Solar ABCs' Policy Recommendation:
Requirement of Qualification Testing in the U.S.

Mani G. TamizhMani
Arizona State University

manit@asu.edu

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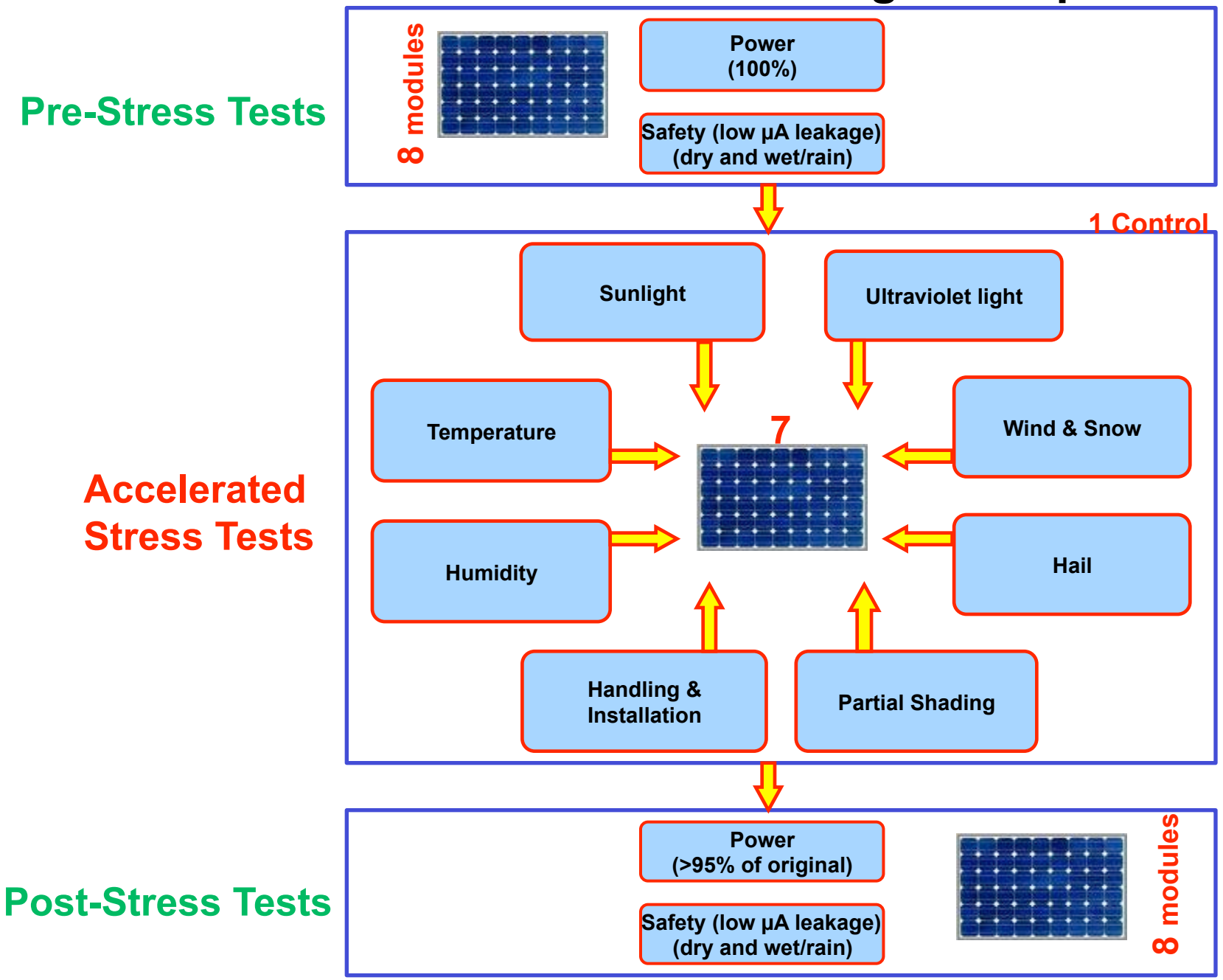
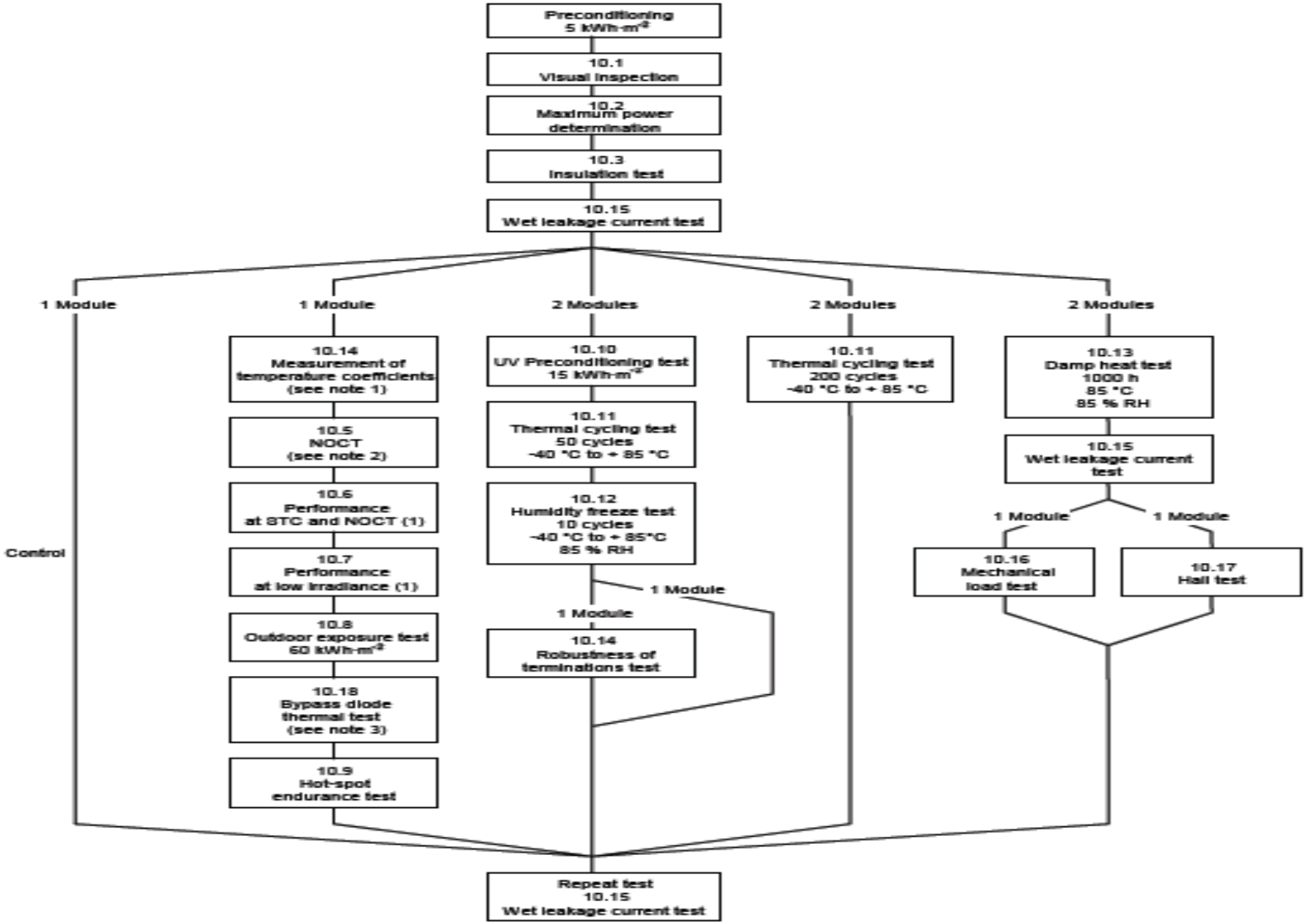
What is module qualification testing?

