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CEC-70 (Revised 2/26)

IN THE MATTER OF: *Solar Equipment Lists Program Implementation*	DOCKET NO. 26-SOLAR-01 REQUEST FOR INFORMATION RE: Solar Equipment Lists Guidelines Update

Request for Information
Solar Equipment Lists Guidelines Update
Written Comments Due: June 17, 2026, at 5:00 p.m. PDT

The California Energy Commission (CEC) seeks input and comments on topics for potential modifications to the Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1), Seventh Edition (Guidelines). The Guidelines, in part, describe the requirements for submitting information to the CEC to include certain solar energy system equipment in the CEC's Solar Equipment Lists (SEL). The equipment lists are typically referenced by utilities and local jurisdictions at their discretion to facilitate the interconnection of and the permitting of certain solar energy systems deployed by customers.

To facilitate information gathering and to help inform modifications to the Guidelines that may be proposed by CEC staff later in 2026, staff seek feedback from industry and other interested members of the public primarily on the two questions in the Comments Request section of this document. Staff welcomes comment on the additional modifications listed in Attachment A that staff are considering. Comments are due on June 5, 2026.

Background

The CEC initially developed the Guidelines in response to Senate Bill 1 (Murray, Chapter 132, Statutes of 2006) to establish criteria and standards for the solar incentive programs under the California Solar Initiative (CSI), including the New Solar Homes Partnership (NSHP). One purpose of the Guidelines was the establishment of mandatory eligibility requirements for photovoltaic (PV) modules, inverters, and meters that could be used in solar energy systems receiving incentives under the CSI. Equipment eligibility requirements include meeting national safety standards and California specific performance standards. Equipment meeting the eligibility requirements was publicly

communicated in the form of the CEC's Solar Equipment Lists. In 2018, the lists were expanded to include batteries and battery energy storage systems (ESS).

Manufacturers are not required to include their products in the SEL to do business in California. However, some electric utility companies and local government jurisdictions may require certain distributed energy resource system equipment deployed by customers to be on the SEL for the purposes of facilitating utility interconnection or for local permitting. Qualification for certain funding incentives or to participate in certain programs may require products to be included in the SEL.

The Guidelines containing the equipment list eligibility requirements were last updated in December 2018. CEC staff plans to propose modifications to the Guidelines later in 2026.

Comments Request
The CEC requests information and feedback on the two questions below. Industry and other interested members of the public may respond to either or both questions in this request for information (RFI). Staff also welcomes comments on the additional items identified in Attachment A that staff are considering proposing.

(1) Should the CEC continue making the calculated value for the Photovoltaics for Utility Scale Applications (PVUSA) Test Conditions (PTC) rating of a PV module available?

The CEC has been providing stakeholders with PTC ratings for PV modules for over 20 years because the PVUSA test conditions are considered a better reflection of "real-world" solar and climatic conditions compared to the standard test conditions (STC) rating of a PV module. The primary use case for the PTC rating was transitioning capacity-based PV incentive programs in California to pay on a dollar per PTC Watt basis instead of a dollar per STC Watt basis. Later, when PV incentive programs in California evolved to pay on an estimated annual energy generation basis, the PTC/STC ratio was used as a scaling factor by some of these programs, including the California Solar Initiative (CSI). See the PV User Guide for the CSI-EPBB calculator for further explanation. The current use case for the PTC rating, particularly by utilities, is for estimation of a PV array's alternating current (AC) capacity using the following equation:

$$\begin{aligned} &estimated\ AC\ capacity\ of\ PV\ array \\ &\quad = number\ of\ PV\ modules * PTC\ rating \\ &\quad * CEC\ weighted\ inverter\ efficiency. \end{aligned}$$

The PTC rating is a CEC calculated value which relies on a PV module's nominal STC rating, a laboratory tested value for a PV module's maximum power temperature

coefficient, and a laboratory tested value for the nominal operating cell temperature (NOCT) parameter. See Attachment B for details on the calculation of the PTC rating.

