintain and have a longer life compared to the traditional systems, has increased.

Making a purchase decision

Purchasing products like LED streetlights needs considerable thought as the investment being made is high. The areas which should be looked into include product quality, its life, efficiency, capability to withstand extreme weather conditions, maintenance and after-sales support.

Sharing his views, Nath says, "Generally, buyers focus on products only. An excellent product does not necessarily provide proper illumination on the street. Hence, street lighting system design is very challenging. Consumers should look at products, the road width, type of road, optimum mounting height, illumination level (lux level), uniformity of illumination, minimum/maximum uniformity, minimum/average uniformity, glare evaluation and many other aspects." Moser Baer employs specialist designers for various stages of streetlight systems design.

Says Dhawan, "The purchase decision should depend on a product's thermal management, driver reliability, correlated colour temperature (CCT) of the LEDs, and protection against unwanted circumstances such as surges and interferences from lightning during inclement weather."

Maintenance - the last lap

Players in the LED streetlight business are setting up local centres in order to be able to provide after-sales services to the installed LED streetlights as soon as possible.

While Orient Electric ensures the turnaround time is limited to 48 hours at most of the locations, Crompton Greaves, through its authorised service centres staffed with skilled technicians, attends to complaints within 24 hours in all major cities.

Moser Baer has an Inernet based customer feedback management system, which helps consumers to provide feedback on product performance in the shortest possible time.

With continuous R&D and product development, the LED streetlight business in India is only going to grow brighter, and will continue to be a major contributor to India's LED lighting business.

ORIENT ELECTRIC'S FIESTA STREETLIGHT

- Ingress Protection (IP): IP 65
- Lumen output: 3000 lumens
- Colour temperature: CCT 5000K
- CRI: >70
- Designed with thermally managed aluminium pressure die cast housing

MOSER BAER'S LED STREETLIGHT 65W

- Lumen output: 5200 lumens
- Working temperature: -20 degree centigrade to 50 degree centigrade
- CRI >70
- Colour temperature: CCT 6000K
- Ingress Protection (IP): IP 65