

INNOVATING ENERGY

India's LED lighting success: Enabling benefits to the citizens of India

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Editor's note

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Brightening India, the LED way

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India must continue its impressive domestic LED growth story, aim for global leadership

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Energy-intensive steel industry looks to push consumption, reduce emissions

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Editor's Note

Dear Reader,

Sustainable lighting is essential to a nation's growth and prosperity. India has led the way in creating a sustainable and energy efficient lighting infrastructure, in homes and outside, by the way of LEDs. LED lights have emerged as a viable lighting alternative in the last few years, reducing the dominance of traditional lighting like fluorescent and incandescent lights. LEDs are known to emit light up to 90% more efficiently than incandescent light bulbs and 80% more efficiently than CFLs, thereby saving both energy and electricity costs. With their myriad of benefits, both in terms of power and money, LED lights have completely transformed the lighting industry.



In this newsletter, themed around **India's LED lighting success: Enabling benefits to the citizens of India**, we seek to explore this very pivotal component of India's climate and developmental ambitions, with insightful and varied perspectives from a host of industry leaders. 'Energy-Efficient LEDs & its impact on environment' explores the linkages between LEDs and environment and makes a case for ramping up the use of LEDs and other energy efficient solutions. 'The energy-efficient lighting sector must grow parallel with core industries like steel' deep dives into the need for steel companies to make carbon footprint reduction an integral part of their operations and corporate policies. In 'Brightening India, the LED way' we discuss India's LED journey, and the various initiatives that have helped India in becoming a leader in the LED space. We then shine the spotlight on how LEDs have given a boost to India's exports, employment, and economic growth, and have put the country at the forefront of the global transition to energy-efficient lighting, in the article 'India must continue its impressive domestic LED growth story, aim for global leadership.' Finally, in 'Energy-intensive steel industry looks to push consumption, reduce emissions,' we look at the need for reduction of emissions by the steel industry, and the role energy efficiency can play in that regard.

We have already seen the remarkable impact of LEDs widespread adoption in India. Now, with the integration of emerging technologies into the lighting sector, we are witnessing a new era of smart LEDs. India's path to increased energy efficiency and reduced emissions can only be paved by the proliferation of LEDs in the country.

Abhishek Gupta

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Energy-Efficient LEDs & its impact on environment

According to IEA's energy outlook, India's energy use has doubled since 2000, with 80% of demand still being met by coal, oil and solid biomass. This rising demand will require interventions on a massive scale and increasing the efficiency of energy use is the most feasible and affordable alternative. India has emerged as a global leader in leading the charge against rising emissions with its visionary five-point agenda, as outlined during COP26. Thus, improving the energy efficiency of the nation gains greater importance.

Currently, India has the world's largest energy efficiency portfolio and has built a robust ecosystem for stakeholders across diverse sectors. Energy efficiency interventions such as the Unnat Jyoti by Affordable LED for All (UJALA) has brought down LED prices to almost a tenth of market prices and has helped reduce energy usage considerably. The Light-Emitting Diode (LED) is one of the most energy-efficient and promising lighting technology in the world. LEDs have longer life spans, are more durable, and offer superior light quality than other types of lighting. LED bulbs have outstanding operational lifetime expectation of up to 1,00,000 hours. This is 11 years of continuous operation, or 22 years of 50 % operation.

India has been a forerunner in LED adoption, with its highly successful UJALA programme. LEDs in India have resulted in estimated energy savings of 48.30 billion kWh per year with avoided peak demand of 9,769 MW. However, the most significant impact has been on the environment, with GHG emission reduction of 39 million t CO₂ per year. LEDs offer myriad of benefits to the environment and are the most efficient way of illumination and lighting, with an estimated energy efficiency of 80% - 90% when compared to traditional lighting and conventional light bulbs. They are also free of toxic chemicals, while most conventional fluorescent lighting bulbs contain a multitude of materials like mercury that are dangerous for the environment. LED illumination also produces little infrared light and close to no UV emissions.

Thus, it is critical for us to continue ramping up the use of LEDs and other energy efficient solutions. Recognising the need for encouraging Energy Efficiency, especially in the MSME sector for their survival and growth in the long run, SIDBI has taken a gamut of initiatives through dedicated loan products and other promotional activities. SIDBI has been operating focused concessional lending schemes for energy efficiency and cleaner production from various multilateral/ bilateral agencies. SIDBI is also providing risk capital and equity support for innovation projects related to energy efficiency, cleaner technologies and renewable energy. Our implementation assistance to MSMEs has resulted in energy efficiency investment of ₹330 crore and a reduction in CO₂ emission by 2.55 million tonne.

SIDBI has been and will continue to be a strong proponent and enabler for the development and adoption of energy efficiency in India.