NOCT is a measurement of PV module temperature at 20 degrees Celsius ambient temperature, 800 watts per square meter irradiance, and one meter per second wind speed with the PV module open-circuited. Measurement of NOCT was included in International Electrotechnical Commission (IEC) 61215:2005 *PV module design qualification and type approval*. Measurement of NOCT was removed when IEC 61215-2:2016 was issued and replaced with measurement of Nominal Module Operating Temperature (NMOT). There are several differences between NMOT and NOCT, with the primary difference being that NMOT is measured with the PV module under load rather than open-circuited. Because of these differences, NMOT cannot not be used as a drop-in replacement for NOCT in the equation used by the CEC to calculate the PTC rating. Subsequently, measurement of NMOT was removed when IEC 61215-2:2021 was issued, and there is no longer any test procedure for measurement of PV module operating temperature in IEC 61215-2:2021.

Since the removal of measurement of NOCT from IEC 61215:2016, the CEC has continued to require that PV module manufacturers submit a laboratory tested value for NOCT to the CEC so that the PTC rating, which remains used by some stakeholders, can be calculated. Measurement of NOCT requires use of a test procedure from IEC 61215:2005, a standard that has been formally withdrawn by the IEC. Some manufacturers have expressed concern about the cost of continuing to provide the CEC with a laboratory tested value for NOCT. Some testing laboratories have expressed concern to the CEC about continued use of the withdrawn IEC 61215:2005 standard and a few testing laboratories report they no longer provide measurement of NOCT services for PV module manufacturers. Presumably, these testing laboratories would have similar concerns about use of a test procedure from the withdrawn IEC 61215-2:2016 standard for the measurement of NMOT.

One possible alternative to the PTC rating is to use one or more fixed PV module derate factors based on the PTC/STC ratio for the 22,000 PV modules for which the CEC already has a PTC rating.

Table 1: Average PTC to STC ratios of PV modules for which the CEC has a PTC rating

Description	Average PTC/STC ratio
All PV modules for which the CEC has a PTC rating	0.92114
All non-building integrated PV (BIPV) modules	0.92125
All BIPV PV modules	0.89609
All PV modules with a power rating less than or equal to 300 Watts	0.90163
All PV modules with a power rating greater than 300 Watts	0.92943
All monocrystalline PV modules	0.92647
All polycrystalline PV modules	0.90265
All thin film PV modules	0.92759

Another alternative is to use the maximum AC output capacity of the inverter as an estimate for the AC capacity of a PV array.

Should the CEC continue making the calculated value for the PTC rating of a PV module available?

- If yes, how should the CEC balance or address the concerns of some manufacturers about the cost of continuing to provide the CEC with the laboratory tested value for NOCT used in the calculation of the PTC rating and the reduced availability of laboratory testing services to PV module manufacturers for measurement of NOCT?
- If no, why not?
- Are the suggested potential alternatives discussed above satisfactory for addressing the current use case for estimating the AC capacity of a PV array?
- Are there other suggested alternatives or use cases to consider?

(2) When staff find equipment on the SEL that does not have a current certificate of compliance for the CEC required national safety standard, should the equipment be moved to an archive equipment list without notifying the manufacturer?

To be included in the SEL, a manufacturer must provide a valid certificate of compliance, issued by a Nationally Recognized Testing Laboratory (NRTL), for each equipment model number, demonstrating conformity with the national safety standard applicable to that equipment type. When a product has certification from a NRTL, it indicates the product has been evaluated by the NRTL to conform with the current edition of the applicable standard and can apply the NRTL's certification mark to the product. Additionally, as part of its certification program, the NRTL is required by the Occupational Safety and Health Administration (OSHA) to conduct follow-up inspections

of actual production of certified products.[1] For example, a manufacturer seeking to include a model number of an energy storage system in the SEL must submit a valid certificate of compliance from a NRTL for UL 9540, Energy Storage Systems and Equipment, that identifies the exact model number. Verifying that each product has a valid certification to the applicable national safety standard is a critical component of CEC staff's review of manufacturer requests to add their equipment to the SEL. For public transparency purposes, some have argued that the SEL should only include products with a certificate of compliance for the current edition of the applicable national safety standard.

