

AC (Alternating Current) - The direction of electrical current reverses, usually many (60) times per second. Electricity transmission networks use AC because voltage can be controlled with relative ease.

AMPERE (amp) - A unit of electrical current or rate of flow of electrons. One volt across one ohm of resistance causes a current flow of one ampere. One ampere is equal to 6.235×10^{18} electrons per second passing a given point in a circuit.

ARRAY - An array is a mechanically integrated assembly of modules or panels together with support structure (including foundation and other components, as required) to form a free-standing field installed unit that produces DC power.

AZIMUTH - Angle between the north direction and the projection of the surface normal into the horizontal plane; measured clockwise from north. As applied to the PV array, 180 degree azimuth means the array faces south.

CELL (solar) - The smallest, basic Photovoltaic device that generates electricity when exposed to light.

DC (Direct Current) - A one way flow of electric current. Typical sources of direct currents are electric cells,

rectified power units and direct current generators. This is the current flow produced by a solar system. To be used for typical 120 volt or 220 volt household appliances, it must be converted to AC (alternating current).

DEPARTMENT OF ENERGY RESOURCES (DOER) -

The Massachusetts agency appointed to oversee utilities and energy production in Massachusetts.

DEPRECIATION TAX CREDIT

- A tax credit available to owners of commercial solar energy systems.

DOPING - Adding elemental impurities to silicon cells to create instability and produce a positive or negative charge when exposed to photons.

EFFICIENCY - The ratio of power output of a Photovoltaic cell to the incident power from the sun under specified standard insolation conditions.

GRID - Transmission line network used to distribute electric power.

INVERTER - A device that converts electricity from DC to AC.

INVESTMENT TAX CREDIT

(ITC) - A federal tax discount for taxes owed equivalent to 30% of the cost of installing a commercial or residential solar.

KILOWATT (kW) - 1000 watts.

KILOWATT-HOUR - Unit of energy used to perform work (energy and work are equivalent in units, energy being the potential value and work the achieved value. Example: The "average" American home uses about 24 kWh of electricity per day.

MODULE - The smallest non divisible, self-contained and environmentally protected physical structure housing interconnected Photovoltaic cells.

PANEL - A collection of one or more modules fastened together into a single unit, often factory pre- assembled and wired, forming a field-installable unit.

PEAK WATTS - The measurement of electricity produced by a solar generator at noon on a sunny day, under predetermined standard conditions.

PHOTON - The actual (physical) particle unit of light, as the electron is of electric charge and the atom and molecule are of matter.

PHOTOVOLTAIC CELL - A device composed of specially prepared semiconductor material or material combinations exhibiting the ability to convert incident solar energy directly into energy.



PHOTOVOLTAIC EFFECT - The phenomenon that occurs when photons, the "particles" in a beam of light, knock electrons loose from the atoms they strike. When this property of light is combined with the properties of semiconductors, electrons flow in one direction across a junction, setting up a voltage. With the addition of circuitry, current will flow and electric power will be available.

POWER PURCHASE

AGREEMENT (PPA) -

Contracting with a solar energy provider to provide you with solar power at a pre-determined price over an extended period of time. Most PPAs require the property owner to offer land or roof space as a host site for the array producing the electricity they are purchasing.

PARTNER FLIP AGREEMENT

- refers to partnership agreement allocating disproportionate high profits and losses from a solar undertaking to the investors, and then at a certain time in the future, switching the profits or losses to an allocation more beneficial to the developer.

RENEWABLE ENERGY -

Flows of energy that are regenerative or virtually inexhaustible. Most commonly includes solar (electric and thermal), biomass, geothermal, wind, tidal, wave, and hydro power sources.

RENEWABLE PORTFOLIO STANDARDS (RPS) -

Standards set by the state determining long and short

term goals for renewable energy production.

RENEWABLE ENERGY

CREDITS (RECS, SRECS)

- Certificates issued to solar energy producers for each megawatt of energy produced (1000 kW). These certificates are sold to utility companies who purchase them to meet the state RPS (see above). In Massachusetts, SRECS (Solar RECs) are issued to a system owner for the first 10 years of system production.

SEMICONDUCTOR -

A material such as silicon, which has a crystalline structure that will allow current to flow under certain conditions. Semiconductors are usually less conductive than metals but not an insulator like rubber.

SILICON -

A non-metallic element, that when specially treated, is sensitive to light and capable of transforming light into electricity. Silicon is the basic material of most beach sand, and is the raw material used to manufacture most photovoltaic cells.

SOLAR CELL -

The basic photovoltaic device which generates electricity when exposed to sunlight.

SOLAR LEASE -

A way to finance a solar array with little money upfront.

SOLAR PANEL - A collection of solar modules connected in series, in parallel, or in series-parallel combination to provide greater voltage, current, or power than can be furnished by a single solar module. Larger collections of solar

panels are usually called solar arrays.

STEP DOWN LOAN - A solar loan designed to allow for a re-amortization of the loan after receiving a majority of the tax incentives back and using them to pay down the loan balance.

TAX EQUITY FINANCING -

often used to refer to third-party ownership models in which an investor provides tax equity and the developer provides financing to the consumer. However, Tax Equity Financing could refer to other types of financing, including models that use New Market Tax Credits, among others.

TILT ANGLE - A fixed angle measured from the horizontal to which a solar array is tilted. The tilt angle is chosen to maximize the array output. Depending upon latitude, season and time of day this angle will vary.

TRACKING ARRAY - An array that is mounted on a movable structure that follows the path of the sun.

VOLTAGE - A measure of the force or "push" given the electrons in an electrical circuit; a measure of electrical potential. One volt produces one amp of current when acting against a resistance of one ohm.

WATT - Unit of power. Power is the rate of using energy to do work.

