

Please request an Energy Trust verification for battery-based system. For a system without batteries, use *Form 231: Solar Electric Installation Checklist*

### Project Information

Energy Trust Verifier		Verification Date(s) 1 <sup>st</sup> :                      2 <sup>nd</sup> :		Time of Measurement
System Owner	<input type="checkbox"/> Form 220R <input type="checkbox"/> Form 220C <input type="checkbox"/> Form 220T	Trade Ally Contractor		PowerClerk #
Site Address		City	Zip	
Ambient Temperature (°F)	Solar Radiation (W/m <sup>2</sup> )	Inverter Output (watts <sub>AC</sub> )	Initial Meter Reading	

### Installation Checklist (Requirement numbers refer to sections of the [Solar Electric Installation Requirements.](#))

Verification 1 <sup>st</sup> 2 <sup>nd</sup>	2.1	General
<input type="checkbox"/> <input type="checkbox"/>	2.1.1	System installed on real property in Oregon and grid-tied to <input type="checkbox"/> PGE or <input type="checkbox"/> Pacific Power.
<input type="checkbox"/> <input type="checkbox"/>	2.1.2	System meets local utility interconnection and net metering requirements, if applicable.
<input type="checkbox"/> <input type="checkbox"/>	2.1.3	Installation is of industry standard and workmanlike quality.
<input type="checkbox"/> <input type="checkbox"/>	2.1.4	System is designed to optimize annual performance, without sacrificing good aesthetics.
<input type="checkbox"/> <input type="checkbox"/>	2.1.5	Installation is consistent with schematic diagram and documentation.
<input type="checkbox"/> <input type="checkbox"/>	2.1.6	System complies with all applicable codes and jurisdictional inspection(s) have been passed. Permit # _____ Date _____
	<b>2.2</b>	<b>Materials</b>
<input type="checkbox"/> <input type="checkbox"/>	2.2.1	Materials used outdoors are UV-resistant and listed for outdoor locations.
<input type="checkbox"/> <input type="checkbox"/>	2.2.2	Materials are designed to withstand the temperatures to which they are exposed.
<input type="checkbox"/> <input type="checkbox"/>	2.2.3	Dissimilar metals that have galvanic action are isolated.
<input type="checkbox"/> <input type="checkbox"/>	2.2.4	Aluminum is not placed in direct contact with concrete.
<input type="checkbox"/> <input type="checkbox"/>	2.2.5	High quality fasteners are used.
<input type="checkbox"/> <input type="checkbox"/>	2.2.6	Structural members are made of approved materials.
	<b>2.3</b>	<b>Equipment and Installation</b>
<input type="checkbox"/> <input type="checkbox"/>	2.3.1	All system components are new.
<input type="checkbox"/> <input type="checkbox"/>	2.3.2	All components are mounted securely.
<input type="checkbox"/> <input type="checkbox"/>	2.3.3	All electrical components are listed and meet required standards.
<input type="checkbox"/> <input type="checkbox"/>	2.3.4	Inverter and modules meet minimum warranty requirements.
<input type="checkbox"/> <input type="checkbox"/>	2.3.5	All electrical components are listed for the voltage and current ratings necessary for the application.
<input type="checkbox"/> <input type="checkbox"/>	2.3.6	Equipment is not modified such that it voids the listing or manufacturer warranty.
<input type="checkbox"/> <input type="checkbox"/>	2.3.7	Required overcurrent protection devices installed and accessible.
<input type="checkbox"/> <input type="checkbox"/>	2.3.8	Means of inverter disconnection are installed and designed to be safely switched under load.
<input type="checkbox"/> <input type="checkbox"/>	2.3.9	Terminations torqued to specification, secured, and strain-relieved. Wire ends coated with anti-corrosive compound.
<input type="checkbox"/> <input type="checkbox"/>	2.3.10	Conduit, conductors, and electrical boxes are secured and supported according to code and product ratings.
<input type="checkbox"/> <input type="checkbox"/>	2.3.11	Grounding conductors (EGC and GEC) are copper and 6 AWG or sized according to Code.
<input type="checkbox"/> <input type="checkbox"/>	2.3.12	Twist-on wire connectors are not used on DC conductors or ground wires.
<input type="checkbox"/> <input type="checkbox"/>	2.3.13	Junction boxes and combiner boxes are listed and suitable for their environment and conditions of use.
<input type="checkbox"/> <input type="checkbox"/>	2.3.14	Permanent labels are applied to system components as required by Code.
<input type="checkbox"/> <input type="checkbox"/>	2.3.15	Disconnect switch cover plates (not switch handles) are secured closed for safety.
<input type="checkbox"/> <input type="checkbox"/>	2.3.16	If micro-inverter system, includes equipment that allows local monitoring and has appropriate AC disconnect switch on each inverter output circuit.

