

## Proposed Changes to California Energy Commission Emerging Renewables Program Guidebook

The Fifth Edition of the California Energy Commission Emerging Renewables Program Guidebook in published in July 2005 incorporated new performance testing and reporting requirements for Eligible Inverters intended to provide qualified data for consumers and a leveled playing field for manufacturers. The two proposed changes below will provide these same benefits for PV module consumers and manufacturers.

### **Proposed Change #1: All PV modules must obtain and maintain PowerMark certification to IEC 61215 or IEC 61646 qualification standards.**

Japan, most European countries, and elsewhere require modules be evaluated to these qualification (i.e., reliability) standards. These standards are based on tests developed in the US starting in the early 1980's. The initial CEC program requirements decided to impose UL 1703 safety standards rather than the available qualification standard because modules listed to 1703 simplified local electrical inspection requirements. It turns out that most modules sold in the US are tested to the appropriate IEC standards, because they are also sold to Germany and other European clients requiring this testing. However, some US-only models are not evaluated or re-evaluated for their specific changes. Lacking such a requirement makes the California and the US a potential dumping ground for substandard modules produced in other countries

The imposition of PowerMark (see [www.powermark.org](http://www.powermark.org)) would simplify the management of the test requirements. With the already imposed safety Listing, the Listing agency (UL, ETL, CSA) verifies that the tests are performed by qualified laboratories, performs periodic inspections, and provides, and ensures on-going compliance. PowerMark is a non-profit, industry-backed agency established specifically to provide this type of certification for PV components and systems. PowerMark has a certification program for verifying qualified laboratories (at least 4 in the US and Europe have already been qualified), performing periodic inspections and ensuring on-going compliance.

#### Advantages:

- 1) Ensure all PV modules are properly tested for reliability according to the appropriate international consensus standards.
- 2) Verify that the test laboratories are qualified
- 3) Cost to implement will be low since most modules have already been tested, and most manufacturer's meet the ISO 9000 series quality program requirements

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**Proposed Change #2: The PV module Nameplate (STC) Power Rating shall represent the minimum output power for that model based on qualified production line measurements and shall include an adjustment for initial light induced degradation. This rating shall also represent the value from which the warranty power tolerance is calculated.**

Currently, modules sold into California are provided with a power rating tolerance of up to  $\pm 10\%$ , meaning that a module with an STC Nameplate Rating of 150 Watts could have an actual rating of between 135W and 165W, based on manufacturer factory testing. Due to market pressure and other circumstances, the actual rating of an individual module rarely meets, let alone exceeds, the nameplate rating, thus measured system performance continues to fall short of expectations. European procurements typically require a tighter tolerance ( $\pm 3\%$ ) than is normally provided in the US, and evidence suggests that California and other US consumers get modules below this 3% tolerance. The suggested change would simply require that the module rating represent the minimum of the tolerance, e.g., 135W in the above example. The manufacturer could provide whatever tolerance band they felt appropriate.

Also, the change would require all technologies to include an adjustment for initial Light Induced Degradation. Such an adjustment has been standard practice with thin film modules that exhibit 5-20% reduction in output power over the first few weeks or months of operation. All PV technologies exhibit some amount of LID, though with crystalline Silicon, for example, the degradation is small (1-3% of initial rated power) and occurs within the first few hours or days of exposure. This suggested change would create a level requirement for all technologies

**Impact:**

- 1) Would improve the actual versus expected performance of most PV systems sold into the ERP.
- 2) Would likely change the ratings for some models
- 3) Manufacturer's already test and bin each module coming off the factory line so there would be no additional testing or administrative requirements
- 4) If the price per module remains unchanged, the price per watt would increase for some products as much as 3% to 10%. However, the price per kWh would remain unchanged.