Glossary: Solar Technician

Term	Definition
AC Disconnect	A component of a solar system that separates the inverter from the electrical grid.
Active Cell Balancing	An active balancing technique responsible for redistributing charges between battery cells amid charge and discharge cycles.
Alternating Current (AC)	An electric current that reverses its direction many times a second at regular intervals, typically used in power supplies.
Ampere	The International System of Units (SI) base unit of electrical current.
Ampere Hours	The possible amount of amperage a battery can output for an hour.
Arc	A discharge of electric current across a gap in a circuit. It is sustained by the presence of a thermally ionized column of gas (called a plasma) through which current flows. In general, atmospheric air is a poor conductor of electric current.
Azimuth	The angular measurement of the spherical coordinate system that expresses the angular distance between the south and north point of the horizon in which a vertical circle intersects the horizon.
Balance of Systems (B-o-S)	All components of a photovoltaic system other than the photovoltaic panels.
Battery Charger	Electric vehical charging that is capable of two-way charging. Electricity flows from the frid to the vehicle and vice versa.
Battery Energy Storage Systems (BESS)	A type of energy storage power station that uses a group of batteries to store electrical energy.
Battery Management System (BMS)	An electronic system responsible for managing rechargable batteries.
Bi-directional Inverter	The transference of power between a DC stage to its corresponding AC grid.
Build *(as part of DBOOT, the Solar Plant Life Cycle)*	Construction of the solar plant for the owner.
Bypass Diode	Part of the crystalline PV module. Its purpose is elimination of the hot-spot phenomena.
CapEx costs	The upfront capital expenses to design and build the solar installation.
C-Rate	The battery unit used to measure the speed in which batteries fully charge or discharge.
Constant Current	A DC type that does not change in intensity over time.
Constant Voltage	The ability to fluctuate output currents with the purpose of maintaining a set voltage.
Crimped	To compress (something) into small folds or ridges.
DBOOT	An acronym for the timeline of the solar plant life cycle.
DC Combiner	A device used in the PV source and PV output circuits to combine two or more dc circuit inputs and provide one dc circuit output.

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DC Disconnect	Switches that can interrupt the flow of DC (direct current).
DC Isolation Box	A component used between high voltage DC PV arrays and grid-connect inverters. They are located adjacent to the inverter and are required to provide a means of manually isolating the entire PV array during system installation or any subsequent maintenance.
Derate	Each component of a solar PV system has efficiency losses. System wiring has efficiency losses. Available online PV system sizing programs will factor in these efficiency losses when making calculations for system sizing. The solar industry refers to these as derate factors.
Design *(as part of DBOOT, the Solar Plant Life Cycle)*	The section of the Solar Plant Life Cycle presenting specification, energy estimates, and outlines.
Direct Current (DC)	An electric current flowing in one direction only.
Dual-axis Trackers	A tracking device used to track the sun with the purpose of collecting solar energy.
Electricity	A form of energy resulting from the existence of charged particles (such as electrons or protons), either statically as an accumulation of charge or dynamically as a current.
Feed-in Tariff	The electricity tariff set by the government.
Fixed-Tilt	A tracking system for the sun that utilizes two angles to determine the oriientation from the sun; the tilt and azimuth angles.
Flow Batteries	An electrochemical cell provided by two dissolved chemical components and pumped through a system from separate sides of the membrane.
Frameless Solar Panel	A solar panel that does not have any frame attached to it, which results in lower embodied energy and higher energy efficiency ratings.
Gel Cell	A battery using sulfuric acid mixed with fumed silica in order to create a gel-like, immobile substance.
Grounding Post	A type of construction in which vertical, roof-bearing timbers, called posts, are in direct contact with the ground.
Grouding Study	The first study performed at a solar plant, before the plant is turned on. The Grounding Study provides an alternative path for the current to return to the source (the panel), when the conventional way (via power return cable) is compromised, such as an open.
Heat	The exchange of "thermal" energy due to a temperature difference.
In Parallel	The main difference between wiring solar panels in series or parallel is the output voltage and current. When you wire numerous solar panels in parallel, their output currents add together, but their output voltages stay the same.
In Series	The main difference between wiring solar panels in series or parallel is the output voltage and current. When you wire multiple panels in series, their output voltages add together, and their output current remains the same. .

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Term	Definition
Inflation Reduction Act (IRA)	The Inflation Reduction Act of 2022 is a landmark United States federal law which aims to curb inflation by reducing the deficit, lowering prescription drug prices, and investing into domestic energy production while promoting clean energy.
Insolation	The amount of solar radiation reaching a given area.
Inverter	An apparatus which converts direct current into alternating current.
Investment Tax Credit (ITC)	The solar Investment Tax Credit (ITC) is one of the most important federal policy mechanisms to support the growth of solar energy in the United States. Since the ITC was enacted in 2006, the U.S. solar industry has grown by more than 200x - creating hundreds of thousands of jobs and investing billions of dollars in the U.S. economy in the process.
Junction Box	A box containing a junction of electric wires or cables.
Latitude	The angular distance from the north or south of Earth's equator, expressed in degrees.
Lead-Acid Batteries	A battery composed of two electrodes, both submerged in an electrolyte of sulfuric acid.
Lithium Ion Batteries	A rechargable battery utilizing the reversible reduction property of lithium ions to store energy.
Load	The draw of current within an electrical consumer.
Longitude	The angular distance from the east and west of the prime meridian on Earth, typicall expressed in degrees.
Maximum Power Point Tracking	A technique used with variable power sources to maximize energy extraction as conditions vary.
MC4 Connector	An MC4 connector is a single-contact electrical connector. It is commonly used for connecting solar panels. MC4 stands for “Multi-Contact, 4 millimetre”. It is a standard in the renewable energy industry. An MC4 connector enables the easy construction of strings of panels.
Micro-Inverters	The basic function of an inverter is to change the Direct Current (DC) power generated by your solar panels to Alternating Current (AC) that can be used to power your home. The type of inverter your choose affects the cost, efficiency, and monitoring ability of your solar system. Microinverters are mounted directly on each solar panel and convert the electrical current at the source of creation.
Non-Renewable Energy	A natural resource that cannot be readily replaced by natural means at a pace quick enough to keep up with consumption.
Off-take Agreement	A contract between the purchaser of clean energy and the operator of the solar plant.
Open Circuit Voltage (VOC)	The difference of electrical potential between two terminals of an electronic device when disconnected from any circuit.
Operate *(as part of DBOOT, the Solar Plant Life Cycle)*	To control the function of a system or machine.

