



From Darkness to Light



 **UJALA**



“ The country needed something that consumed less electricity, was brighter and less costly. This need gave birth to the UJALA scheme. Necessary steps were taken to promote LED manufacturing. Policies were changed. This reduced the price of the bulb and once people experienced its benefits, the demand also increased. The UJALA Scheme has completed 5 years yesterday itself. It is a matter of immense satisfaction for all of us that more than 36 crore LED bulbs have been distributed throughout the country. ”

- Prime Minister Narendra Modi, 6th January 2020

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A | UJALA - The revolutionary story of household lighting in India

Unnat Jyoti by Affordable LEDs for All (UJALA), a path-breaking initiative by the Government of India, aimed at bringing light in darkness, has ushered in a new technology, namely Light Emitting Diode (LED) to crores of homes in India leading to a LED revolution in the country. A 7W LED bulb provides same amount of light as a 14W Compact Fluorescent Lamp (CFL) and a 60W Incandescent Lamp (ICL) and thereby saves almost 90% energy as compared to ICLs and 50% in case of CFLs. LED bulb consumes 1 unit of electricity when it is used for 140 hours as compared to 2 units by CFL and 9 units by ICL.

The cost of operating LEDs is the lowest as it costs INR 4 for 140 hours in comparison to INR 8 for CFL and INR 36 for ICLs over the same period. The cost of ownership for a LED bulb is around INR 12 per year, lowest as compared with CFL at INR 40 and for ICL at INR 108. The cost of ownership per year of LEDs is less than one-third of a CFL and one-tenth of ICL.

Despite these significant benefits and efforts to promote efficient lighting in the past, there were barriers and challenges that prevented large scale adoption of LEDs. Some of the key barriers and challenges were:

- High first cost of LEDs as compared to ICLs and CFLs to enable households make purchase decisions to buy LEDs
- Lack of awareness amongst stakeholders and households about the reduction of electricity bills by use of LEDs
- Low appreciation of policy makers at state and DISCOM level about the benefit of incentivizing efficient lighting to reduce peak demand and thereby improving their financial position.

B | Numerous barriers, one solution - a unique business model

Ministry of Power, Government of India, directed Energy Efficiency Services Limited (EESL) in 2014, a public sector entity under its administrative control, to take steps to scale up the use of LEDs in India. The retail price of LEDs at that time was about INR 450-500 each in comparison with CFL (at INR 100-150) and ICLs (at INR 10-15) that was limiting its use. The share of LEDs in the lighting market was less than 1% in the year 2013-14 and 77 crore ICLs and about 30 crore CFLs were sold. EESL, taking note of the previous measures taken by Bureau of Energy Efficiency (BEE) and critically analysing the barriers and challenges, designed a new business model called **PAY-AS-YOU-SAVE (PAYS)** that:

- (a) Provided LED bulbs to households at INR 10 each, which is the same cost as ICLs, thereby overcame the high-cost barrier
- (b) The balance amount was included in a consumer's electricity bill as Equated Monthly Instalment (EMI) over a 5-10 year period based on the cost of LED procured. INR 10 per month was added to the bills which is less than the monthly energy savings by use of LEDs as compared to CFLs/ ICLs
- (c) During the period of EMI, all failures of LEDs were warrantied and defective LEDs were replaced
- (d) An information and outreach programme was launched to spread awareness amongst consumers and other stakeholders. The first project was implemented in 2014 in the UT of Puducherry covering 2 lakh households by selling 6 lakh LEDs. The procured price of LEDs was INR 310 each and consumers paid it in monthly installment of Rs. 10 for 8 years

