

Chapter 2: Definitions

Definition of Terms

– A –

Absorber – That part of the solar collector which receives the incident radiation energy.

Absorptance – The collecting of heat, measured as percent of total radiation available.

Accessible (as applied to equipment) - Admitting close approach; not guarded by locked doors, elevation, or other effective means.

Accessible (as applied to wiring methods) - Capable of being removed or exposed without damaging the building structure or finish or not permanently closed in by the structure or finish of the building.

Accessible, Readily (Readily Accessible) - Capable of being reached quickly for operation, renewal, or inspections without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders, and so forth.

Air Mass – The ration of the mass of atmosphere, in the actual earth-sun path, to the mass which would exist if the sun were directly overhead at sea level.

Alternating-Current (ac) Module (Alternating-Current Photovoltaic Module) - A complete, environmentally protected unit consisting of solar cells, optics, inverter, and other components, exclusive of tracker, designed to generate ac power when exposed to sunlight.

Ambient Temperature – Surrounding temperature.

- ~~Angle of Incidence—The angle between the direct solar irradiation and the normal to the aperture plane.~~
- ***Angle of Incidence – The angle between the sun's rays and a line perpendicular to the array surface.***

Approved-Acceptable to the authority having jurisdiction.

Approved Testing Agency – An organization primarily established for purposes of testing to approved standards and approved by the Administrative Authority Having Jurisdiction.

Appurtenance, Solar – A manufactured device, a prefabricated assembly, or an on-the-job assembly of component parts, which is an adjunct to a solar system.

~~➤—Area, Absorber—The total projected heat transfer area from which the absorbed solar irradiation heats the transfer media.~~

Is this related to PV?

Area, Aperture – The maximum projected area of a solar collector through which the un-concentrated solar radiant energy is admitted.

Area, Gross Collector – The maximum projected area of the complete collector module, including integral mounting means.

Array-A mechanically integrated assembly of modules or panels with a support structure and foundation, tracker, and other components, as required, to form a direct-current power-producing unit.

Authority Having Jurisdiction (AHJ)-An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

– B –

Ballasting - The use of materials or weights to hold down the racking system of a solar installation. Ballasting generally does not require roof penetration or attachment to a structure.

Bipolar Photovoltaic Array - A photovoltaic array that has two outputs, each having opposite polarity to a common reference point or center tap.

Blocking Diode - A diode used to block reverse flow of current into a photovoltaic source circuit.

Bonded (Bonding) - Connected to establish electrical continuity and conductivity.

Bonding Jumper - A reliable conductor to ensure the required electrical conductivity between metal parts required to be electrically connected.

Bonding Jumper, Equipment - The connection between two or more portions of the equipment grounding conductor.

➤ ***BOS – Balance of System. An electrical or structural component, aside from a major component, that is required to complete a PV system.***

Building - A structure that stands alone or that is cut off from adjoining structures by fire walls with all openings therein protected by approved fire doors.

Building Code – As defined in ORS 455

- **Building Integrated Photovoltaics (*BIPV*)** - Photovoltaic cells, devices, modules, or modular materials that are integrated into the outer surface or structure of a building and serve as the outer protective surface of that building.

– C –

Charge Controller - Equipment that controls dc voltage or dc current, or both, used to charge a battery.

Code – When used alone shall mean these regulations, subsequent amendments thereto or any emergency rule or regulation which the Authority having jurisdiction may lawfully adopt. A standard that is an extensive compilation of provisions covering broad subject matter or that is suitable for adoption into law independently of other codes and standards.

Collector – See Solar Collector.

Collector, Concentrating – A solar collector which uses reflectors, lenses, or other optical elements to concentrate the radiant energy passing through the aperture onto an absorber of which the surface area is smaller than the aperture area.

- ~~Collector Tilt – The angle above horizontal at which a solar heat collector is positioned. Not relating to PV.~~
- **Collector Tilt – The vertical angle between horizontal and the array surface.**
- **Combiner Box – A junction box, certified for PV installation, used as the parallel connection point for two or more PV source circuits.**

Concentration Ratio – The ratio of the aperture area to the absorber area (in concentrating solar collectors).

Concentrator – Reflector or lens designed to focus solar energy into a reduced area.

Cover, Collector (Glazing) – The material covering the aperture to provide thermal and environmental protection.

– D –

Dead Load - The weight of materials of construction incorporated into the building, including but not limited to walls, floors, roofs, ceilings, stairways, built-in partitions, finishes, cladding and other similarly incorporated architectural and structural items, and

the weight of fixed service equipment, such as cranes, plumbing stacks and risers, electrical feeders, HVAC systems and fire sprinkler systems.

Diameter – Unless specifically stated, the term .diameter. is the nominal diameter as designated commercially.

Distribution System – That section of the solar system from the storage system to the point of use.

Diversion Charge Controller - Equipment that regulates the charging process of a battery by diverting power from energy storage to direct-current or alternating-current loads or to an interconnected utility service.

