



S.B.Datta

Principal Consultant - Lighting

Energy Efficiency Services Limited

(A JV company of PSUs of Ministry of Power, Govt of India)

ENERGY EFFICIENCY SERVICES LIMITED

Creating an Energy Efficient India



- 100% public owned company
- Promoted by Ministry of Power, Government of India
- Governed by all rules and procedures of Government of India
- Audited by C&AG and oversight by CVC
- Board of Directors represented by Ministry of Power and Bureau of Energy Efficiency (BEE)
- Authorised share capital – Rs. 500 crore

LED based Home and Street Lighting Programme



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

- Programme has 2 components

- (a) Conversion of conventional domestic lights with LEDs, and
- (b) Conversion of conventional street lights with LEDs,

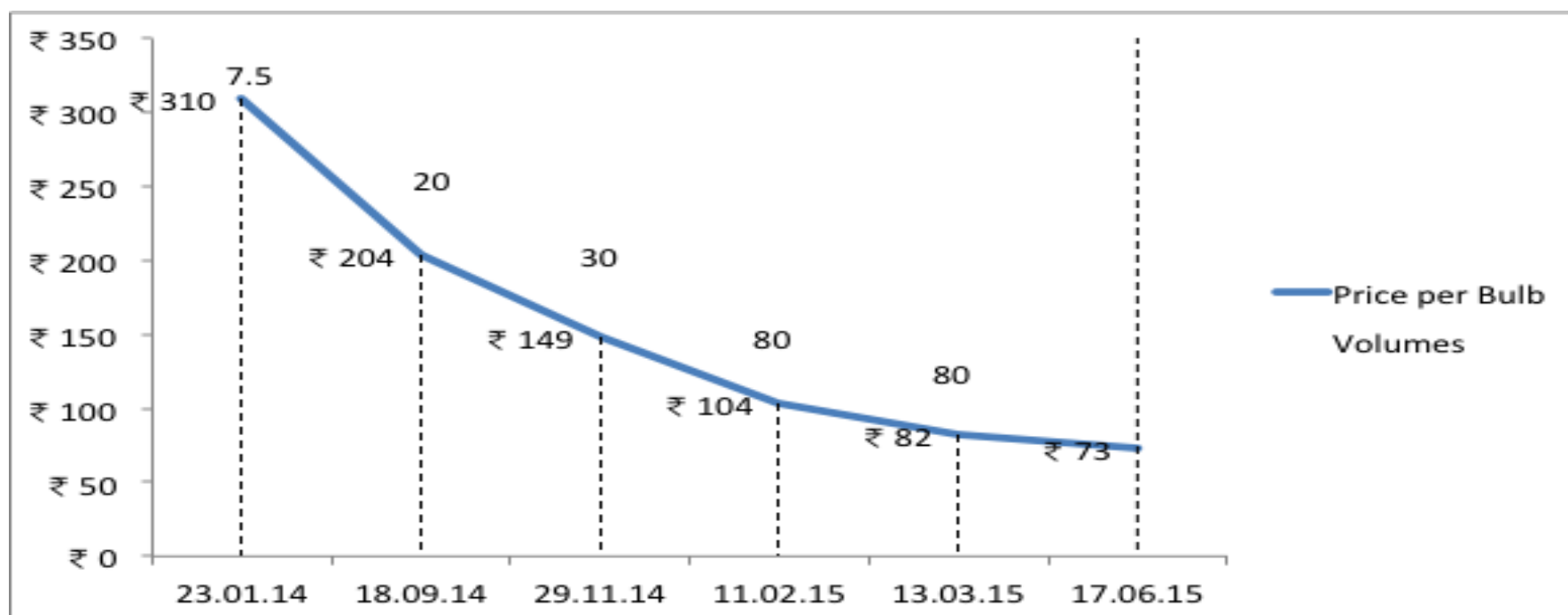
- 100 cities to be covered by March, 2016 and balance by March, 2019 targeting 77 crore ordinary bulbs and 3.5 crore conventional street lights

- **Domestic Efficient Lighting Programme (DELP)**
 - Replacement of 77 crore ordinary bulbs will result in savings of **100 billion units** annually and **Rs. 40,000 crores** in consumer bills
 - Average reduction of electricity bill of consumers by **Rs. 160-400** per year per LED
- **Street Light National Programme (SLNP)**
 - Replacement of 3.5 crore conventional street light will result in savings of **9,000 million units annually**
 - Total **cost savings** of municipalities every year will be **Rs. 5,500 crore**