From pilot project in Puducherry to the World's largest LED programme

1. The success of the first programme in Puducherry brought to the core the fact that Distribution Companies (DISCOMs) were able to reduce their peak demand without having to invest any capital. The PAYS model provided an innovative solution to consumers as well as attracted other DISCOMs and states to join the programme.
2. Andhra Pradesh became the next state to implement the scheme in 4 districts initially with an overall coverage of 60 lakh LEDs. The procurement of 60 lakh LEDs reduced the cost to INR 204 and the PAYS model was implemented with EMI spread over 5 years. The success of the programme and the simplicity of the PAYS model attracted other states like Delhi & Rajasthan while Andhra Pradesh decided to implement it in all 11 districts.
3. This led to Ministry of Power requesting the Hon'ble Prime Minister to launch the National LED programme on 5th of January, 2015.
4. The encouragement by the Hon'ble Prime Minister took UJALA to the second stage where EESL, with the support of Ministry of Power, initiated efforts to:





Rajasthan



Delhi



Dimapur

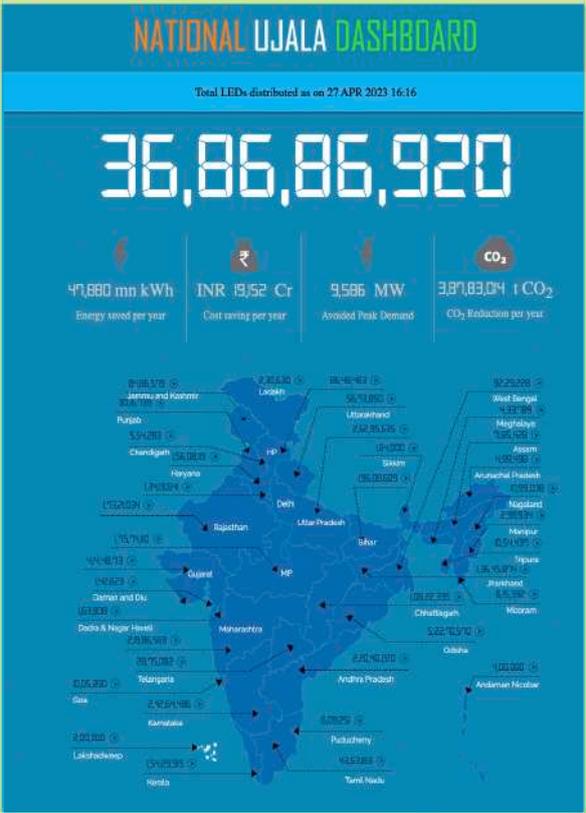
(a) Engage with more states and DISCOMs to join as there was no financial implications on them. The policymakers in states were informed about the benefits of the programme for consumers as well as management of peak load.



PM launches scheme for LED bulb distribution under Domestic Efficient Lighting Programme in Delhi

