

SOLAR STREET LIGHTING SYSTEM

A solar lamp is a portable light fixture composed of a LED lamp, photovoltaic solar panel, and a rechargeable battery. Solar lamps recharge during the day. At dusk, they turn on (usually automatically, although some of them include a switch for on, off and automatic) and remain illuminated overnight, depending on how much sunlight they receive during the day. Discharging time is generally 8 to 10 hours. Solar lights are easily installed and maintained, and provide a cheaper alternative to wired lamps.



LED Street lighting is a fresh new alternative to traditional street lamps such as LPS, HPS, or MH street lights. LED lighting provides a multitude of advantages over conventional incandescent light: LED street lights are environmentally friendly, energy efficient, and cost-effective. This smart,

"green" option for outdoor lighting has emerged on the green scene due to the recent technological advancements of LED illumination.

But more "greener" option is Solar street lighting by recycled green energy lighting system. They are of energy saving and environmental friendly, which can be used for residential, road, park and so on. High quality solar panel absorbs sunlight and convert into electric energy, then charges maintenance-free battery and finally LED street lights automatically when day off, auto-off when day break.

The working method of solar street lights is: solar panel absorbs sunlight and converts it to electricity to drive 12W/36W LED Street light.

The whole system is mainly composed by:

12W/36WLED street lighting, solar panel, lead acid battery and solar street lighting controller, pole (suggest 6-8m height).

Advantages of LED Solar Street Lighting Projects

1. Lower power consumption
2. Higher power, higher intensity
3. Save all your electricity cost. Save electric transformer and cable cost. Free maintenance
4. Environmental Impact - Eliminate Hazardous Disposal
5. Longer lifetime: Lifespan of solar panel is 20-25 years. Lifespan of LED street lights is 6-8 years. Lifespan of battery is 4-6 years.

Additional Benefits

1. Improved Safety – The solar powered street light does not require connection to an electrical grid. It is safer and easier to install. In the event of a power outage,

the light remains on. This reduces the chance of car accidents and the constant light deters theft/vandalism from nearby businesses.

2. Lower Operating Cost – It is less expensive to operate a solar powered street light than a traditional street light.
3. Reduced Damage/Theft – By locating the solar technology directly on the light fixture and placing the battery within the light fixture, the risk of damage, theft or tampering is greatly reduced. There are no wires in the street pole, which means that the wire itself (which exists in regular street lights) can't be stolen and sold for scrap.
4. No Insect Swarming – The solar powered street light uses LED street lighting which does not produce Infrared light, and therefore will not attract insects. (No more moths and other flying insects swarming around the light.)
5. Fast Installation – Since you don't need to trench power lines to the pole, run wires up the pole, connect wires to an electrical grid, or hard wire the street light, the installation is significantly faster. In fact, it is so easy, it can be installed on the pole before its erected, and thereby reducing a step completely from the process

Solar street lighting system uses the photovoltaic technology to convert the sunlight into DC electricity through solar cells. The generated electricity can either be used directly during the day or may be stored in the batteries for use during night hours.

Parts of a solar street lighting system

The solar street lighting system comprises of

- Solar photovoltaic module
- Battery box
- Lamp with charge controller
- Lamp post

In general, the specifications of the parts are

- 74 Watt Solar PV Module
- 12 V, 75 Ah Tubular battery with battery box
- Charge Controller cum inverter (20-35 kHz)
- 11 Watt CFL Lamp with fixtures
- 4 metre mild steel lamp post above ground level with weather proof paint and mounting hardware.

Solar street lighting system is ideal for street lighting in remote villages. The system is provided with battery storage backup sufficient to operate the light for 10-11 hours daily. The system is provided with automatic ON/OFF time switch for dusk to dawn operation and overcharge / deep discharge prevention cut-off with LED indicators.

The SPV modules are reported to have a service life of 15-20 years. Tubular Batteries provided with the solar street lighting system require lower maintenance; have longer life and give better performance.

Approximate cost: The approximate cost for the most common specification is around Rs 25,000. It varies based on models.

SPECIFICATION FOR 12W LED STREET LIGHT

Solar PV Module	75Wp
General	
Application	Battery Charging, Solar Home Lighting System, Solar Street Light etc.
Use	Outdoor
Material type	Mono crystalline silicon / Polycrystalline silicon
Encapsulation	Toughened glass – E.V.A - TPT
Frame	Anodized Aluminum
Electrical	
Rated Power (P _{ld}) (at 1000W/m ² , 25°C, 1.5AM, 16.4V)	75 ± 0.5W
Battery	
Application	Storage device for Solar Street Light
Battery capacity	12V, 60Ah (VRLA Gel)
Battery ratings	@ C/10
Depth of discharge	Max 75%
LED Street Light luminary	-12W
General	
Application	Solar powered street lighting
Use	Outdoor
Storage Temperature	-10°C to 85°C
Operation	DUSK TO DAWN
Lamp Wattage	12W
Rated Light output (Lumens)	1200 ± 5%
Lamp colour temperature	6500°K
Light coverage	> 120 Deg
Rated Lamp life (Average)	50,000 Hrs
Electrical	
Nominal working voltage	12V DC
Converter efficiency	> 85%
Charge Controller	
Charge controller type	Series pulse two step
Charging current (max)	6A
Solar module size (max)	75Wp
Charge controller efficiency(min)	>97%
Idle current consumption	<3mA
Low battery warning voltage	11.60 ± 0.15V
Low battery load cut off voltage	11.40 ± 0.15V
Low battery reconnect voltage	12.60 ± 0.15V
Gassing voltage @ 25°C	14.40 ± 0.15V

Floating voltage@ 25°C	13.60 ± 0.15V
Gassing reconnect voltage @ 25°C	12.30 ± 0.15V
Module sense voltage @ lamp ON	2.5 ± 0.15V
Module sense voltage @ lamp OFF	4.0 ± 0.15V
Over voltage, Under & over temperature protection (LED's alternative protection)	Should be Provided
Under voltage (simultaneous blinking)	Should be Provided
Mechanical	
Pole	ACC-ERP-14,GI NB65,6M AL Painted
Luminary Mounting Structure	ACC -MBT-08,SLS,NB65/NB80,1MTR , 1Pcs
Module Mounting Structure	Pole mounting type, 1 Pcs
Battery Enclosure	GI ground mound