

Solar America Board for Codes and Standards



Solar ABCs Policy Recommendation: PV MODULE POWER RATING REQUIREMENTS

Prepared by

Govindasamy TamizhMani

Arizona State University
Photovoltaic Reliability Laboratory
(PRL)

Alex Mikonowicz

PowerMark Corporation

Solar ABCs Policy Recommendation:

PV MODULE POWER RATING REQUIREMENTS

Overview

The Solar America Board for Codes and Standards (Solar ABCs) intends to develop recommended policies to address the current consumer and industry concerns related to the use of various photovoltaic (PV) performance, qualification, reliability, and safety standards. The power rating policy is a living document, and its scope is influenced by market requirements and the availability of existing standards. This recommended policy is written in conformity with the performance conditions in IEC 61853-1 standard titled “Photovoltaic (PV) module performance testing and energy rating – Part 1: Irradiance and temperature performance measurements and power rating.”

Policy Recommendation Statement

“It is recommended that photovoltaic module types sold or installed in the United States be independently measured and certified to the following power rating tolerance: after accounting for the light induced degradation¹ as per IEC 61215 (crystalline silicon) or IEC 61646 (thin film), the measured average² power shall be equal to or higher than the nominal nameplate power rating at STC (standard test conditions) and no individual module power shall be more than 3% below nominal. In addition, the modules shall be rated at a minimum at the four other reference conditions given in IEC 61853-1 standard: 200 W/m² & 25°C cell temperature; 500 W/m² & 15°C cell temperature; 1000 W/m² & 75°C cell temperature; 800 W/m² & 20°C ambient temperature.”

Goals:

The goals of this policy statement are to:

- increase customer awareness of the potential for discrepancy between the nameplate rating and performance of delivered PV modules and define a reasonable expectation for the consistency of these numbers;
- increase customer awareness of the power ratings available to them as a result of the IEC 61853-1 standard and empower customers to better compare the performance of modules under a range of conditions;
- improve the willingness of financial institutions to lend money for PV systems and reduce the risk of investments in PV systems by tightening the tolerance on module ratings.

Why the Policy Recommendation is Important

This policy recommendation is important because without a power rating tolerance policy, some PV modules may continue to have a significantly lower power output than the module’s rating indicates. This results in reduced performance of installed PV systems that will not meet consumers’ expectations. If overrating of modules continues, it will jeopardize the credibility of PV performance predictions with the general population and could slow progress toward wide adoption of solar energy technologies. This policy is the same as the existing standard used in Europe (EN 50380) with the addition of a specific lower/upper limit for the production tolerance and removing uncertainty on measured power as it varies from one



lab to the other and from one test/reference technology to the other. In addition, without power rating data at various low/high irradiance and temperature conditions, the energy collection predictions for installed PV modules and systems will not be accurate.

Issues

Most consumers, system integrators, and agencies providing incentives have relied on the module nameplate ratings to estimate the power and/or energy delivered by installed PV systems. Unfortunately, those estimations often have not met expectations. A possible outcome of this common trend of overstating module power ratings may be a loss of consumer and government confidence in the ability of PV modules and systems to perform as expected. It is important to recognize that the credibility of PV technology depends not only on the quality of the PV products, but also on industry practices. The nominal power ratings listed on the nameplates of PV modules were often found by independent test laboratories to be much higher than the actual measured power.

For more information please contact:

Mr. Larry Sherwood, 303-413-8028,
larry@sherwoodassociates.com.

Download the full report:

www.solarabcs.org/powerratingpolicy

About Solar America Board for Codes and Standards

The Solar America Board for Codes and Standards (Solar ABCs) is a collaborative effort among experts to formally gather and prioritize input from the broad spectrum of solar photovoltaic stakeholders including policy makers, manufacturers, installers, and consumers resulting in coordinated recommendations to codes and standards making bodies for existing and new solar technologies. The U.S. Department of Energy funds Solar ABCs as part of its commitment to facilitate widespread adoption of safe, reliable, and cost-effective solar technologies. For more information, visit the Solar ABCs website: www.solarabcs.org

**Solar America Board
for Codes and Standards**

www.solarabcs.org