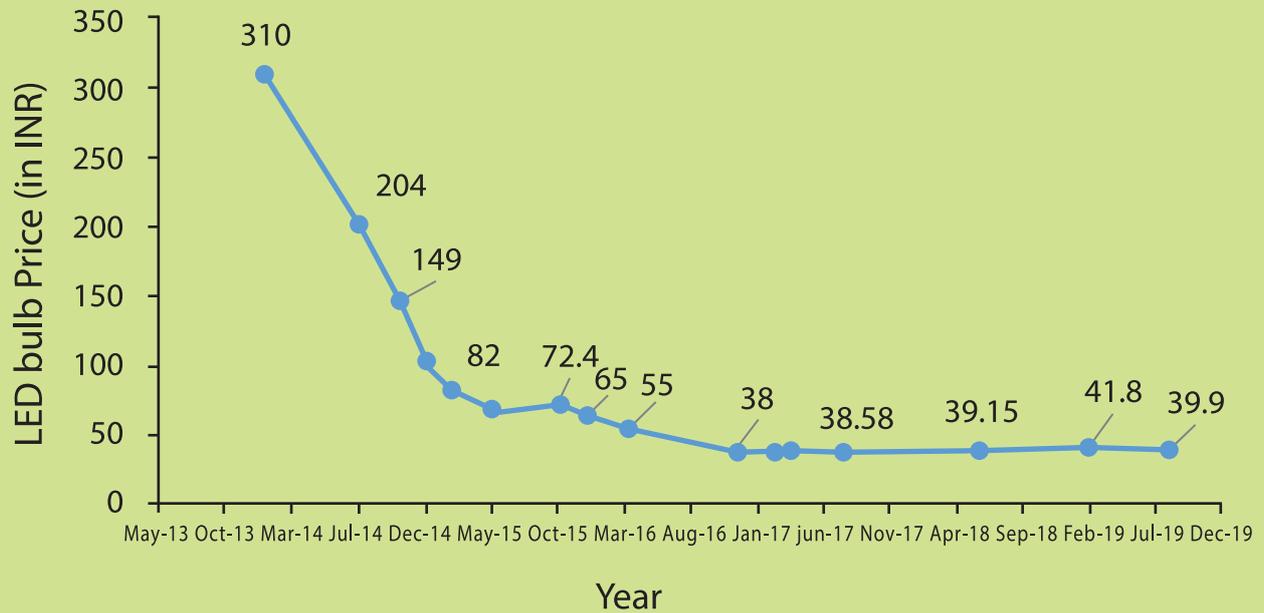
- (b) EESL started to aggregate demand and issue bulk procurement. It also ramped up distribution in all states.
- (c) The selling counters were set up where the consumer footfalls were high, like the billing centres of DISCOMs, other areas that were close to consumers doorstep.
- (d) Local level awareness programmes were launched informing consumers of the benefits of LEDs and locations in their neighbourhood where the bulbs were being sold.
- (e) A public UJALA dashboard was created that captured the sale of every bulb at each counter and provided exact location of the counter using Google maps.
- (f) The dashboard used a colour code where states that have joined the programme were coloured blue, while the others being white. This also increased the pressure on the policymakers to join the programme.

Screenshots from the live UJALA dashboard (www.ujala.gov.in)



5. The combination of aggregation, bulk procurement and scaling up of sale of UJALA bulbs resulted in dramatic drop in prices of LEDs as indicated below.

Procurement Price Per LED Bulb (in INR)



The procured price reduced by almost 90% between 2014 and 2017; from Rs. 310 to Rs. 38. This took UJALA to the third stage where LEDs were priced at Rs. 70 each and consumers, knowing the benefits of energy and cost savings and with the prices becoming lower than CFLs, started to buy LEDs paying upfront instead of EMIs. The sale of bulbs increased and EESL ramped up the selling counters in the country, thereby achieving sale of 6 lakh bulbs per day as compared to 6 lakh sale in Puducherry in 4 months a couple of years ago.



Telangana | Self-Help Groups (SHGs) were formed for awareness and distribution of LED bulbs



A win-win for all - social, economic and environmental benefits



Andhra Pradesh | More hope and a brighter future as study hours increased with new LED lights

Mercy Susan, 15, is a multifaceted girl. She enjoys playing the piano as much as she practises Yoga and karate. Not that she is lacking in academic curiosity either. Now in her Tenth grade, she enjoys mathematics and science subjects. "I like maths since I enjoy solving problems," says Mercy with a gentle smile. The answer resonates at a deeper level - Mercy is an orphan. She came to Chaitanya Mahila Mandali, an orphanage in Secunderabad, Andhra Pradesh, around four years back.

"With the other bulb I used to study for 2-3 hours. With the new ones, I put in 3-4 hours." The brighter light has a larger impact. "It gives me hope. I can do what I want to," says Mercy gleefully.



Sonepat, Haryana | Well-lit dhabas now attract more consumers

"We used to pay Rs. 45,000 on electricity bills," said Devdutt Sharma, co-owner of A1 Dhaba located on the stretch of the highway that passes through Sonepat in Haryana. He referred to the expense in the past tense because the dhaba's electricity bill has come down to Rs 15,000 in six months since replacing the multitude of tubelights and incandescent bulbs with LED lighting. As co-owner of A1 Dhaba Vijay Rana pointed out, "If the dhaba is poorly-lit or dark, people will not risk stopping to eat there." Rana and his partner Sharma are not only happy about the slashed power bill but have also overcome the problem of installing a generator. Their 25kVA generator wasn't able to take the load of illuminating the chains of lights and they ended up regularly paying penalties to the government for overloading their power lines. After switching to LEDs, the total load has come down to a mere 5kWh that the generator easily handles.

