



Go Green with Solar LED Lighting

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Presentation Agenda



- Introduction : VLE & BLAZE
- LED Lighting and areas of application
- Advantages of LEDs for Street Lighting
- Replacement of HPSV to LED's
- Technical Specifications of various LED Luminaries configurations.
- Energy Saving and ROI calculations
- Solar LED Street Lighting systems
- Conclusions

Visionary Lighting & Energy India (VLE)



VLE - Social Enterprise Child of LUTW

- **Mission:** To bring the latest, most revolutionary and appropriate Renewable Energy and LED Lighting technologies to the Developing World.
- **Vision:** To use Renewable Energy and LED Lighting to significantly improve the quality of lives of all in the Developing World, by helping families escape the poverty trap by providing safe, healthy and affordable lighting to the maximum number of homes, in the least time, and at the lowest cost.

VLE & BLAZE Automation



- VLE & BLAZE Automation have Collaborated Technically since 2009
- BLAZE is responsible for the design of VLE product line
- Inclusion of Advanced Technologies into Solar Lighting : Sensors , Wireless controls, Security, Surveillance for Safety and Energy Saving
- Blaze Specializes in Security, Automation, CCTV Surveillance (RBI, Eamcet and Engg), Green Homes (India's First Platinum Green Home), Audio and Video Distribution, Apple Applications, RFID, GPS Tracking and vehicle immobilizers etc.

Where is all this happening?



Light Up The World Foundation
www.lutw.org

LUTW is instrumental in Illuminating over One Million Lives in 54 countries

Solar LED Street Lighting System



Range Available from 12 Watt to 150 Watt

Can be customized to Existing Poles

A Combination of Solar and Wind is latest trend

Price Range : Rs. 3,500 to 90,000

Commercial LED Lighting Components

Retrofit LED Lamps (3 – 10 W)



Ceiling Mount spot Lamps



LED Down Lighter for CFL replacement



T5 Tube replacement with LED

Available in : 30, 60, 120, 150 cms with various LED power o/p options

LED Lighting and areas of application

- LED Lighting – Endless possibilities to create better experiences through Light.
- LED lighting uses less energy than most other lamps, lasts longer and requires less frequent replacement.

Application Areas:

- > Architectural Lighting
- > Pathway Lighting
- > Street Lighting
- > Home Lighting
- > Security Lighting
- and many more....

Advantages of LEDs in Lighting

- Reliability (no spontaneous failure)
- **Emits less heat**
- Use less power
- **Energy Efficient**
- Quick ON / OFF response
- Very Helpful for **CCTV Surveillance in Night time**
- Free of hazardous materials
- **Long lifetime** (approx. 40 times of normal bulb)
- Longer service intervals for street lights
- **No Light pollution**
- Easy to Dim
- Flexibility in colors

Replacement of HPSV to LED's

- Street Lights (250w HPSV) on main roads can be replaced by Energy Efficient LED Lights (60w)
- Street Lights (150w HPSV) on sub roads / streets can be replaced by Energy Efficient LED Lights (40w)
- Domestic Lights (60w) on streets can be replaced by Energy Efficient LED Lights (18w)

Technical Specifications – 60w LED Vs. 250W HPSV

S. #	Parameter	Specifications	
		60 W LED	250 W HSPV
1	Operating Voltage (Vac)	90 – 275Vac	170 – 260 Vac
2	Lamp Source	High Power White LED	Sodium Vapour
3	Power Consumption	60w	250 W
4	Color Temperature (k)	5000 – 6000K	Not spectrum based
5	Expected Lamp Life	50000 Hrs	10000 Hrs
6	Lux at 6mtr pole	22 Lux	13 Lux
7	Restart Time	1 Sec	120 seconds

Technical Specifications – 40w LED vs. 150W HPSV

S. #	Parameter	Specifications	
		40 W LED	150 HPSV/MVL
1	Operating Voltage (Vac)	90 – 275Vac	170 – 260 Vac
2	Lamp Source	High Power White LED	Sodium Vapour
3	Power Consumption	40W	150 W
4	Color Temperature (k)	5000 – 6000K	Not spectrum based
5	Expected Lamp Life	60000 Hrs	10000 Hrs
6	Lux at 5mtr pole	13.5 Lux	8 Lux
7	Restart Time	1 Sec	120 seconds

ROI Calculation (Part 1)

Parameters for energy statistics:

Enter Power Consumption, Original Power Factor, & No. of Fixtures

Orig. **250** W & PF **95** %

LED **60** W

Quantity **1**

Totals: **250.0** W

60.0 W

Hour-Day-Week Notes:

- For Occ. sensors or dimming, use average hours
- For photocell use nighttime hours
- Use decimal weeks if holidays affect lighting (1 day = 0.14 wk)

× Daily use **11** Hours

× Weekly use **7** Days

× Yearly use **52** Weeks

× Power Cost \$ **0.11** / kWhr

	Original	LED
Annual Energy Cost:	\$110	\$26

Savings: Annual = \$84 Monthly = \$7

LED Investment:

(LED maintenance is cleaning, inspection, etc. as should be done with all lighting.)

Full Cost for 1 Fixture Installed. (costs - discounts) = \$ **160**

LED Maintenance Interval: **2.0** Years @ \$ **10** per Visit. [Lifetime ÷ Interval × Cost × Quan. = \$62]

(\$160 × 1) + \$62 = \$222 + FIXED JOB COSTS \$ **5** = \$227 Investment

Subtract a rebate from FIXED JOB COSTS, or, enter negative (-)JOB COSTS if rebate only.

ROI Calculation (Part 2)

LED energy costs and reduced CO₂ production during LED lifetime:

LED Life **50000** Hours ÷ 4004.0 Hours/Year = **12.5 Years Lifetime**

Years × \$26 annual energy cost = \$330

Years × \$84 annual energy savings = \$1045 (over original)

\$257 invest. + \$330 energy = \$587 Project Cost

CO₂ reductions
 (based on Coal fuel)
0.6 Tons Less / year
7.5 Tons Less / lifetime

Original fixture with lifetime maintenance and energy costs:

Original fixture life **5000** Hours ÷ 4004.0 Hours/Year = **1.2 Years Lifetime** \$ **100** Full Cost for 1 Fixture Installed

Years × \$110 annual energy cost = \$1375 Relamp Cost \$ **50** (relamping, cleaning, etc. every **1.2** years)

\$621 Fixtures & Maint. + \$1375 energy = \$1997 Orig. Cost during LED Lifetime, repaired **9** times.

Payback time and ROI with Amortized Cost + Interest:

13 % Interest Rate

Payback

Investment ÷ (Energy + Maint. Savings) \$257 ÷ \$128 = **2.0 Years**

Simple ROI: (energy & maint. Payback – Investment) ÷ Investment = **525.3%**

Annual ROI: = 240.4%

Some Other Special Features

- Motion Sensor Integration
- Remote Control Facility
- Mid Night Dimming
- Energy consumption monitoring and cost calculations

Solar LED Street Lighting systems



Ideal for remote Locations, No Much cabling required, Very Low Maintenance

Conclusions

ROI for replacement of 250W HPSV Lamps with LED : 1.5 (For Exact Replacement with 40Watt LED Fixture) – 2.0 Years (For replacement with 60 watt LED)

Each 250 Watt HPSV replaced with 60 Watt LED will reduce at least 7.5 Tones of CO₂ emission throughout its life time.

Inclusion of Solar Panels and Battery will further increase the Savings and can reduce more CO₂ emissions. Where as ROI will be little longer (4 – 5 years typically). But for remote and unmanned operations ROI for Solar is around 1 year maximum.

Thank you

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