- **Major barriers –**
 - (i) High price of LED;
 - (ii) Insufficient availability;
 - (iii) Lack of sufficient awareness.
- **Service model** devised wherein there is no need for upfront capital investment by ULBs. Domestic consumers to get LED s in easy installments with initial payment of Rs. 10
- The **cost recovery** will be done in installments over 7 year period for ULBs and 8-12 months for domestic consumers

Reduction in Price

Large scale and transparent procurement has led to sharp decline in LED bulb prices (with taxes)



- Retail price of LED bulbs reduced by almost 50% (Rs. 599 to Rs. 317)
- For street lights – prices have come down from Rs. 137 per watt to Rs. 85 per watt

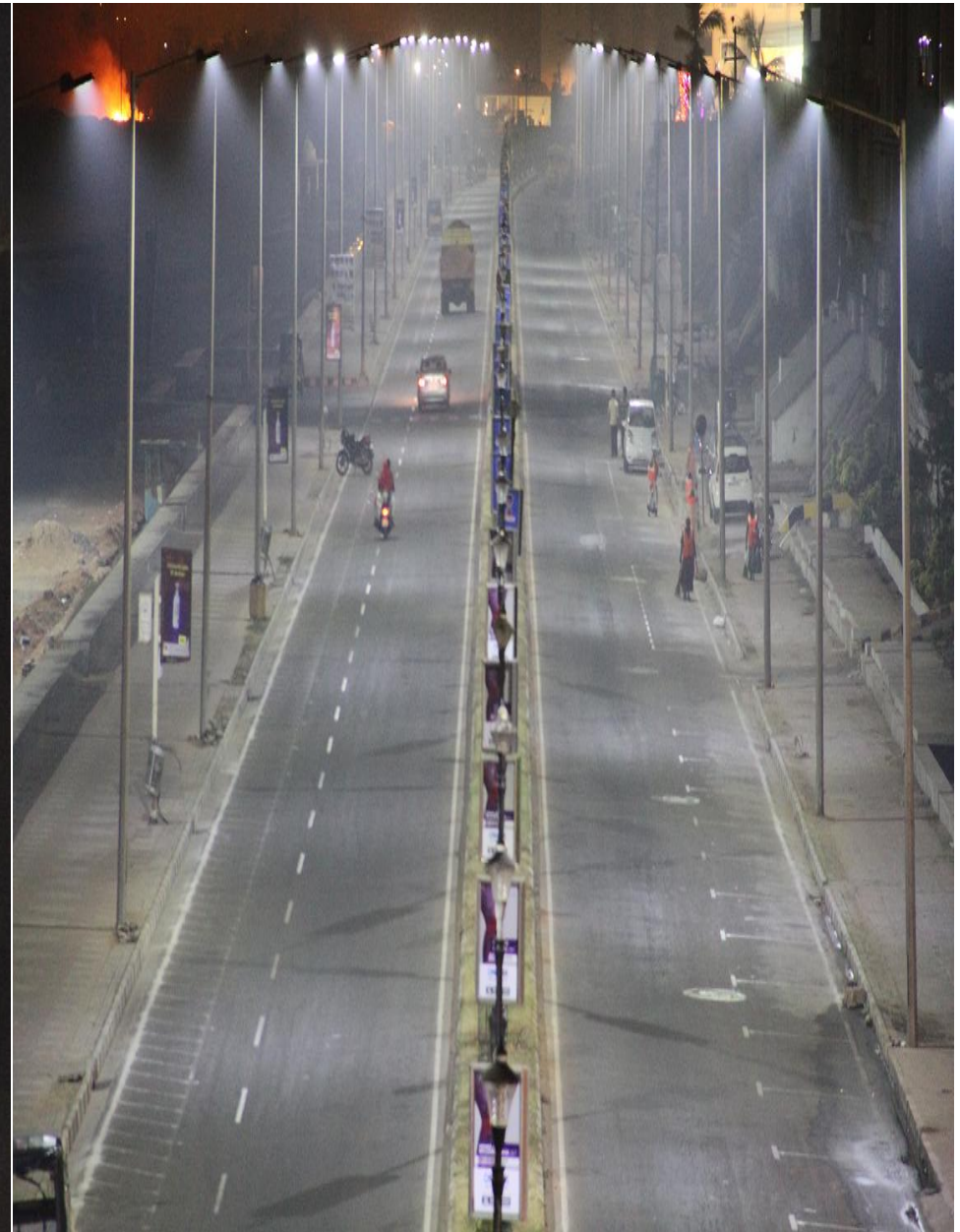
Coverage of Programmes - DELP



- 182 cities have enrolled in the programme
- Work in 7 cities completed - 6 cities of AP (Guntur, Anantpur, Srikakulam, West Godavari) and Puduchery - 87 Lakh LEDs distributed
- Distribution in progress in Delhi, Jaipur, Ajmer, Jodhpur, Thane, Mulund, Bhandup, Ratnagiri, Kanpur and Varanasi
- Agreements with 63 cities signed (AP, Rajasthan, UP and Delhi);
- Agreements with 68 more cities (Maharashtra, UP, AP and H.P) in final stages
- 15 crore LEDs to be distributed by March 2016

- 295 ULBs have enrolled in the programme
- Work in 6 ULBs (Vizag, Jhalawar, Mt. Abu, Pushkar, Neelimarna, Agartala) completed – 1,95,000 street lights replaced
- Installation in progress in 88 ULBs in Delhi, Rajasthan and AP to replace 9.3 lakh lights
- Agreements with 90 municipalities under finalisation
- 15 lakh LEDs to be installed by March 2016

Vizag Street Light Project



Actual Energy Savings



Vizag Street light project – actual electricity bill reduced by 50% for January-March 2015 as compared to same period in 2014

| S.No. | Before LED Installation | | | After LED Installation | | | % Cost Savings |
|-------|-------------------------|----------------|-----------------|------------------------|----------------|-----------------|----------------|
| | Month | Units in Lakhs | Amount in Lakhs | Month | Units in Lakhs | Amount in Lakhs | |