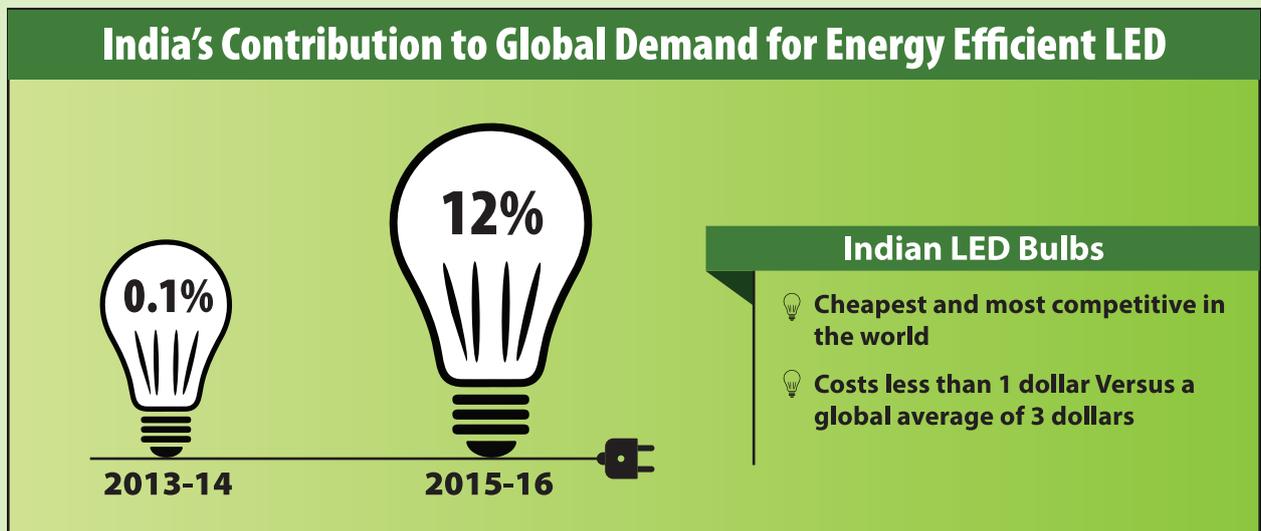


Ajmer, Rajasthan | LED bulbs available at e-Mitra centres are both, affordable & accessible

Amit Kumar, Resident of Sarwar, Ajmer, says that EESL LED bulbs are very good. They consume less electricity and come with a 3-year warranty. These bulbs can also be replaced easily in case of any problem. Since the e-Mitra centers are government owned, the replacement process is easy.

EESL has partnered with the e-Mitra network to deliver its wide range of energy efficient products in Rajasthan, which is the largest state in the country in terms of area.