The qualification testing is a short-duration (typically, 60-90 days) accelerated testing and it may be considered as a minimum requirement to undertake reliability testing or market introduction. The primary goal in the qualification testing is to identify the initial short-term reliability issues in the field.

Qualification Testing Concept

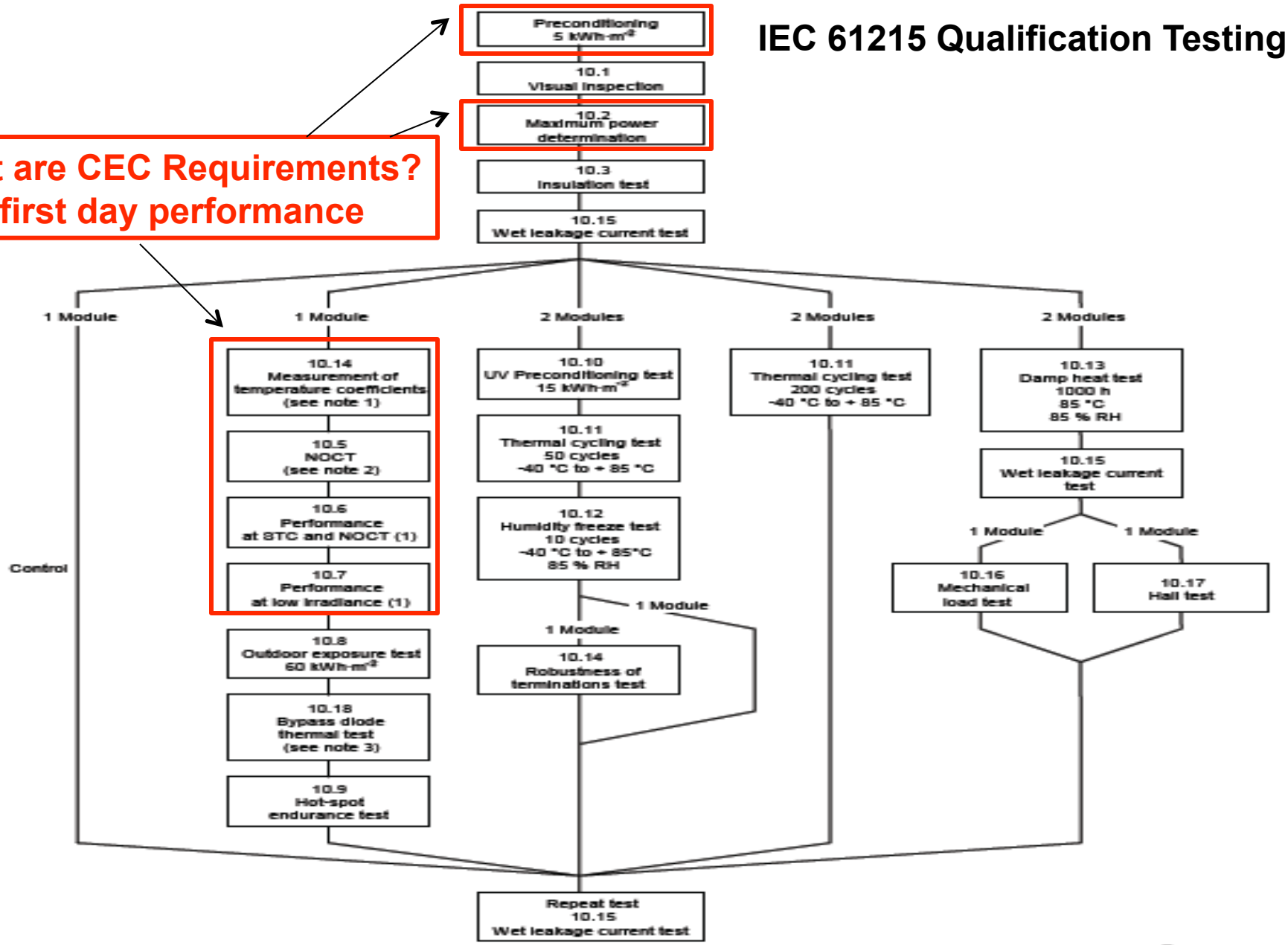


IEC 61215 Qualification Testing



IEC 61215 Qualification Testing