– E –

Electrical Code, (OESC) - For the purpose of this code, any reference to the Electrical Code shall mean the Oregon Electrical Specialty Code.

Electrical Production and Distribution Network - A power production, distribution, and utilization system, such as a utility system and connected loads that is external to and not controlled by the photovoltaic power system.

Emittance – The amount of heat radiated back from the solar collector, measured as percent of energy absorbed by the collector.

Existing Work – Existing work is a solar system or any part thereof which has been installed prior to the effective date of this Code.

– F –

Flat Plate Collector – A panel (non-concentrating type) of suitable material that converts solar energy into usable energy and the absorbing surface is essentially planar.

– G –

Ground - The earth.

Grounded (Grounding) - Connected (connecting) to ground or to a conductive body that extends the ground connection.

Grounded, Solidly - Connected to ground without inserting any resistor or impedance device.

Grounded Conductor - A system or circuit conductor that is intentionally grounded.

Grounding Conductor - A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode or electrodes.

Grounding Conductor, Equipment (EGC) - The conductive path installed to connect normally non-current-carrying metal parts of equipment together and to the system grounded conductor or to the grounding electrode conductor, or both.

FPN No. 1: It is recognized that the equipment grounding conductor also performs bonding.

FPN No.2: See also 250.118 for a list of acceptable equipment grounding conductors

Grounding Electrode - A conducting object through which a direct connection to earth is established.

Grounding Electrode Conductor - A conductor used to connect the system grounded conductor or the equipment to a grounding electrode or to a point on the grounding electrode system.

– H –

Hangers – See Supports.

Hazardous Material – Any substance or mixture of substances which is toxic, corrosive, flammable, an irritant, a sensitizer, and which presents a potential threat to the health of humans or animals.

Heliostat – A reflecting surface mounted on an axis to direct the sun's rays to a fixed point.

Hybrid System - A system comprised of multiple power sources. These power sources may include photovoltaic, wind, micro-hydro generators, engine-driven generators, and others, but do not include electrical production and distribution network systems. Energy storage systems, such as batteries, do not constitute a power source for the purpose of this definition.

– I –

➤ **Insolation – The rate of solar energy received on a unit surface in a unit time, typically expressed as kWh/m²/day or Peak Sun Hours (PSH).**

Interactive System - A solar photovoltaic system that operates in parallel with and may deliver power to an electrical production and distribution network. For the purpose of this definition, an energy storage subsystem of a solar photovoltaic system, such as a battery, is not another electrical production source.

Inverter - Equipment that is used to change voltage level or waveform, or both, of electrical energy. Commonly, an inverter [also known as a power conditioning unit (PCU) or power conversion system (PCS)] is a device that changes dc input to an ac output. Inverters may also function as battery chargers that use alternating current from another source and convert it into direct current for charging batteries.

Inverter Input Circuit - Conductors between the inverter and the battery in stand-alone systems or the conductors between the inverter and the photovoltaic output circuits for electrical production and distribution network.

Inverter Output Circuit - Conductors between the inverter and an ac panelboard for stand-alone systems or the conductors between the inverter and the service equipment or another electric power production source, such as a utility, for electrical production and distribution network.

- ***Irradiance*** – ***The instantaneous quantity of solar radiation incident on a unit surface area, typically measured in W/m^2 (power).***
- ***Irradiation, Instantaneous*** – ***The total quantity of solar radiation incident on a unit surface area in unit time, typically measured in Wh/m^2 (energy).***

Irradiation, Integrated Average – The solar radiation incident on a unit surface area during a specified time period divided by the duration of that time period.

– J – No Definitions

– K – No definitions

– L –

Labeled - Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.

- ~~***Langley*** – ***A unit of measurement of insolation, equal to 3.69 btu per square foot (1 gram-calorie per square centimeter).***~~

Relative to PV?

- **Listed (*Certified*)**- Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production of listed equipment or materials or periodic evaluation of

services, and whose listing states that either the equipment, material, or service meets appropriate designated standards or has been tested and found suitable for a specified purpose.

FPN: The means for identifying listed equipment may vary for each organization concerned with product evaluation, some of which do not recognize equipment as listed unless it is also labeled. Use of the system employed by the listing organization allows the authority having jurisdiction to identify a listed product.

Listing Agency – An agency approved by the Division and which maintains includes initial and ongoing product testing, a periodic inspection program on current production or of listed (certified) products models, and which makes available a published report of such listing in which specific information is included that the material or product conforms to applicable standards and has been tested to approved standards and found safe for use in a specified manner.

Live loads (roof)-Those loads produced (1) during maintenance by workers, equipment and materials; and (2) during the life of the structure by movable objects such as planters and by people.

Live Parts - Energized conductive components.

Lot – Lot means a single or individual parcel or area of land legally recorded or validated by other means acceptable to the Authority Having Jurisdiction on which is situated a building or which is the site of any work regulated by this code , together with the yards, courts, and unoccupied spaces legally required for the building or works, and which is owned by or is in the lawful possession of the owner of the building or works.