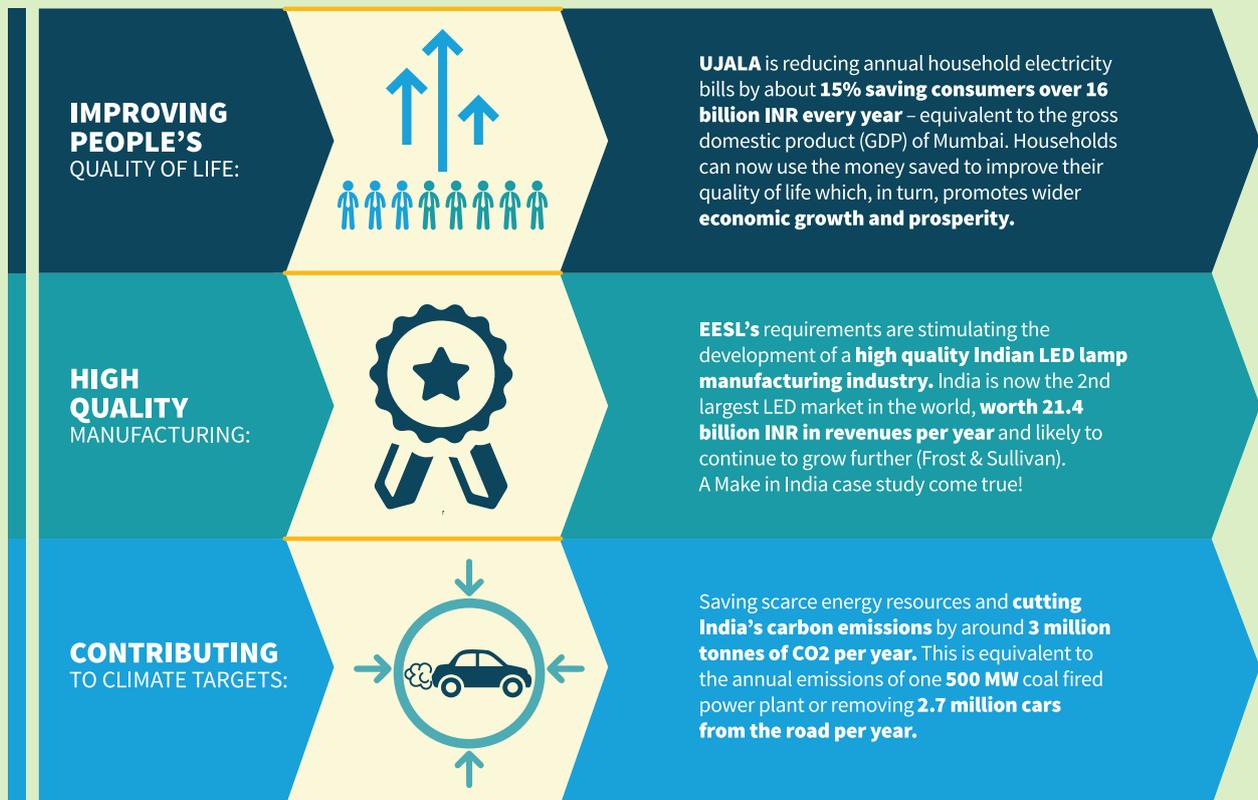
The LED revolution was raging in the country and it helped significantly increase demand for LEDs. India became the largest driver of global LED demand.



Currently LED industry sales "70 crore bulb every year. As on date EESL has sold 36.86 crore LED bulbs across India". This has led to enormous energy savings to the country as well as emission reductions. This LED revolution has not just resulted in savings of energy, peak demand and GHG emissions, but has, simply put, reduced the cost of LEDs to one-tenth in a short period of time and has made high technology LED lighting affordable to the poor.

D | Global Recognition

The UJALA programme has also caught global attention and the International Energy Agency (IEA) published a case study on the same (INDIA'S UJALA STORY). The key highlights of the IEA case study are:



The UJALA programme has also attracted the attention of Management schools and the entire programme is now a Leadership case study in Indian Institute of Management (IIM), Ahmedabad and is under consideration of being included in Harvard Business School. The IIMA case study can be purchased under the title - EESL: Shaping the Industry.

The key highlights from IIMA case study are:

1. UJALA and Street Lighting National Programme – SLNP are now an IIM-Ahmedabad case study. The case study gives the future leaders a chance to wear the hat of the Ministry of Power and EESL and encourages them to chart out the future course of action for the company.
2. It gives a detailed overview of EESL as well as the history of demand side management initiatives in India leading to implementation of UJALA and SLNP.
3. The classroom case study takes the reader through all the important milestones along with anecdotes (eg: Hon'ble Minister's vision to the MD about UJALA; the devastation caused by Hudhud cyclone and how an unknown company turned around the entire street lighting in a span of 6 weeks, etc.) that led to the establishment of current day's EESL and it is laid out in a way that the person reading it is living the journey of the programme along with EESL.
4. The case study talks in detail about the business model of EESL that led to the success of UJALA and SLNP. It also captures efficiently the role of Marketing, Procurement, distribution, HR, Manufacturing, and networking that made it possible for these programmes to be the top demand side management initiatives.
5. The case study very efficiently brings out how a start-up with a right vision and team can soar to great heights in few years. How each team function is critical to the success and how a mass programme in India can work without any government subsidy.



