



BRIGHTENING YOUR HOME BRIGHTENING YOUR WORLD

MARGA DEEP Solar Streetlights

- Four models : MV 3, MV 6, MV 7, MV 8
- PL 11 and SOX Lamps
- High efficiency PV batteries
- Galvanised steel pole
- Up to 4 days system autonomy
- Auto on / off, dusk-to-dawn operation
- Ready to install, negligible maintenance

Applications :

- Roads, Highways, Bridges, Flyovers, Yards
- Townships and Housing Colonies
- Forest Areas, Watch Towers
- Hotels & Resorts
- Railway & Shipyards



JUGNU Solar Home Lighting Kits

- Packaged 12 V systems containing module, battery regulator, high efficiency electronics and luminaires
- Ready-to-use Kit : easy to install, easy to use, negligible maintenance
- Available in a wide range of MNES approved models

Applications :

- Banks • Clinics
- Construction Sites
- Farmhouses • Homes
- Offices • Stores



Solar Water Pumping Systems

- Surface and Submersible Types
- Up to 2 HP rating pumps
- Can lift water from depths up to 166 ft. (50 m) and deliver up to 1,35,000 litres / day
- 3 position Manual Tracking
- Easy to install, minimum maintenance and completely serviceable
- Over 200 systems installed all over India

Applications :

- Booster Service
- Camp Sites
- General Purpose Pumping
- Homes
- Liquid Transfer
- Small Farms
- Spraying Systems
- Water Circulation
- Water Supply for Irrigation



Solar Road Studs

- Improves driver awareness
- Increases visibility
- Reduces risk of accidents
- Dusk-to-dawn operation

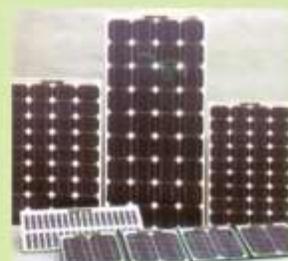
Applications :

- Busy Traffic Intersections
- Dangerous & Sharp Road Bends • Road Humps • Hilly Areas • Ghat sections • Center Line Dividers • Areas with Foggy Weather • Airport Guidance Lights • Flyovers • Multi-lane Highways



Solar Modules

- Silicon Monocrystalline and Multicrystalline Modules
- Various ratings available
- Comprehensive range : up to 170 W
- Manufactured to international standards
- Approved by : MNES, ISPR, UL, RDSO, DoT / DEC ONGC, CQAL, IECQ, DGS & D



ECOGENIE Solar Power Pack

- Designed to power Lights, Fans and TV
- Modular design : option of adding on Solar Modules
- PWM based solar charge controller
- Works on both Solar & AC mains Power
- Provides protection against Over Load, short Circuit, Battery Deep Discharge & Over Charge

Applications :

- Residences • Farmhouses
- Resort • Hospitals & Clinics
- Offices • Computer Centres
- Educational Institutions
- Shops & Showrooms • Cable TV Operations

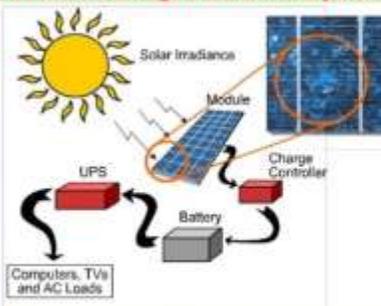


TATADEEP Solar Lanterns

- Ideal portable Lighting system
- Bright, omnidirectional light -anytime, anywhere
- Charging via Solar Module or AC Mains using optional Solarmite Charger
- 3 / 5 hours of continuous bright light on single charge for MK 3 model and 2 hours of light for MK 4 model
- Over 50,000 lanterns already supplied in India and abroad



The working of a SPV System

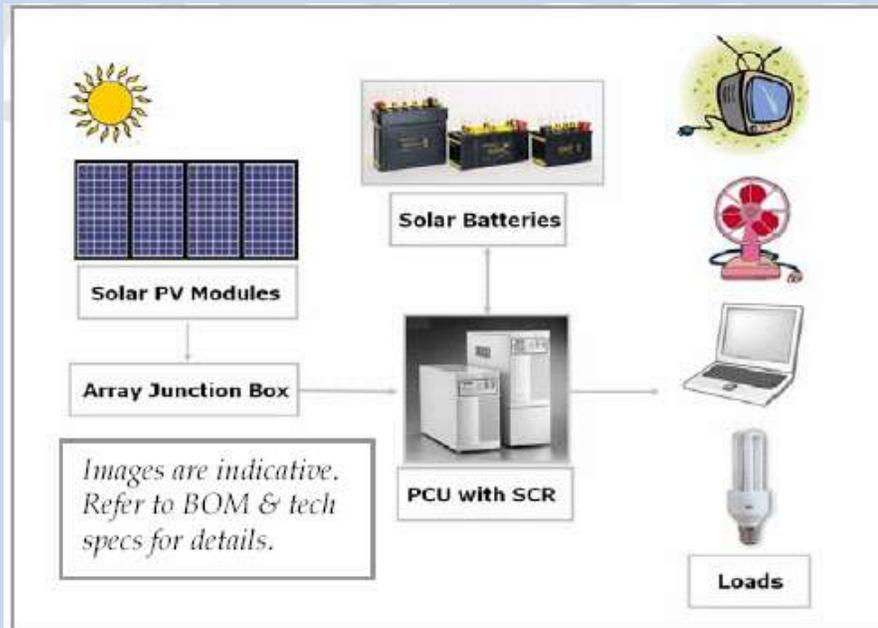


- During daylight, when the sun is shining bright, the Solar Modules 'collect' sunlight and convert it into electrical energy.
- This energy is then channelised through the Solar Charge Controller and stored in the Battery Bank, which is connected to UPS.
- When Grid Power is available, the UPS feeds the energy to the loads directly, powering Light, Fans, Computers/TVs and other similar loads.