National safety standards are periodically updated. For instance, UL 9540 Edition 1 was published in September 2016, Edition 2 in February 2020, and Edition 3 in June 2023. The effective date of a new edition, when all newly submitted products must be evaluated by the NRTL to meet the new requirements, is typically 12 to 24 months, or longer, after publication. For example, the effective date of the third edition of UL 9540 was August 29, 2025.[2] The impact of a new edition on products already certified to an earlier edition is determined by the NRTL that performed the original evaluation. As understood by CEC staff, the possible outcomes of this case-by-case determination for previously certified products include:

a. The NRTL determines the product meets the new edition of the standard without re-evaluation and the product's certification remains valid after the new edition's effective date.

b. The NRTL determines the product must be re-evaluated for the new edition. The manufacturer proceeds with re-evaluation, makes any necessary modifications, and the NRTL confirms compliance with the new edition of the standard prior to its effective date. The product's certification remains valid after the effective date of the new edition of the standard.

c. The NRTL determines the product must be re-evaluated for the new edition. If the manufacturer withdraws the certification, chooses not to make the required modifications, or the NRTL does not confirm compliance before the effective date, products manufactured on or after the effective date of the new edition of the standard are not certified. Certification remains valid for products manufactured before the effective date of the new edition of the standard.

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[1] (NRTL) Program - FAQ, "What is a Nationally Recognized Testing Laboratory (NRTL)?" Accessed at https://www.osha.gov/nationally-recognized-testing-laboratory-program/frequently-asked-questions on May 11, 2026.

[2] Intertek Standards Update Notice ANSI/CAN/UL 9540. Accessed at https://www.intertek.com/siteassets/resources/sun/2024/ansi-can-ul-9540-sun-rev-6-28-2023-ed-8-29-2025.pdf on May 11, 2026.

CEC staff can remove a product from the SEL "for any reason that adversely affects the goals or successful implementation of the program, including, but not limited to, an invalid or expired safety certification."[3] Staff perform an ad-hoc review of products on the SEL for valid certification by a NRTL because the only time staff has certainty of a product's certification status is when staff review the manufacturer's initial submission of product information to the CEC for potential inclusion of the product in the SEL. When staff find a product is no longer certified during the ad-hoc review, they notify the manufacturer, as described in Appendix B of the Guidelines. If the manufacturer is non-responsive, or confirms the product is no longer certified, staff place a public notification on the program webpage. Thirty calendar days after the public notification, staff remove the product from the SEL and place it on an archive equipment list. Staff are only able to review a small number of products in the SEL for certification status due to the laborious nature of the individual product review and the large number of products in the SEL. This often results in products remaining in the SEL even when they are no longer certified in accordance with the current edition of the applicable safety standard. For example, the safety standard applicable to energy storage systems (ESS) is the third edition of UL 9540. However, there are over 500 model numbers of ESS on the SEL that were initially submitted to the CEC with certification for the first edition of UL 9540. The CEC does not have adequate resources to verify if each of these model numbers has certification for the third edition of UL 9540.

Someone using a product on an archive equipment list may find the process of obtaining utility interconnection permission to operate or a local government permit to be more challenging if a utility or local government that uses SEL data is not aware of, or does not accept, the archive equipment list. The archive equipment list has fewer data fields than the SEL which may present an additional challenge; however, the available fields in an archive equipment list can be modified or increased to match those in the SEL.

When staff find equipment on the SEL that does not have a current certificate of compliance for the CEC required national safety standard, should the equipment be moved to an archive equipment list without notifying the manufacturer?

- If yes, why?
- If yes, when should staff review equipment certification after publication of a new edition of a standard? For example, on the new edition's effective date, 12 months after the new edition's effective date, or an alternative timeframe, and why?
- If no, equipment could remain in the SEL indefinitely regardless of whether it has certification in accordance with the current edition of the applicable national safety standard. In this case, why not?

[3] Guidelines for California's Solar Electric Incentive Programs (Senate Bill 1), Seventh Edition, p. A-2.

Submitting Comments to the CEC

Written comments must be submitted to the Docket before **5:00 p.m. PDT on June 17, 2026**. Written comments, attachments, and contact information (for example, address, telephone number, email address) will become part of the public record, with access available via any internet search engine.

The CEC encourages use of its electronic commenting system. To submit your comments electronically, visit the e-commenting page for this Docket. Enter your contact information and a comment title describing the subject of your comment(s). Comments may be included in the "Comment Text" box or attached in a format consistent with California Code of Regulations, Title 20 section, 1208.1. The maximum file size is 10 MB.

Written materials may also be submitted by email. Include the docket number 26-SOLAR-01 and "Solar Equipment Lists Guidelines Update" in the subject line and send to docket@energy.ca.gov.