Please request an Energy Trust verification for battery-based system. For a system without batteries, use **Form 231: Solar Electric Installation Checklist**

<b>2.4</b>		<b>Array Mounting</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.4.1 If roof-mounted, the roofing material has at least 10 years of useful life remaining.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.2 If roof-mounted, the roof system is capable of handling additional load of the System.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.3 Array racking and mounting systems engineered and installed to meet wind, snow and seismic load requirements.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.4 All roof penetrations made watertight using roofing industry-standard methods of flashing.
<input type="checkbox"/>	<input type="checkbox"/>	2.4.5 All mounting hardware is installed according to manufacturer specifications.
<b>2.5</b>		<b>Solar Access</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.5.1 Solar resource is documented with an Energy Trust approved tool from location where shading is most significant.
<input type="checkbox"/>	<input type="checkbox"/>	2.5.2 Total Solar Resource Fraction (TSRF) is 75% or greater at all points on the array(s).
<b>2.6</b>		<b>Performance</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.6.1 Array sized to operate within the inverter current, voltage and power limits at the record high and low temperatures.
<input type="checkbox"/>	<input type="checkbox"/>	2.6.2 Wires sized to keep voltage drop at or below 2% in the DC conductors from the array to the inverter.
<input type="checkbox"/>	<input type="checkbox"/>	2.6.3 Wires sized to keep voltage drop at or below 2% in the AC conductors from the inverter to the service panel.
<input type="checkbox"/>	<input type="checkbox"/>	2.6.4 Voltage mismatch is minimized, allowing the inverter to operate within its maximum power point window.
<b>2.7</b>		<b>Output Meter</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.7.1 A qualifying production meter is installed on the AC output of the System.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.2 If multiple-inverter system, output combined before meter or one electric meter installed for each inverter.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.3 UV-resistant label identifying meter as the Solar Generator Output.
<input type="checkbox"/>	<input type="checkbox"/>	2.7.4 Meter reading consistent with setting of 000000 or 999999 at time of shipment to the installer.
<b>2.8</b>		<b>Battery-Based System</b>
<input type="checkbox"/>	<input type="checkbox"/>	2.8.1 Batteries are located in a secure enclosure that meets seismic requirements and is weatherproof as needed.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.2 Access to live battery terminals is limited per Oregon Electrical Specialty Code.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.3 Flooded lead acid batteries are housed in an enclosure with adequate spill containment and vented to the outdoors, with a nearby clearly marked safety kit.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.4 Battery interconnect and inverter cables are properly sized, with secured crimps and lugs on ends. Lugs and terminals are listed for the wire type used.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.5 Charge controller and inverter settings are appropriate for the batteries, and set for grid-tied optimum performance.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.6 Temperature compensation probes for inverter and/or charge controller are installed to control battery charge.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.7 Array configuration operates within current and voltage limits of charge controller, accounting for temperature-adjusted array voltage under record high and low temperatures for the location.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.8 For hybrid systems utilizing wind or micro-hydro turbines in addition to PV, battery overcharge protection uses turbine regulation and/or diversion controller and diversion load is installed.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.9 Ground fault protection is added to the System if required by code and not included in the inverter.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.10 Customer manual include instructions for operation, maintenance and safety procedures for batteries, charge controller and inverter.
<input type="checkbox"/>	<input type="checkbox"/>	2.8.11 AC output meter is 5-jaw type and correctly wired to meter power flows to both utility and AC loads.
<b>3.0</b>		<b>Customer Manual</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Complete and accurate System Overview page <input type="checkbox"/> Operation & maintenance instructions <input type="checkbox"/> Electrical as-built diagram <input type="checkbox"/> Mechanical Design <input type="checkbox"/> Contractor 2-yr parts & labor warranty <input type="checkbox"/> Manufacturer warranties
		<input type="checkbox"/> Energy Trust 220 Incentive Application <input type="checkbox"/> Permit(s) <input type="checkbox"/> Utility interconnection / net metering agreement <input type="checkbox"/> Parts and source list <input type="checkbox"/> Inverter owner's manual <input type="checkbox"/> Manufacturer data sheets for major components
		<b>Owner Education</b>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Owner understands basic system operation. <input type="checkbox"/> Owner understands proper shut-down and start-up procedure. <input type="checkbox"/> Owner understands potential performance impacts of shading. <input type="checkbox"/> Owner understands required maintenance. <input type="checkbox"/> Owner knows who to call in the case of an emergency. <input type="checkbox"/> Owner can accurately read meter.