– M –

May – The word .may. is a permissive term.

Mechanical Code (OMSC) – For the purpose of this code, any reference to the Mechanical Code shall mean the Oregon Mechanical Specialty Code.

Module - A complete, environmentally protected unit consisting of solar cells, optics, and other components, exclusive of tracker, designed to generate dc power when exposed to sunlight.

– N –

No definitions

– O –

~~➔ Out Gassing – As applied to thermal energy, the thermal process by which materials expel gas. – Relative to PV?~~

– P –

- Panel - A collection of modules mechanically fastened together, wired, and designed to provide a field-installable unit, *also referred to as a STRING.*
- *Peak Sun – The maximum average terrestrial solar radiation received on a surface, at sea level, perpendicular to the sun's rays at solar noon, generally accepted as 1000 W/m^2 .*
- *Peak Sun Hours (PSH) – The total accumulated daily solar irradiation at a given site expressed in equivalent hours of Peak Sun, labeled as kWh/m^2 .*

Photolysis – Chemical decomposition caused by radiation.

Photosynthesis – The building up of chemical compounds with the help of radiation.

Photovoltaic – Relating to electricity produced by the action of solar radiation on a solar cell.

Photovoltaic Output Circuit - Circuit conductors between the photovoltaic source circuit(s) and the inverter or dc utilization equipment.

Photovoltaic Power Source -An array or aggregate of arrays that generates dc power at system voltage and current.

Photovoltaic Source Circuit - Circuits between modules and from modules to the common connection point(s) of the dc system.

Photovoltaic System Voltage - The direct current (dc) voltage of any photovoltaic source or photovoltaic output circuit. For multi-wire installations, the photovoltaic system voltage is the highest voltage between any two dc conductors.

Plenum – An air compartment or chamber to which one or more ducts are connected and which forms part of either the conditioned air supply, circulating air or exhaust air system, other than the occupied space being conditioned.

- *Pyranometer – A device used to measure ~~the total solar radiation~~ **irradiance** incident upon a surface ~~per unit time~~ per unit area.*

Pyrheliometer – A device used to measure the direct radiation on a surface normal to the sun's rays.

– Q –

No definitions

– R –

Racking - The material, supports, attachment, frame, skeleton used to attach a solar system to a building, other structure or directly on the ground.

Residential Code, (ORSC) - For the purpose of this code, any reference to the Residential Code shall mean the Oregon Residential Specialty Code.

Roughing-In – Roughing-in is the installation of all parts of the solar system which can be completed prior to the installation of fixtures or appurtenances. This includes electrical wiring, conduits, racking, equipment, and vent piping and the necessary supports prior to cover.

– S –

Selective Surface – A special coating applied to solar collectors, having high absorption and low emission factors.

Shall – Mandatory term indicates a mandatory requirement.

Size – See Diameter.

Solar Cell - The basic photovoltaic device that generates electricity when exposed to light.

Solar Photovoltaic System - The total components and subsystems that, in combination, convert solar energy into electric energy suitable for connection to a utilization load.

Solar Collector – A device used to absorb energy from the sun.

➤ ~~Solar Constant – The average amount of solar radiation reaching the earth's atmosphere per unit time (about 2 langleys per minute).~~ ***The average extraterrestrial solar power (irradiance) reaching the earth's outer atmosphere, with a value of approximately 1366W/m².***

Solar Photovoltaic System - The total components and subsystems that, in combination, convert solar energy into electric energy suitable for connection to a utilization load.

Solar System – As used in this code is any configuration of equipment and components to collect, convey, store and convert the sun's energy for a purpose.

Stand-Alone System - A solar photovoltaic system that supplies power independently of an electrical production and distribution network.

Standard Air – Air weighing 0.075 lb/ft³(1.2 kg/m³) and is equivalent in density to dry air at a temperature of 70°F (21.1°C) and standard barometric pressure of 29.92 in. Hg. (1.01 x 10⁵ kPa).

Stored Energy – Accumulated energy which is available for use.

➤ *String – see Panel.*

Structural Code, (OSSC) - For the purpose of this code, any reference to the Structural Code shall mean the Oregon Structural Specialty Code.

Supports – Supports, hangers, and anchors are devices for properly supporting and securing pipe, appurtenances, fixtures, and equipment.

– T –

Total Incident Irradiation – The total solar radiant energy incident upon a unit surface area during a specified time period, expressed in ~~btu/ft²(J/m²)~~ **Wh/m²** .

– U –

Utility-Interactive Inverter - An inverter intended for use in parallel with an electric utility to supply common loads that may deliver power to the utility.

– V –

Venetian Blind Collector – A solar collector in which movable vanes are employed to absorb or reject energy.

– W –

No definitions

– X –

No definitions.

– Y –

No definitions.

– Z –

No definitions.