Anand K Yadav

AGM
SIDBI, Bhopal



The energy-efficient lighting sector must grow parallel with core industries like steel

India's climate action goals, which include achieving net zero emissions by 2070, are hugely significant in the context of the growing worldwide concerns about the generation and usage of energy. As one of the world's biggest economies and a guiding light for other developing countries, the onus is on

India to meet its ambitious goals for growth and development in a sustainable manner. India is well positioned to pioneer a new model of economic development that avoids carbon-intensive approaches and embraces energy efficiency. Indeed, energy efficiency, which the International Energy Agency once called "the first fuel", will play a very important role in determining how successfully India addresses its energy challenges.

There are several policy measures in place already; they just need to be implemented well and with a vision for long-term success rather than short-term gains. Meanwhile, robust, government-backed energy efficiency programmes, such as those being implemented by EESL, have achieved admirable success over the years in reducing the energy used by and emissions arising from sectors such as buildings and transportation, and other major industries.

Industries, on their part, should also look to improve energy efficiencies and adopt low-carbon technologies themselves. Today, there are technologies that can help in decarbonizing even the hard-to-abate, energy-intensive sectors such as iron and steel. Adopting them can not only reduce the cost of production but also help in meeting environment goals and regulatory requirements. The simplest among them involve not the core industrial processes but building-related measures such as better insulation and energy-efficient lighting, both of which have significant energy-saving potential.

It is commendable that EESL and MECON are working together to devise energy efficiency and resource conservation measures for the steel and mining sectors. Among the solutions they are working on is retrofitting existing buildings, systems and structures with LED lights and installing super-efficient AC systems and technologies that improve indoor-air quality.

SAIL is aware of and sensitive to the concerns around climate change and has made carbon footprint reduction an integral part of its operations and corporate policies. In February last year, the company signed an MoU with EESL for conducting an energy audit of SAIL's corporate office in New Delhi. SAIL has also won the Golden Peacock Environment Management Award for three successive years, most recently in 2021.

Among the many other initiatives that the company is undertaking to reduce its carbon footprint, SAIL is gradually shifting to LED lighting in all its facilities. The company's focus on energy conservation is not something new; it goes back many years, even before the climate change issue had reached the worrying proportions of today. SAIL's Bhilai steel plant had won the National Energy Conservation Award in 2013 and 2014 for efficient utilization and savings of thermal and electrical energy consumption.

It is clear that energy efficiency, through technology, processes and lightings, will become increasingly important elements of India's energy story in the coming years. Every company should do its best to write a chapter it can be proud of.

Mukesh Gupta

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Brightening India, the LED way

Illumination is one of the most pivotal needs of a society. It is an enabler of the development of a nation, facilitating connectivity, trade, education and safety. A thriving lighting infrastructure can propel positive evolution of a nation, from a social, economic and cultural standpoint. However, it is also crucial for lighting to be sustainable and ecologically viable. It needs to synergize with the SDGs of a nation, especially through the parameters of cost and energy efficiency. India

has been one of the frontrunners in recognizing the need for a sustainable and energy efficient lighting infrastructure, at both personal and national level by promoting the use of LEDs.

LEDs are vastly more energy efficient than their traditional counterparts. They emit light up to 90% more efficiently than incandescent light bulbs and 80% more efficiently than CFLs. This efficiency is due to that fact that LED bulbs require significantly less wattage than incandescent or CFL bulbs. In fact, according to reports, fluorescent lights waste 95% of their energy as heat and only use 5% to actually generate light. Conversely, LED use 95% of their energy to emit light, clearly highlighting their considerably superior utility.

An important breakthrough in India's efforts to reduce emissions and move towards a cleaner energy ecosystem, has been the proliferation of LED bulbs in India. The LED market in India was in its embryonic phase, just a few years ago, albeit with massive untapped potential. Recognizing this opportunity, the government launched its domestic lighting programme - Unnat Jyoti by Affordable LEDs for All (UJALA) in 2015. This programme sought to address India's high cost of electrification and high emissions from inefficient lighting. UJALA, which was implemented by Energy Efficiency Services Limited (EESL), has single handedly created a market for energy efficient LED bulbs in India, bringing down the cost of LED bulbs from INR 310 to INR 38. This was truly transformative, leading to large scale adoption of LEDs.

UJALA has been vital in making the use of the most efficient lighting technology at affordable rates for the domestic consumers, the new normal and has benefitted them by way of reduced energy bills. UJALA has also enabled a wave of awareness for consumers around the utility of using efficient appliances, leading to a marked shift in their buying preferences from low first cost-based purchases to lifecycle cost. Furthermore, with the rise of demand for LED bulbs, the domestic lighting industry has received a significant impetus.

The proliferation of LEDs in India has acted as the harbinger of positive social, economic and ecological change, improving the quality of life of its citizens, generating prosperity in local communities and providing increased energy access to all.

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