| 1 | Jan-14 | 23.80 | 194.63 | Jan-15 | 12.70 | 93.07 | 52.18 |
| 2 | Feb-14 | 23.89 | 186.14 | Feb-15 | 12.72 | 84.93 | 49 |
| 3 | Mar-14 | 17.08 | 174.09 | Mar-15 | 11.85 | 90.19 | 48.19 |
| | Total | 64.78 | 554.86 | | 37.27 | 278.18 | 50% |

Puducherry DELP – Independent assessment of energy savings by BEE – **estimated savings 40.57 m KWh actual savings in 2014-15 was 40.11 m KWh.** Similar assessment being undertaken in AP

- **Higher involvement of states**
- **Priority given to places of tourist, religious interest and heritage sites**
- **Involvement of Private Sector**
 - Projects financially viable – need for risk mitigation for revenue recovery from DISCOMs/ ULBs
 - EESL to share risks through Partnership and JVs
- **Enhancing capacity and capabilities of state level utilities to take up projects on their own – one DISCOM in UP initiated DELP – EESL is Transaction Adviser to KSEB for DELP.**

- Weekly monitoring of targets by Union Cabinet
- Review by MOSP(IC)
- Weekly review by Secretary (Power)
- Real time National DELP Dashboard launched by MOSP(IC) –
<http://delp.cruxbytes.com/forms/national-delp-dashboard.aspx>

➤ Quality control

- Procurement stage – testing as per BIS standards in independent labs
- Pre- Installation/ Distribution stage – random samples tested in NABL labs
- Post distribution/ installation – random samples tested in NABL labs
- 3 year warranty for domestic LEDs and 7 year warranty for street lights

➤ 30-50% value of contract retained as Bank Guarantee to ensure quality

➤ Outcome

- DELP – failure rate 0.012% (about 700 bulbs out of 85 lakh)
- Street Lights – less than 2%

➤ Domestic industry capacity increasing

- Domestic industry can manufacture 3.2 crore LED bulbs every month
- Capacity of street light manufacturing about 2 lakh per month for major players
- Number of lighting manufacturers empanelled with EESL have increased from 27 (in March, 2015) to 48 in May, 2015
- Increase in domestic demand will encourage LED chip manufacturers to set up facilities in India.