Term	Definition
Operations & Maintenance (O&M) Cost	After solar energy arrays are installed, they must undergo operations and maintenance (O&M) to function properly and meet energy production targets over the lifecycle of the solar system and extend its life. There are significant costs associated with these ongoing O&M needs.
Own *(as part of DBOOT, the Solar Plant Life Cycle)*	The entity that possesses and operates Solar Plants.
Panel Array	A combination of panels connected in-series and parallel,
Passive Cell Balancers	Small converter cirucits used to balance cells via the transfer of energy from the highest to the lowest voltage cells.
Perovskite	Organic matter replicating the same crystal structure as mineral calcium titanium oxide.
Photo-voltaic Solar (PV Solar)	The conversion of light into electricity using semiconducting materials that exhibit the photovoltaic effect, a phenomenon studied in physics, photochemistry, and electrochemistry.
Power Purchase Agreement (PPA)	A set arrangement between a customer and third-party developer. The developer responsibilities include the installation, ownership, and operation of the energy system on the customer's property.
Production Tax Credit (PTC)	The production tax credit (PTC) is a per kilowatt-hour (kWh) tax credit for electricity generated by solar and other qualifying technologies for the first 10 years of a system's operation. It reduces the federal income tax liability and is adjusted annually for inflation.
Rated Current	The current flowing in an electrical device when it is supplied with the rated voltage and delivers its rated power.
Rated Voltage	The value of voltage used to designate the switchgear and to which is related its operating performance.
Receptor	Chemical structures, composed of protein, that receive and transduce signals that may be integrated into biological systems.
Rectifier	An inverter capable of bidirectional energy flow with high efficiency and high power density.
Renewable Energy	Energy from a source that is not depleted when used, such as wind or solar power.
Repowering *(as part of DBOOT, the Solar Plant Life Cycle)*	The replacement of the solar panels and/or the inverters, often both if newer technologies is no longer compatible with the original design.
Resistance	A force counteracting the flow of current.
Root Mean Square	The square root of the arithmetic mean of the squares of a set of values, used as a measure of the typical magnitude of a set of numbers, regardless of their sign.
Short Circuit Current	When an electrical current flows down an unintended path with very low impedance.

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Single-axis Trackers	Systems with a PV surface with the ability to rotate on a single axis in order to locate the best angle to receive optimum sunlight exposure.
Solar Cells	An electronic device that converts the energy of light directly into electricity by the photovoltaic effect, which is a physical and chemical phenomenon.
Solar Monitoring System	Measures information about your system's energy production, usually from solar inverters or a charge controller.
Solar Panel	A panel designed to absorb the sun's rays as a source of energy for generating electricity or heating.
Solar Thermal Energy	A form of energy and a technology for harnessing solar energy to generate thermal energy for use in industry, and in the residential and commercial sectors.
State-of-Charge	The degree of electric battery charge in relation to its capacity.
Stranded Wires	These thin, bundled wires are compressed and insulated with non-conductive materials.
String	A sequence of characters, either as a literal constant or as some kind of variable.
String Inverter	The basic function of an inverter is to change the Direct Current (DC) power generated by your solar panels to Alternating Current (AC) that can be used to power your home. The type of inverter your choose affects the cost, efficiency, and monitoring ability of your solar system. String inverters are mounted on your house and converts the electrical currents from all the solar panels in one central location.
Sulfation	Lead sulfate crystal build-up within the pores and on the surface of the battery lead plates' active material.
Thermal Cogeneration	The repurposing of unused energy that resulted from the production of separate concurring forms of energy emitted from a single fuel source.
Torque	A twisting force that tends to cause rotation.
Total Amount of Harmonic Distortion (THD)	A measurement that tells you how much of the distortion of a voltage or current is due to harmonics in the signal. THD is an important aspect in audio, communications, and power systems and should typically, but not always, be as low as possible.
Transfer *(as part of DBOOT, the Solar Plant Life Cycle)*	To move the object(s) from one space to another.
Valve-Regulated Lead Acid (VRLA) Batteries	A lead-acid battery type with limited, captive electrolyte amounts. Two forms exist: AGM (Absorbed glass mat) batteries absorb the electrolyte into a plate separator. Gel batteries/Gel cells transform the electrolyte into immobilized gel by mixing it with silica dust.
Wavelength	The distance between successive crests of a wave. Different wavelengths of light have different amounts of energy, meaning that solar panels will be more or less effective depending on the wavelength of light they are using.