



Solar Wind Works

Renewable Energy Power Systems

P.O. Box 2511 • Truckee, CA 96160 • 1-877-682-4503 • Fax: 530-582-4603

The Basics of Solar Power



PV power generation systems are made up of interconnected components, each with a specific function. One of the major strengths of PV systems is modularity. As your needs grow, individual components can be replaced or added to provide increased capacity. Although the selected components will vary depending on the applications, PV systems generally conform to the schematic shown below. What follows is a brief overview of a typical PV system.

Solar Array

The solar array consists of one or more PV modules that convert sunlight into electric energy. The modules are connected in series and/or parallel to provide the voltage and current levels to meet your needs. The array is usually mounted on a metal pole and tilted to face the sun.

Charge Controller

Although charge controllers can be purchased with many optional features, their main function is to maintain the batteries at the proper charge rate, and to protect them from overcharging.

Battery Bank

The battery bank contains one or more deep cycle batteries, connected in series and/or parallel depending on the voltage and current capacity needed. The batteries store the power produced by the solar array and discharge it when you need it.



Inverter

An inverter is required when you want to power AC devices. The inverter converts the DC power from the solar array/batteries, into AC power.



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AC and DC Loads

These are the appliances (such as lights or radios), and the components (such as water pumps and microwave repeaters), which consume the power generated by your PV array.

Balance of System

These components provide the interconnections and standard safety features required for any electrical power system. These include: array combiner box, properly sized cabling, fuses, switches, circuit breakers and meters.



Off Grid PV System