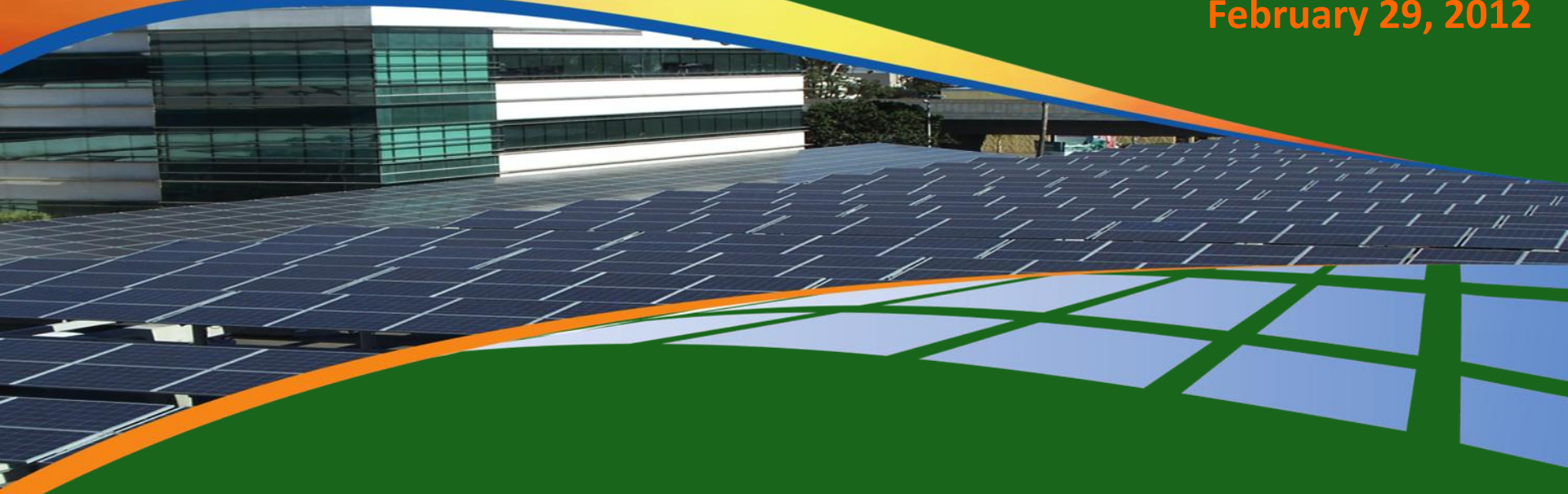


“The Thresher Test” Crystalline Silicon Terrestrial Photovoltaic (PV) Modules Long Term Reliability and Degradation

NREL PV Module Reliability Workshop

February 29, 2012



Certification Services: IEC61215 – IEC61646 – IEC62108 – IEC60904 – IEC61730 – IEC61853 – IEC62688
UL1703 – UL8703 – UL2703 – UL1741

BOS Component Testing: Junction Boxes, Cables, Connectors, Inverters

Outdoor Performance Validation: Energy Yield Validation, Soiling, Degradation and Site Commissioning

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Thresher Test Protocol: Motivations / Objectives

"The Thresher Test Protocol was developed specifically to create a *de facto accelerated testing protocol* which would provide buyers of PV modules with a set of *apples-to-apples long-term reliability data* to use in their PV buying decisions."

The genesis of the TTP was sparked by:

- the absence of established and accepted accelerated test of a module's long term performance and reliability. Therefore, many manufacturers have proprietary testing regimens, and are using their in-house testing to ensure that their products will hold up well overtime (25+ years), as well as to privately test their competitors' modules for internal benchmarking.
- several module manufacturers are spending a considerable amount of time and money on quality, and are not able to monetize that quality given the perceived "commoditization" of the PV module market.
- the desire of sophisticated Project Developers looking to validate this quality (in terms of long-term performance expectations) with *one standardized test protocol* that could be consistently implemented by independent authorities or 3rd Party Labs.
- concerns of Project Developers / Owner-Operators about the dependability of their energy yield models in 10-25 years (the years beyond the IEC61215 testing schema).
- buyers' wish "that there is a *standardized accelerated testing* to much longer cycle times, beyond IEC 61215, to *separate the wheat from the chaff*."

This was an industry joint effort

A critical mass of Manufacturers, 3rd Party Test Labs and NCBs, got together and jointly developed an agreed upon long term reliability and degradation testing protocol that can be implemented by independent testing authorities / laboratories.