Alternatively, a paper copy of your comments may be mailed to:

California Energy Commission
Docket Unit
Re: Docket No. 26-SOLAR-01
715 P Street
Sacramento, CA 95814

If interested parties wish to maintain the confidentiality of specific data or information, they must submit an application for confidentiality and the confidential documents directly to the Docket Unit through the e-filing system. For information on applying for confidentiality, interested parties should contact the Docket Unit in the CEC's Chief Counsel's Office before submitting a response to this RFI. Otherwise, all responses received will become publicly available. Visit the Docket Unit page which links the application for confidentiality.

Questions regarding submittal of comments to a docket, including inquiries regarding confidentiality, should be referred to the Docket Unit at docket@energy.ca.gov or (916) 654-5076.

Technical Subject and General Inquiries

Email CEC staff at solarequipment@energy.ca.gov. Please include "RFI" in the subject of your email.

Subscriptions

To receive updates and information from the CEC regarding the CEC's Solar Equipment Lists, interested parties should subscribe to the "Solar Equipment" email subscription service. You may also subscribe by visiting the CEC's Subscriptions webpage and choosing Renewable Energy under the individual category of topics.

Availability of Documents

Documents submitted in response to this request for information will be available in the Solar Equipment Lists Program Implementation docket 26-SOLAR-01.

When new information is posted to docket 26-SOLAR-01, an email will be sent to those subscribed to the "Solar Equipment" email subscription service.

Dated: June 10, 2026, at Sacramento, California.

Deana Carrillo

Deana Carrillo
Director

Subscriptions:
Solar Equipment

ATTACHMENT A

Additional items under consideration by CEC staff as potential modifications to the SEL Guidelines

Note: Items not discussed below may be included when CEC staff proposes modifications to the SEL Guidelines later in 2026.

General Updates

1. Rename the Guidelines to "Guidelines for the California Energy Commission's Distributed Energy Resource Equipment List".
2. Clarify that submitting information for the equipment list is not required to comply with Title 20 appliance efficiency standards or to install equipment in California.
3. Clarify that the Guidelines and SEL apply only to grid-connected equipment and systems that discharge energy into the grid (including grid-connected non-export) while operating in parallel to the grid.
4. Remove references to closed incentive programs and equipment types no longer relevant, including removal of the Other Solar Electric Generating Technology (OSEGT) list.
5. Clarify that certificates of compliance must be for the U.S. market and cannot be at the component level (e.g., "recognized component").
6. Clarify that field-certified products will not be accepted for inclusion in the SEL.
7. Clarify that each model number of a product can only have one set of data per equipment type in the SEL.
8. Add Guidelines content for Power Control Systems (PCS).

Photovoltaic (PV) Modules

1. If UL 1703 is withdrawn from active standard status, all modules without a UL 61730-1 and UL 61730-2 certificate of compliance will be archived 12 months after the date of withdrawal.
2. Update referenced test procedures from IEC 61215:2005 to IEC 61215-2:2021 where applicable.
3. Remove optional performance testing per IEC 61853 and optional full type testing per IEC 61215.
4. Reduce manufacturer performance testing burden where reasonable:

a. Eliminate reporting of voltage and current at low irradiance and at Nominal Operating Cell Temperature (NOCT).

b. Clarify that measurement of NOCT, if retained as a requirement, is only required for the darkest color backsheet.

5. Add bifacial yes/no field to PV module list.

Inverters

1. Inverter submittals to the SEL require UL 1741 Supplement B. Submittal of UL 1741 Supplement A documentation no longer allowed.
2. Reduce manufacturer performance testing burden where reasonable:
    a. Inverter power and efficiency testing required only at lowest inverter output voltage instead of all inverter output voltages.
    b. Inverter power and efficiency testing required only at lowest power level for modular inverters.
    c. External transformers must be included in inverter efficiency testing when required for interconnection with utility grid.
3. Update inverter list format:
    a. Merge solar inverter and battery inverter lists into a single inverter list.
    b. Replace hybrid yes/no field with source type yes/no fields (PV, battery, other).
    c. Add grid-forming yes/no field.
    d. Add nominal maximum continuous output power (MCOP) field.

Energy Storage Systems (ESS)

1. Accept only UL 9540 certificates of compliance issued by Nationally Recognized Testing Laboratories (NRTLs) whose Occupational Safety and Health Administration (OSHA) scope of recognition includes UL 9540.
2. Clarify that DC ESS and AC ESS can be submitted to the SEL.
3. AC ESS capable of exporting to the utility grid must comply with UL 1741 Supplement B and provide documentation to the SEL.
4. Battery expansion packs with energy capacity only treated as batteries, not ESS.