Agriculture DSM



- Low or no tariff reduces incentives for farmers – incentive for state to reduce subsidies
- BEE 5 STAR rated pumps given free of cost with maintenance support for 5 years
- Energy savings (25-37%) used to pay back investments
- Successful case studies below.

| S. No. | Parameters | Solapur, Maharashtra | Byadgi and Nippani Circles, Karnataka | Malavalli Subdivision, Karnataka | Rajanagaram Mandal, Andhra Pradesh |
|--------|--|-------------------------|---|--|--|
| 1. | DISCOM Name | Maha Discom | HESCOM | CESC | APEPDCL |
| 2 | Total nos of pumps replaced/to be replaced | 2209 | 590 | 1337 | 2496 |
| 3 | Avg. rating of pumps | | 5 HP | 5 HP | 18 HP |
| 4 | Total energy savings achieved in kWh per annum | 61 lac units | 30 lac units | 56.7 lac units | 213 lac units |
| 5 | Energy savings achieved % | 25 % | 37 % | 37 % | 28 % |
| 6 | Minimum Operating hours per day | | 6 | 6 | 6 |
| 7 | Nos. of days considered per annum | | 365 | 300 | 300 |
| 8 | Tariff considered for energy savings (Rs. / kWh) | | 5.08 | 4.40 | 3.95 |
| 9 | Project Duration | 5 | 6 | 6 | 5 |
| 10 | Project Status | Completed in 2010 | Completed in Dec 2013 | Completed in March 2015 | Ongoing |

- Finalisation of projects in Karnataka and AP where pilots have been successfully completed
- Project area in AP identified with 36,000 pumps with segregated feeders
- Commercial deployment of solar agriculture pumps being examined

Buildings



- 20-25% reduction in energy use possible with retrofits of lighting, fans, ACs
- Investments made upfront can be recovered in 3-4 years from energy savings
- Successful implementation of few projects by EESL is below
- Online monitoring of energy consumption by Energy Management System

| Place | Name of Building | Brief Scope | Project Investment, Rs. | Actual Cost Saving | Actual Energy Savings (KWh) | Expected Start/End Month | Remarks |
|-------------|--|--|-------------------------|--------------------|-----------------------------|--------------------------|--|
| DELHI | Niti Aayog Phase I | EE retrofits for fans, lights, pumps and portable AC | Rs. 85 Lacs | Rs. 37.8 lakh | 4.2 lakh KWh | Completed May 2014 | One year energy savings - BEE has accorded 5-STAR status to Niti Aayog |
| | MOP, MLE and MWR, Shram Shakti Bhawan | EE retrofits for fans, lights and ACs | Rs. 130 Lacs | Rs. 14.85 lakh | 1.65 lakh KWh | Completed March 2015 | Energy savings of 3 months |
| | India Habitat Centre | EE retrofits for lighting works in IHC admin area | Rs. 50 Lacs | Rs.10.29 lakh | 1.14 lakh KWh | Completed December 2014 | Energy savings for 6 months |
| WEST BENGAL | Bengal Chambers of Commerce and Industry Kolkata | EE retrofits for fans and lights | Rs. 14 Lacs | Rs. 3.05 lakh | 44,769 KWh | Completed August 2014 | Energy savings of 11 months |

- MoU being signed between EESL and CPWD for implementation in 1000 government buildings in the country
- MoU being signed between Ministry of Railways and EESL to implement efficiency measures in buildings, stations, etc
- Discussions with large PSUs like ONGC, NLC and Banks (Dena Bank) for implementation of similar projects

- Demand Side Management (DSM) Action Plan being developed for 32 DISCOMs – Load Research under progress
- Advisory support to Regulatory Commissions for development of Monitoring and Verification guidelines (GERC)
- Advisory support to State Designated Agencies for development of Energy Savings Plan
- Support to SMEs under a GEF programme

- Equity base increased from Rs. 90 crore to Rs. 500 crore – to be enhanced to Rs. 1000 crore
 - Staff strength increased from 100 to 300 – norms for manpower approved
 - Concessional loans from bilateral and multilateral agencies
 - Rs. 700 crore line of credit available from KfW and AfD.
- Discussions for additional Rs. 3,000 crore ongoing with ADB, KfW and JICA

Thank You

For more information contact

sdatta@eesl.co.in

www.eesl.co.in