Smart and efficient public lighting - Street Lighting National Programme

The business model was used to scale up street light replacement in the country. As on date, 1.29 crore streetlights have been replaced. The value proposition is

- Pay As You Save (PAYS) business model
- No upfront investment- Re-payment from savings – performance guaranteed and failures warrantied
- Barriers of high first cost and comparative end use overcome
- Incentives for all stakeholders –aggregation of demand to leverage economies of scale
- EESL has completed street light installation work in 1326 Urban Local Bodies
- Entire upfront investment by EESL and repayment through deemed savings model
- 7-year contract with municipalities guaranteeing minimum energy saving (of-typically 50%) and free maintenance of lights.



New Delhi | Hon'ble Prime Minister replaces conventional Street light with Smart LED light



Before



After

Uttar Pradesh | Street Lighting National Programme has led to illumination of roads and reduced dark spots, enhancing public safety

F | Transforming Indian Power Sector with UJALA



“ The distribution of 28 crore LED Bulbs by the government not only saved more than \$2 billion in the last three years but it also saved 4 giga watts of electricity. ”

- Prime Minister Narendra Modi, 11 March, 2018



G | BLDC Fan's

For years, ceiling fans used to come with the same hardware of induction motor which typically consumed 70-80 watts for a standard ceiling fan. But in the last few years, a new technology called BLDC is being used to make fans consume a lesser amount of energy, without compromising on the air delivery. BLDC stands for brush-less direct-current motor, a special type of motor which has permanent magnet instead of electromagnets found in a conventional induction motor. BLDC motor has important advantages over induction motor like low electricity consumption, lesser noise generation and better lifespan.

Energy Efficiency Services Limited (EESL) is a JV of PSUs of Ministry of Power, Government of India has launched BEE 5 star rated BLDC fan. The Advantages of EESL's BLDC ceiling fans as compared to conventional ceiling fans are:

- BEE 5 star rated fans as per the new star rating of BEE
- Energy consumption of only 28 watt ~ 35 watt as compared to 70 watt ~ 75 watt power consumed by conventional ceiling fans
- Speed control by handheld remote-control unit
- Estimated reduction in annual consumption expected to be 1080 units leading to savings of INR 6000 for the household.



H | Gram UJALA

Building on the UJALA Scheme, CESL (100% owned subsidiary of EESL) has rolled out Gram Ujala program to provide LED bulbs at INR 10 per bulb and create an ecosystem of energy efficient appliances for rural homes. It is targeting to reach 15 million people and save 1.8 million tCO₂e per year. The scheme was launched by MoSP (IC) on 19.03.2021 In Bihar. Gram UJALA program has been implemented in the states of Bihar, Uttar Pradesh, Andhra Pradesh, Telangana and Karnataka.

This is a carbon finance based program offered to households in rural India, at Rs. 10 each for 12W and 7W. Bulbs are of the highest quality, energy efficient LEDs bulbs that consumes 88% percent less electricity as compared to the incandescent bulbs they replace. Savings occur at households from the reduced electricity bills.

As a pilot project CESL has distributed 1Cr LED bulbs in rural areas of 5 states (Bihar, Uttar Pradesh, Andhra Pradesh, Karnataka, Telangana).

CESL has achieved the target of distribution of 1 million LED bulbs in a single day on the National Energy Conservation Day (NECA), 14th December 2021. The event was launched by Hon'ble Union Minister of Power & NRE.



