

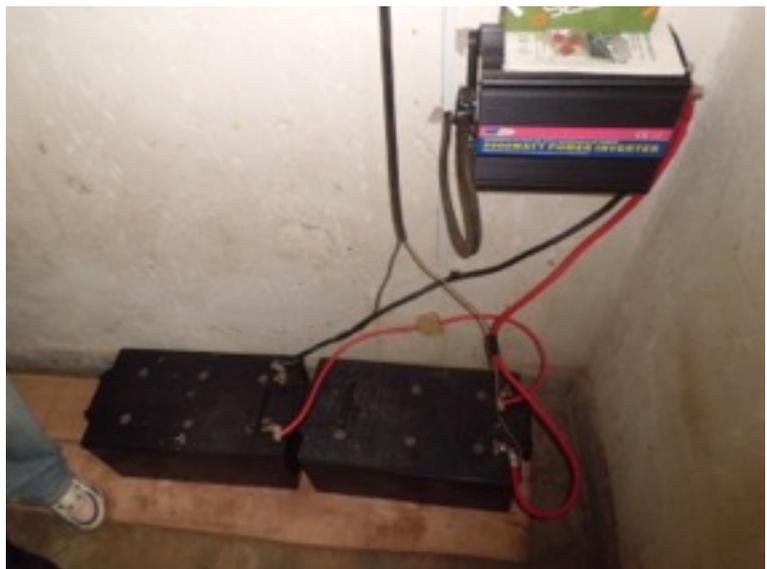


Sunnytek works in many areas where there is no power grid. Often schools and other buildings have no power in any way which limits what can be done here. Power is needed to improve education and strengthen the society. By this reason we have developed a standard package for schools and other area with rooms used for meetings. In short we offer.

We have delivered and installed some systems in Africa with good results. These are in area where grid is far away and will not come in years.

Sunny tek solutions are not very costly but also offers a low life cycle cost as we have high quality non China made components. Typically we can operate for 5-8 years with no maintenance or change of components.

- * **Solar panels** to generate power from sun. Here we can add wind mills if area is windy and hydro-power systems if there are water streams in the close area.
- * **Battery back up** system that store energy for the operations. They are charged daytime by sun and after sunset we can use what is stored in battery system for all activities. Here we use special made battery units designed for solar energy with a life time of typically 5 years or more.
- * **Charger and control electronics** that see battery systems are used correctly and charged without destroying cells. We often add a fan system to cool battery units to operate cooler.
- * **Inverter unit** that gives 110 or 230 VAC output so normal electrical equipment can be used. Often we have a 600W inverter with sine wave output that can handle electronics.
- * **Mobile phones** and Laptop PC can be charged booth for students and teachers
- * **Power for PC systems** and light projector for education purposes and over head projectors.
- * **4 LED lamps** for 50 M2 room at roof to give brightness enough to read in evenings. Here we design to give min 6 hours of illumination with some extras. This is if day have min 4 hours of sun light with no clouds.



Solar panels



All systems have a solar panel. We only use a European made solar panel rated of 144W or 240W at 24 VDC output. Or if hot and in areas with rain season thin film panels that have better output in these conditions. This is more power than normal as there are cloudy days where we need better margins to charge the battery system. Silicon Panel is 986x1656 mm meter and 20 kg in weight. At high altitude panels gives more than rated in output. 2000 meters altitude often gives 15-20% extra in output. Thin film panels are 600x1200 mm and gives 80W. They are bets in twilight and partial cloudy days and can handle high temperatures better.

Close to equator we install them on roof with a gap of min 150 mm to get some airflow under the panel for cooling.

Panels have a 25 Year expected life time and after this they works with 70% of original power. Surface is protected by tempered glass and is very strong.

Solar charge controller



Solar charge controllers based on MPPT technology. This is a micro processor controlled new generation of system that gives more power from solar panels compared to old models. The Maximum power tracking operation is better in all conditions and when cloudy or partial cloudy this helps a lot. Tests say we have 20-30% more charging in these conditions. This device can handle 40A at 24 Volt so if we add more panels this is OK and we have very safe margins to operation in warm climate.

Battery unit 12 volt 250AH solar battery of Gel type.



This is a heavy large specially made solar battery based on Gel design. This contains gel and no liquids and can be operated in any position. Weight is 73.5 Kg. Compared to car battery this will live about 10 X longer if deep cycled as here and if used in a warm area. When area is hot we add a fan cooler to get longer lifetime if temperature is over 30C when charged.

In extremely hot areas we have Lithium Battery units that can handle 60C in operation temperature

LED lamp system for indoor operation



Led lamp unit with 1000-1200Lumen out put. This consumes 10W of power and operate at 230 Volt from inverter. The design makes the angle of illumination wide so we cover room areas with a good illumination in all corners.

We have 4 of these units installed in a square to make light to cover all.Led

emitters have a 50000 hours life time and need much less energy that other lamps.

Compared to old style bulbs and halogen lamps we save 80-90% of electrical power.

Compared to fluorocent tubes we save 20% and we do not have any dangerous mercury in the lamps. Ambient light depends on colour of walls and floor but in normal cases this gives enough light to read with no problems

Other parts in the class room package

- * 25 meter 230 Volt cable 3x1,5 mm2 EKKL type
- * 2 pcs Switch to turn all on and off
- * 100 pcs clamps with nail for installation of the cable
- * 2 pcs Junction box with fuses etc.
- * Mounting hard ware.1 set.
- * Labels on all parts marked as agreed when ordered



Protection box in aluminium with lock



Electronics and battery is protected in a rugged aluminium box. The box is preferable bolted with expanders into a cement floor so none can remove it with ease.Here parts are protected and harder to steal. We include a lock with keys in the delivery.

At arrival all parts are included so it is easy to install and get it in operation.

This solution cover 1-2 class rooms of 50-100 M2