5. Added fields for ESS list:
    a. DC or AC ESS field, grid-forming yes/no field, and grid-export capable yes/no field.
    b. Nominal maximum continuous output power field for AC ESS capable of exporting to utility grid.

Batteries

1. Accept only UL 1973 certificates of compliance issued by NRTLs whose OSHA scope of recognition includes UL 1973.
2. Battery expansion packs with energy capacity only treated as batteries, not ESS.

Meters

1. Clarify that DC meters can be submitted to the SEL.

ATTACHMENT B

Equation for Calculating the Photovoltaics for Utility Scale Applications (PVUSA) Test Conditions (PTC) Rating

$$P_{PTC} = P_{STC} * \left[1 + \frac{\gamma_{P_{STC}}}{100} * \left[T_{MOD,CEC} - 25\right]\right] \text{ where}$$

$$T_{MOD,CEC} = 20 + 1.389 * (T_{NOCT} - 20) * \left(0.9 - {}^{\frac{P_{STC}}{1000}}\!/_{A_c}\right)$$

STC = Standard Test Conditions of 1,000 Watts per square meter solar irradiance, 25 degrees Celsius cell temperature, air mass equal to 1.5 (AM1.5), and ASTM G173-03 standard spectrum.

PTC = Photovoltaics for Utility Scale Applications (PVUSA) Test Conditions of 1,000 Watts per square meter solar irradiance, 20 degrees Celsius air temperature, and wind speed of 1 meter per second at 10 meters above ground level.

P_{PTC} = maximum power in Watts at PTC. This is the PTC rating. The CEC calculates the PTC rating using the equation above.

P_{STC} = maximum power in Watts at STC. The CEC uses the manufacturer's nominal value of P_{STC} in the calculation of the PTC rating after validating that the nominal value of P_{STC} is within +/- 5% of a laboratory tested value of P_{STC}.

$\gamma_{P,STC}$= temperature coefficient of maximum power at STC in percent per degree Celsius. The CEC uses a laboratory tested value of the maximum power temperature coefficient in the calculation of the PTC rating.

$T_{MOD,\ CEC}$ = adjusted photovoltaic module temperature historically used by the CEC for photovoltaic rebate and incentive programs. See additional information on the following pages of this attachment.

T_{NOCT} = nominal operating cell temperature (NOCT) in degrees Celsius. The CEC uses a laboratory tested value of the NOCT in the calculation of the PTC rating.

A_C = active cell area of PV module (excluding frame) in square meters. The CEC uses a manufacturer reported value for active cell area in the calculation of the PTC rating.

Derivation of Equation for Adjusted Photovoltaic Module Temperature ($T_{MOD, CEC}$)

Current Standard Approach

Start with a typical steady-state power balance for a module:

$$P_{irradiance} = P_{dissipative} + P_{reflection} + P_{electricity} \quad (1)$$

where

$$P_{irradiance} = Irr \cdot A \quad (2)$$

$$P_{dissipative} = h_c \cdot A \cdot (T_{mod} - T_{amb}) \quad (3)$$

$$P_{reflection} = R \cdot Irr \cdot A \quad (4)$$

$$P_{electricity} = \eta \cdot Irr \cdot A \quad (5)$$

and Irr is irradiance, A is module area, h_c is thermal conductance, R is the fraction of the incident irradiance that is reflected, η is the gross module operating efficiency, T_{mod} is the average cell temperature in the module, and T_{amb} is the ambient air temperature.

Equation 1 can be simplified now:

$$Irr \cdot A = h_c \cdot A \cdot (T_{mod} - T_{amb}) + R \cdot Irr \cdot A + \eta \cdot Irr \cdot A \quad (6)$$

$$1 = \frac{h_c \cdot (T_{mod} - T_{amb})}{Irr} + R + \eta \quad (7)$$

Leading to the following basic relation:

$$T_{mod} = T_{amb} + \frac{Irr \cdot (1 - R - \eta)}{h_c} \quad (8)$$

For the remainder of this discussion, the reflected fraction R will be assumed to be 10%.

