



Glossary of Terms

Array -- An interconnected system of photovoltaic modules that function as a single electricity-producing unit. The modules are assembled as a discrete structure, with common support or mounting.

Alternating Current (AC)--A type of electrical current, the direction of which is reversed at regular intervals or cycles. In the United States, the standard is 120 reversals or 60 cycles per second. Electricity transmission networks use AC because voltage can be controlled with relative ease.

Balance of System -- Components other than the solar modules, mounting structure, and inverter. Used to describe the AC and DC breakers, fuses and other electrical safety components of a utility or grid tied solar electric system.

Battery -- Two or more electrochemical cells enclosed in a container and electrically interconnected in an appropriate series/parallel arrangement to provide the required operating voltage and current levels.

Battery Backup – The use of batteries to power your system in case of electrical power outage. Used for emergency back up only of critical loads.

Battery Cell — The simplest operating unit in a storage battery. It consists of one or more positive electrodes or plates, an electrolyte that permits ionic conduction, one or more negative electrodes or plates, separators between plates of opposite polarity, and a container for all the above.

Battery Energy Capacity — The total energy available, expressed in watt-hours (kilowatt-hours), which can be withdrawn from a fully charged cell or battery. The energy capacity of a given cell varies with temperature, rate, age, and cut-off voltage.

Battery Life — The period during which a cell or battery is capable of operating above a specified capacity or efficiency performance level. Life may be measured in cycles and/or years, depending on the type of service for which the cell or battery is intended.

Cell -- The smallest semiconductor element within a PV module to perform the immediate conversion of light into electrical energy.

Charge Controller — A component of a photovoltaic system that controls the flow of current to and from the battery to protect it from over-charge and over-discharge. The charge controller may also indicate the system operational status.

Days of Storage — The number of consecutive days the stand-alone system will meet a defined load without solar energy input. This term is related to system availability.

Direct Current (DC) -- A type of electricity transmission and distribution by which electricity flows in one direction through the conductor, usually relatively low voltage and high current. To be used for typical 120 volt or 220-volt household appliances, DC must be converted to alternating current using an DC/AC inverter.

Electrical Grid -- An integrated system of electricity distribution, usually covering a large area.

Gel-Type Battery -- Lead-acid battery in which the electrolyte is composed of a silica gel matrix.



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Grid-Tie System (GTS) -- A solar electric or photovoltaic (PV) system in which the PV array acts like a central generating plant, supplying power to the grid. Also called a Grid-Connected System.

Hybrid System — A solar electric or photovoltaic system that includes other sources of electricity generation, such as wind or diesel generators.

Irradiance — The direct, diffuse, and reflected solar radiation that strikes a surface, usually expressed in kilowatts per square meter. Irradiance multiplied by time equals insolation.

Inverter -- A device that converts direct current electricity to alternating current either for stand-alone systems or to supply power to an electricity grid.

Junction Box – A PV generator junction box is an enclosure on the module where PV strings are electrically connected and where protection devices can be located, if necessary.

Kilowatt -- A standard unit of electrical power equal to 1000 watts, or to the energy consumption at a rate of 1000 joules per second.

Kilowatt Hours -- 1,000 thousand watts acting over a period of 1 hour. The kWh is a unit of energy. 1 kWh=3600 kJ.

Lead-Acid Battery — A general category that includes batteries with plates made of pure lead, lead-antimony, or lead-calcium immersed in an acid electrolyte.

Maintenance-Free Battery — A sealed battery to which water cannot be added to maintain electrolyte level such as Gel and absorbed glass mat types.

Module – A structure with solar cells design and constructed in series to reach an operational voltage.

Net Metering -- The practice of exporting surplus solar power during the day (to actual power needs) to the electricity grid, which either causes the home owner electric meter to (physically) go backwards and/or simply creates a financial credit on the home owner's electricity bill. (At night, the homeowner draws from the electricity grid in the normal way).

Off-Grid System -- An autonomous or hybrid photovoltaic system not connected to a grid. May or may not have storage, but most off-grid systems require batteries or some other form of storage, also called a stand-alone system or remote system.

Panel -- often used interchangeably with PV module, but more accurately used to refer to a physically connected collection of modules.

Parallel Connection --A way of joining solar cells, photovoltaic modules, or photovoltaic panels by connecting positive leads together and negative leads together; such a configuration increases the current, but not the voltage.

Peak Sun Hours — The equivalent number of hours per day when solar irradiance averages 1,000 w/m². For example, six peak sun hours means that the energy received during total daylight hours equals the energy that would have been received had the irradiance for six hours been 1,000 w/m².

Photovoltaic (PV) -- Pertaining to the direct conversion of light into electricity known as Solar Electric and Solar Photovoltaic.



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Rack Mounts -- In a rack mount, the photovoltaic modules (solar panels) are supported by a metal framework and are set at a predetermined angle. The rack-mounted solar array is placed above the roof with the rack's members bolted to the roof's structural members.

Renewable Energy Resource -- An energy resource that is regenerative or virtually inexhaustible. Typical examples are wind, solar, geothermal, and water.

Sealed Battery — A battery with a captive electrolyte and a resealing vent cap, also called a valve-regulated battery. Electrolyte cannot be added. See maintenance free battery.

Series Connection -- A way of joining photovoltaic cells by connecting positive leads to negative leads; such a configuration increases the voltage.

Solar Energy -- Electromagnetic energy transmitted from the sun. Normally we deal with passive with construction materials to meet design criteria, photovoltaic for electricity and solar thermal for water heating.

Storage Battery — A device capable of transforming energy from electric to chemical form and vice versa. The reactions are almost completely reversible. During discharge, chemical energy is converted to electric energy and is consumed in an external circuit or apparatus.

Tilt Angle -- The angle at which a photovoltaic array is set to face the sun relative to a horizontal position. The tilt angle can be set or adjusted to maximize seasonal or annual energy collection.

Tracking Array — A PV array that follows the path of the sun to maximize the solar radiation incident on the PV surface. The two most common orientations are (1) one axis where the array tracks the sun east to west and (2) two-axis tracking where the array points directly at the sun at all times. Tracking arrays use both the direct and diffuse sunlight. Two-axis tracking arrays capture the maximum possible daily energy.

Volt -- A unit of electrical force equal to that amount of electromotive force that will cause a steady current of one ampere to flow through a resistance of one ohm.

Voltage -- The amount of electromotive force, measured in volts, that exists between two points.

Watt -- The rate of energy transfer equivalent to one ampere under an electrical pressure of one volt. One watt equals 1/746 horsepower, or one joule per second. It is the product of voltage and current (amperage).

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