'India's LED programme, inspiration for many countries'

progressive, which is the replacement of incandescent with the energy-efficient LED bulbs. In fact, the Energy Efficiency Services Ltd (EESL) has been leading the way in this regard...

think about the competition, especially from the west. Many countries, such as the UK and Germany, have done that and we need to learn their experience with economies like India and China.

talk of energy efficiency and technology, we need to think about the energy transition. We need to think about the energy transition. We need to think about the energy transition.



As LEDs burn bright, it'll soon be lights out for

A 9-watt LED bulb that sold at ₹300 in 2014 is now priced ₹65 and getting cheaper

Already, nearly 50 per cent of the lighting market in India has been taken over by LEDs. And the government's decision to switch to LED for all street lamps and public space lighting will only hasten the end of CFLs in India.

latest round, the lowest price quoted was ₹38 for a nine-watt bulb. While nine-watts may seem low, this LED lamp will emit light equivalent to an 80-watt CFL or 60-watt conventional incandescent bulb. In fact, LEDs bring over 50 per cent of the revenues in the lighting segment for, says Biju.

Expanding LED portfolios But Biju is not the only one benefiting from the growing appeal for LEDs. From Philips and Havells to Compton and even new players, corporates are now investing money on expanding their LED portfolios. In fact, the OMS&S scheme, under which fans have been introduced in the country since 2012, reported revenues of ₹45 crore in FY16, up from ₹20 crore in FY15.

EESL engages women self-help groups for distribution of energy-efficient lights, fans

India is an emerging market for the distribution of LED bulbs and fans. The government has decided to open up the market for private players. EESL is leading the way in this regard...



Nepal to save ₹2,300 cr from deal with EESL

2-crore LED bulbs will be supplied to Nepal. The deal is worth ₹2,300 crore. EESL is leading the way in this regard...

EESL's LED success story: UK done, up next Malaysia

EESL has successfully completed the supply of LED bulbs to the UK. The deal is worth ₹1,000 crore. EESL is leading the way in this regard...

Petrol pumps to sell EESL's energy efficient bulbs, fans

As part of the agreement, EESL will make the entire front investment for ensuring availability of products at the outlets and no upfront capital cost will be borne by the OMS&S. The statement also said that over 2.5 crore LED bulbs and around 1.5 lakh energy efficient fans have been introduced in the country since 2012, reported revenues of ₹45 crore in FY16, up from ₹20 crore in FY15.

TN makes LEDs affordable for greener, cheaper power

rolled out at petroleum retail outlets in a phased manner. The first phase, distribution will commence from Maharashtra, Tamil Nadu and Karnataka. Consumers can purchase an LED Bulb at ₹70, a 25-watt LED tubelight at ₹1,500 and a 5-star ceiling fan at ₹10,000.

Save power with subsidised LEDs

9-watt bulbs offered at low rates to cut down 80% consumption; official. The government has decided to subsidise the cost of LED bulbs to encourage their use. This will help in saving energy and reducing carbon emissions.

Now, buy LED bulbs, fans from post offices

almost half of the prevailing market prices. The government has decided to open up the market for private players. EESL is leading the way in this regard...

Airports to be equipped with LED lights

In its bid to replace existing lights with energy-efficient LED fixtures, the government has decided to open up the market for private players. EESL is leading the way in this regard...

Affordable Lighting

UJALA serves as a game changer. The government has decided to subsidise the cost of LED bulbs to encourage their use. This will help in saving energy and reducing carbon emissions.

EESL has distributed nearly 351 million LED bulbs till date, generating annual energy savings of 4.55 billion MWh

Founded in 2009 by the government of India, Energy Efficiency Services Limited (EESL) is responsible for market related activities of the National Mission for Enhanced Energy Efficiency (NMEEE). EESL has distributed nearly 351 million LED bulbs till date, generating annual energy savings of 4.55 billion MWh.

UJALA: LEDing To The Realm Of Energy Efficiency

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सत्यमेव जयते

GOVERNMENT OF INDIA
MINISTRY OF POWER