

# **California Solar Initiative Program Reservation Application Guide Non-Photovoltaic Technologies Performance Based Incentives**

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## **Background**

This application guide provides key information for reserving California Solar Initiative (CSI) performance based incentives (PBI) for non-PV technologies.

### **Non-PV Eligibility (CSI Handbook, Section 2.2.3)**

Eligible non-PV electric generators and solar thermal technologies, include –

- Fixed and tracking flat plate solar thermal collectors
- Concentrating solar thermal (trough, dish and lens).

Solar collector technologies can be integrated with additional equipment to convert solar thermal energy to electricity or cooling.

Eligible Non-PV technologies must serve end-use loads that displace electric purchases. Eligible electric end-use loads include –

- Electric space conditioning (heating, cooling and dehumidification)
- Electric industrial process heating & cooling
- Any electric load (for non-PV electric generators)

Note that solar water heating for domestic use is not eligible for CSI funding.<sup>1</sup>

Non-PV equipment must be safety certified by an NRTL.

Non-PV system performance parameters must be established by SRCC for flat plate collectors or Sandia National Laboratories for concentrating solar systems.

### **Performance Ratio (CSI Handbook, Section 2.2.6)**

The Performance Ratio ( $P_R$ ) is a conversion factor used to determine the amount of grid electricity that is displaced by the non-PV technology. The value of the Performance Ratio depends on the type of non-PV technology, the end-use equipment being displaced and, if applicable, any conversion equipment used with the non-PV equipment to serve the end-use load (e.g., absorption chillers).

For non-PV electric generators,  $P_R = 1.0$ .

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<sup>1</sup> CPUC RESOLUTION E-4162, April 24, 2008

For solar thermal cooling systems,  $P_R$  is the minimum standard conversion efficiency of the displaced end-use equipment divided by the conversion efficiency of the absorption system, if applicable.

The minimum efficiency standard for the displaced end-use electric equipment is dependent on the type and size of the conventional electric heating or cooling system being displaced. The most common equipment minimum efficiency standards can be found in the statewide Standard Performance Contract energy efficiency program or the California Appliance Efficiency Regulations.

## **Non-PV System Capacity Rating (CSI Handbook, Section 2.2.6)**

For non-PV electric generators, the CEC-AC rating is the net electric output [kW] of the system at PTC<sup>2</sup>.

For non-PV thermal systems, the CEC-AC rating is the rated thermal capacity at PTC divided by the Performance Ratio ( $P_R$ ). If the solar system's total ancillary electric load is 5% or more of the unadjusted CEC-AC rating, it must be subtracted from the unadjusted CEC-AC rating.

## **Non-PV System Annual Production Estimate**

Non-PV system annual electric production or electricity displaced must be estimated using performance parameters established by SRCC or Sandia National Laboratories, and site specific typical meteorological year weather data. Acceptable models are the Solar Advisory Model (<https://www.nrel.gov/analysis/sam>) or TRNSYS (<http://sel.me.wisc.edu/trnsys>). Other modeling approaches may be considered on a case by case basis by the Program Administrator.

## **Estimated Annual Electric Load**

For non-PV electric generators, Applicants are required to submit either 12-months of historical annual electric consumption or, in the case of new or expanded load, an estimate of annual electric load for the Host Customer Site.

For non-PV thermal systems, Applicants are required to submit an annual electric consumption estimate of the served end-use using engineering calculations or a model of the heating or cooling load assuming minimum efficiency rating for the conventional system.

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<sup>2</sup> The PTC (PVUSA Test Conditions) rating is based upon 1,000 Watts/m<sup>2</sup> Global Normal Irradiance (GNI) and 850 Watts/m<sup>2</sup> Direct Normal Irradiance (DNI), 20° Celsius ambient temperature, and 1 meter/second wind speed. Note for rating flat plate collectors GNI should be used. For concentrating systems, DNI should be used.