
Nameplate, Datasheet and Sampling Requirements for PV Modules

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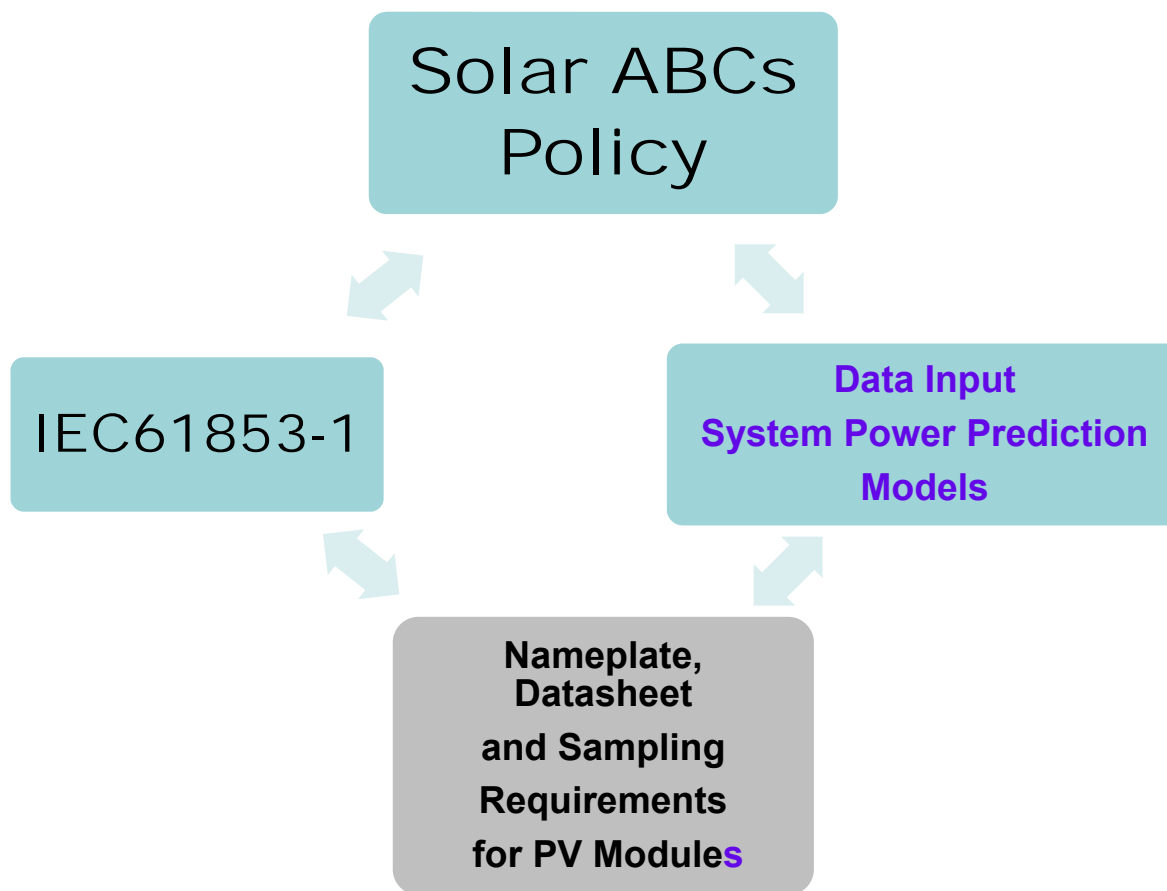
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Policy – Motivation

- Without a power rating tolerance policy, some PV modules may continue to have a **significantly lower power output than the module's rating indicates**.
- 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.



How the Standards & Policy Work Together



Policy - Recommendation (March 2011)

“It is recommended that photovoltaic modules 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 degradation as per IEC 61215 (crystalline silicon) or IEC 61646 (thin film), the measured average 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 minimum four other reference conditions as per 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.”



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Standard - Proposed (IEEE, ASTM or IEC?)

• Overall Requirements

$$P_{\text{measured, average}} \geq P_{\text{rated, nominal}}$$

&

$$P_{\text{measured, individual}} \geq (P_{\text{rated, nominal}} - 3\% \text{ production tolerance})$$

where:

$P_{\text{measured, average}}$ is the measured average power of “n” samples

$P_{\text{measured, individual}}$ is the measured power of “individual” samples



Standard - **Proposed** (IEEE, ASTM or IEC?)

• Nameplate Requirements

- Data at STC: Pmax, Voc, Isc, Vmax, Imax
- Negative production tolerance (-%)

• Datasheet Requirements

- Data at STC: Pmax, Voc, Isc, Vmax, Imax
- Negative production tolerance (-%)
- Power matrix as per IEC 61853-1 (23 test conditions)
- Number of samples (minimum 30?) used to obtain measured average power
- Measured power of all the individual modules
- Calibration traceability (*calibrated sources & methodology at production and test lab*)

• Sampling Procedure

- Independent lab?

OR

- ANSI/ASQ Z1-2003: Responsible Authority? (Agreed to by the purchaser and seller)

Information Slides



IEC 61853-1:
PHOTOVOLTAIC (PV) MODULE PERFORMANCE TESTING AND ENERGY RATING –
Part 1: Irradiance and temperature performance measurements and power rating

<i>P_{max}</i>					
Irradiance (W/m ²)	Spectrum	Module Temperature			
		15°C	25°C	50°C	75°C
1100	AM1.5	NA			
1000	AM1.5				
800	AM1.5				
600	AM1.5				
400	AM1.5				NA
200	AM1.5				NA
100	AM1.5			NA	NA