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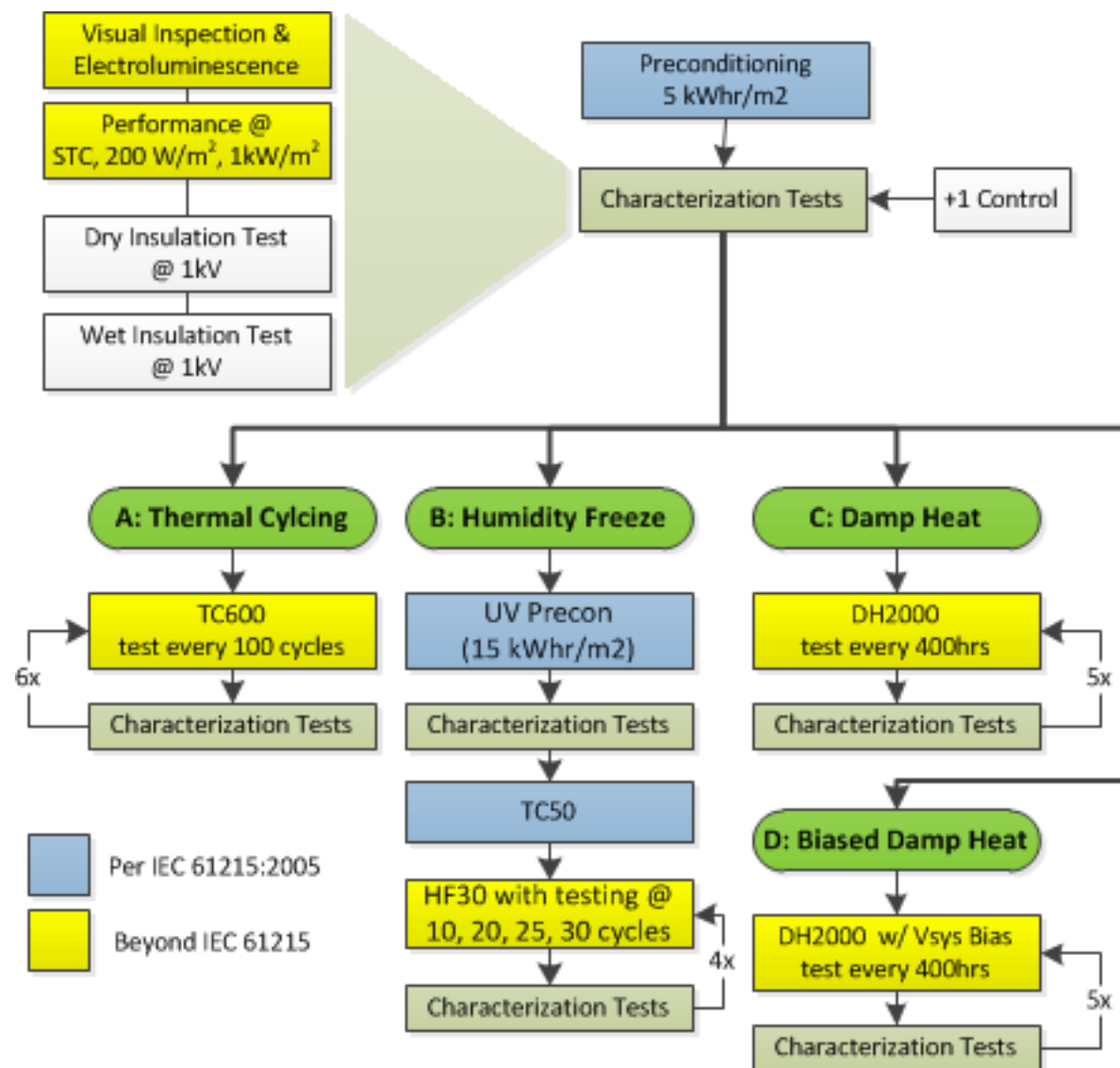
Alelie Funcell, RETC - Program Coordinator

So what is “The Thresher Test” ?

Thresher Test Protocol was derived based on several c-Si PV manufacturers' in-house long term reliability regimens.

It is meant to describe a new long-term reliability test program that will not only help in *differentiating products* but also in *determining the degradation patterns* of different c-Si solar modules.

“Thresher Test for c-Si PV”, intends to *bring long-term performance test data beyond IEC 61215* to the market.



THANK YOU!

“Thresher Test Protocol *separates the wheat from the chaff.*”

➡ **differentiates c-Si PV modules**

➡ **shows products degradation patterns**

➡ **brings long term performance reliability *beyond IEC 61215***

“The Thresher Test” Team

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