The Nominal Operating Cell Temperature (NOCT) is obtained from measurements acquired in Nominal Terrestrial Environment (NTE)[1]. These conditions are 800 W/m^2 incident irradiance, 20 °C ambient temperature, 1 m/s average wind speed, with the module open-circuited and oriented normal to solar noon, back either open or closed.

Given these operating conditions, the composite heat transfer coefficient may be determined using Equation 8:

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[1] NTE conditions are currently described in ASTM E1036-96, Annex A1. They were previously described in LSSA Project Task Report 5101-31, "Thermal Performance Testing and Analysis of Photovoltaic Modules in Natural Sunlight", by Jet Propulsion Laboratory, 1977, Appendix A.

$$h_{c,NOCT} = \frac{800 \cdot (0.9 - 0)}{(NOCT - 20)} \qquad (9)$$

For the CEC rebate rating, PVUSA Test Conditions are assumed. These are 1000 W/m^2 incident irradiance (850 W/m^2 for concentrators), 20C ambient temperature, 1 m/s average wind speed, with the module operating at peak power. The mounting configuration is assumed to be the same as for NTE, except for modules that are not designed to operate in an open rack. For modules with special mounting considerations, the temperature adjustment must include those effects.

Given these operating conditions, Equation 8 gives the expected operating temperature of the module:

$$T_{mod,CEC} = 20 + \frac{1000 \cdot (0.9 - \eta)}{h_{c,CEC}} \qquad (10)$$

Note that the efficiency η under actual operating conditions varies with temperature, so this equation should be solved in an iterative fashion. However, the improvement in accuracy obtained by iterating is not significant, so simply using the efficiency under STC conditions is sufficient. In addition, the uncertainty in *R* is probably a few percent, which is more than the variation in efficiency due to temperature.

Having accounted for the effects of irradiance and conversion efficiency, we would now like to obtain $h_{c,CEC}$. Observing the thermal similarity between the CEC/PTC conditions and the NTE conditions (similar ambient temperature, similar mounting configuration, and similar wind speed conditions), we assume $h_{c,CEC}$=$h_{c,NTE}$.

If modules (such as concentrators) that should not be characterized using NTE are submitted to the list of approved modules, the manufacturer will bear the responsibility for predicting the cell operating temperature.

Therefore, the correct equation in practically all cases will be (combining Equations 9 and 10):

$$T_{mod,CEC} = 20 + 1.389 \cdot (NOCT - 20) \cdot (0.9 - \eta_{STC}) \qquad (11)$$

Ac Modules

We currently only have one module of this type on the list. A similar analysis may be applied to ac modules, and the temperature correction can be applied the ac power.

Original Approach

When PVUSA first drafted a request for data from module manufacturers in January 1998, there were two differences from the current approach. First, a value of "Installed NOCT" (INOCT) was deemed necessary, since some modules would not fit the "open-rack" environment specified by JPL's version of NTE (which PVUSA originally referred to when developing the original "suggested" equation). To be general, we assumed we would apply this requirement to all modules. Second, the efficiency was assumed to be 7% as an approximate number sufficiently accurate for estimating temperature.

The current version of NTE described by ASTM E1036-96 expands the defined mounting configurations to include both open- and closed-back mounting configurations. This supports the characterization of PV "shingles" and other integrated building materials using NOCT. Therefore, the rationale for involving an estimate of INOCT is less than originally thought.

A relation between NOCT and INOCT was outlined in Sandia Report SAND85-0330 (1987), by Martin K. Fuentes. The odd thing about the tabular relation presented in this report was that modules installed in "open-rack" configuration were found to have an INOCT that was 3 °C cooler than NOCT! This result implies that there were differences between the configuration of the tested modules between their NOCT testing and INOCT testing that are not described in the report. However, both the magnitude of the difference and anecdotal evidence by Chuck Whitaker (who was involved in the testing) suggest that the modules were actually operating when the temperature measurements were taken. Thus, we can either include this effect in our analysis (yielding a different relation between the Fuentes INOCT and the CEC temperature rating), or avoid using the Fuentes relation at all. We have chosen the latter option.

The use of 7% as a value for efficiency is liable to be in error by 2-4% in most cases. The effect of a 4% error in efficiency is less than 1% in the estimated power, which is much less than the 5-10% typical variation in output power for each module of a particular model of module. However, since the efficiency is so easy to compute, there is little to be gained by ignoring it.