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**PHOTOVOLTAIC (PV) SYSTEMS REQUIREMENTS**

 **FOR NEW SINGLE-FAMILY RESIDENTIAL BUILDINGS**

Effective Jan 1, 2023 the new 2022 California Energy Code Section 150.1(c)14 requires all single-family residential buildings shall have a newly installed photovoltaic (PV) system when using prescriptive compliance approach/component packages for newly constructed buildings. Photovoltaic (PV) systems are not required for additions [per § 150.2(a) exception 5]. The 2022 California Energy Code now classifies these buildings as single-family buildings: single-family dwellings, duplexes, townhouses of any height, and accessory dwelling units (ADU).

The annual electrical output of the PV system shall be no less than the smaller of a PV system size determined using Equation 150.1-C, or the maximum PV system size that can be installed on the building’s Solar Access Roof Area (SARA).

1. **SARA includes** the area of the building’s roof space capable of structurally supporting a PV system, and the area of all roof space on covered parking areas, carports, and all other newly constructed structures on the site that are compatible with supporting a PV system per California Building Code § 1511.2.
2. **SARA does NOT include:**
3. Any roof area that has < 70% annual solar access. Annual solar access is determined by dividing the total annual solar insolation, accounting for shading obstructions, by the total annual solar insolation if the same areas were unshaded by obstructions. For steep slope roofs only shading from existing permanent natural or manmade obstructions that are external to the dwelling, including but not limited to trees, hills, and adjacent structures, shall be considered for annual solar access calculations. For low slope roofs, all obstructions including those that are external to the dwelling unit, and obstructions that are part of the building design and elevation features shall be considered for the annual solar access calculations.
4. Occupied roof areas as specified by CBC § 503.1.4.
5. Roof area that is otherwise not available due to compliance with other building code requirements if confirmed by the California Energy Commission Executive Director.

**EQUATION 150.1-C**

**ANNUAL PHOTOVOLTAIC ELECTRICAL OUTPUT**

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| **kWPV = (CFA × A)/1000 +(NDU × B)** |

where:

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| kWPV = kWdc size of the PV system | A = CFA adjustment factor from Table 150.1-C (i.e., A = 0.627 for Ontario climate zone 10) |
| CFA = Conditioned floor area | B = Dwelling unit adjustment factor from Table 150.1-C (i.e., B = 1.41 for Ontario climate zone 10)  |
| NDU = Number of dwelling units |  |

**EXCEPTIONS:**

1. **Steep-Sloped Roofs:** SARA shall not consider roof areas with a northerly azimuth that lies between 300 degrees and 90 degrees from true north. No PV system is required if the SARA is < 80 contiguous ft2.
2. **Minimum PV System Size Specified By § 150.1(C)14 < 1.8 kWdc:** No PV system is required.
3. **Snow Loads:** Buildings with enforcement-authority-approved roof designs, where the enforcement authority determines it is not possible for the PV system, including panels, modules and components and supports and attachments to the roof structure, to meet the requirements of the American Society of Civil Engineers (ASCE), Standard 7-16, Chapter 7, Snow Loads.
4. **Reduced PV kW in Subdivisions:** For buildings that are approved by the local planning department prior to January 1, 2020 with mandatory conditions for approval:
5. Shading from roof designs and configurations for steep-sloped roofs, which are required by the mandatory conditions for approval, shall be considered for the annual solar access calculations; and
6. Roof areas that are not allowed by the mandatory conditions for approval to have PVs, shall not be considered in determining the SARA.
7. **Reduced PV kW with Battery Storage Systems:** PV system sizes determined using Equation 150.1-C may be reduced by 25% if installed in conjunction with a battery storage system. The battery storage system shall meet the qualification requirements specified in Joint Appendix JA12 and have a minimum usable capacity ≥ 7.5 kWh.