

SOLAR STREET LIGHT



Solar streetlights use a photovoltaic effect to convert sunlight into electricity during the day, which is stored in a battery via a charge controller. At dusk, the system automatically uses the stored energy to power an LED light, which illuminates the area until sunrise. The charge controller regulates the flow of electricity and protects the battery from overcharging or over-discharging.

How solar street light works?

Day time: Charging

- Solar panels, made of photovoltaic cells, capture sunlight and convert it into DC electricity.
- This electricity is sent to a charge controller, which regulates the voltage and manages the charging process.
- The charge controller directs the electricity to a rechargeable battery, where it is stored for later use.

Night time: Illuminating

- As it gets dark, a sensor detects the absence of light.
- The charge controller activates the LED light, which draws power from the battery.
- The LED light illuminates the area until the charge controller detects sunlight again at dawn, signalling the battery to start recharging.

What are the components and features?

- **Charge Controller:** This is a critical component that protects the battery by preventing overcharging and deep discharge, and can also include features like light and time control.
- **LED Light:** Light-emitting diodes are used because they are highly energy-efficient and have a long lifespan.
- **Motion Sensors:** Some modern solar lights include motion sensors that increase the brightness of the light when movement is detected, conserving energy while providing security.

Types of solar street lights?

- **All-in-one (AIO) units:** Have the solar panel, battery, and controller integrated into a single fixture. They are easy to install but may have limited capacity.
- **Split system** - Have separate components, allowing for larger panels and batteries, which can result in greater energy capture and longer runtimes, particularly in remote locations.