- In the absence of Grid Power, (power Cuts or Voltage Fluctuations), the UPS operates in 'Inverts' Mode, using energy stored in the Battery to power the connected load
- Depending on load and usage pattern, the Batteries, designed to provide adequate back-up for extended hours of operation, are charged by Solar / Grid Power.

SYSTEM DESCRIPTION

SOLAR Photovoltaic SWHS (SPV)



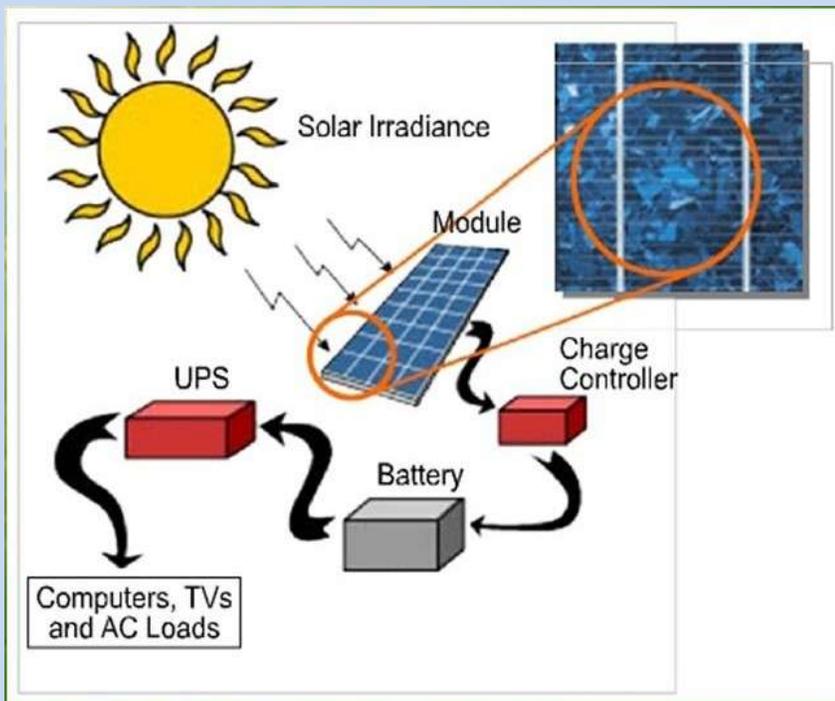
Solar Components and Working of System:

Solar photovoltaic (PV) systems are like any other electrical power generating systems. In PV system, just the equipment used is different than that used for conventional electromechanical generating systems. However, the principles of operation and interfacing with other electrical systems remain the same. Although a PV array produces power when exposed to sunlight, a number

of other components are required to properly conduct, control, convert, distribute, and store the energy produced by the array. Solar PV system consists of following major components.

- **Solar Photo Voltaic Modules:** The solar radiation falling on the modules is converted in to electricity by photovoltaic principle. Each set of solar array consists of number of solar modules connected in series and parallel connection depending on capacity and operating voltage. The generated array current is used to charge the battery bank.
- **Array junction box / Charge Controller:** AJB is used to connect the solar array strings in parallel at one common place.
- **Power conditioning unit / Inverter:** A common cubicle consisting of Inverter & solar charge controller. PCU is used to optimize the utilization of the battery capacity and to extend the service life of the battery by controlling the battery charge and discharge level. PCU also does the function of converting DC energy into AC energy to power AC loads like computer, printer & light's.
- **Battery bank:** Battery bank is used to store the electrical energy produced by the solar array during day time and uses the same when backup is required.

PS : The specification of all the systems would be different and would be provided with the firm proposal



- When the sun shines, the solar panels generate direct current (DC) which flows into an the current storing device called batteries via charge controllers so that any regulations in the solar energy can be taken care of before it enters into the battery bank. The battery bank is connected to the inverter to create an alternating current (AC) – AC is used by the appliances in your home. Note that the solar panels work best in sunlight; however they will still generate some energy when it is overcast using 'diffuse sunlight'.

be used in two forms- (a) You use the inverter when the national grid fail, or (b) The AC flows from the inverter into the fuse box. If you are using electricity – perhaps you are watching tv, or the washing machine is running – the electricity will flow straight into these appliances (topped up, if necessary by additional electricity from the national grid). If you do not need the electricity it can flow back into the national grid so that someone else can use it – in effect your house / project can become a mini power station (hence the term 'power generation generation').

- You can also get paid for any surplus energy that you generate. For this, you can receive a feed in tariff in respect of all the energy that you generate (using a 'grid-connected system such as the above), whether or not you use it. This is possible, only if you are into an Power Purchase Agreement (PPA) with the state authorities.

'On grid' versus 'Off-grid'

On Grid systems

Grid-connected photovoltaic systems are the most common type as they make use of the existing mains electricity grid. They are simpler in design and easier to fit than off grid systems. The electricity produced during the daytime generally used by the property owner. At night, or on dark days when the panels do not produce sufficient power, electricity will be supplied via normal national grid system.

Off Grid systems

Far less common is an "off grid" or 'stand alone' system, which produces and stores power independently from the utility grid. These systems are particularly suitable in remote locations especially those where the property is more than one-quarter mile from the nearest power lines. Often the installation of an off grid PV system proves more cost-effective than extending the power lines. The electricity generated by the panels is stored in a bank of rechargeable batteries as DC but in order to power household appliances an inverter will be required to convert the stored DC to AC. These rechargeable batteries contain specialised parts and chemicals not found in disposable batteries and are therefore larger and more expensive to purchase and maintain.