What are CEC Requirements?
Just first day performance

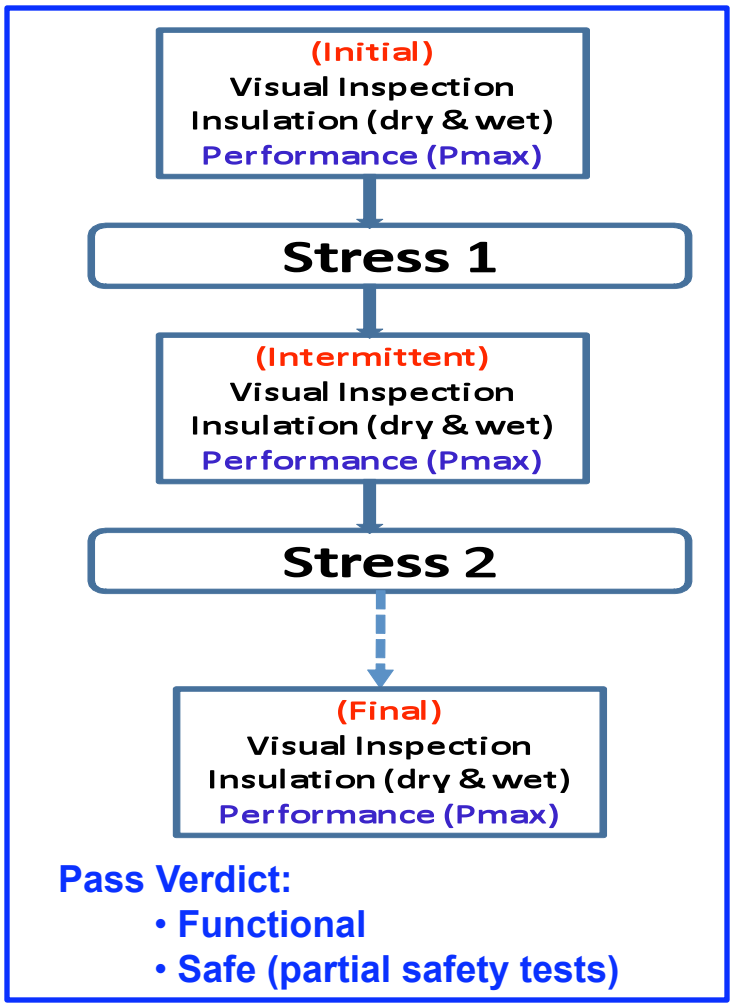


What is the difference between qualification testing and safety testing?

Qualification Standards for PV Modules

- IEC 61215: c-Si
- IEC 61646: Thin-film
- IEC 62108: CPV

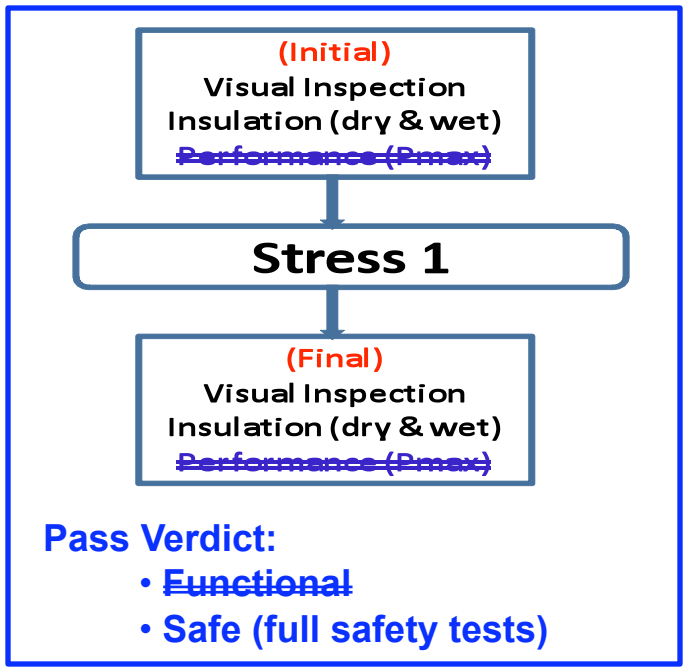
Qualification Testing – Sequential Tests



Safety Standards for PV Modules

- IEC 61730: Both technologies
- ANSI/UL 1703: Both technologies

Safety Testing – Isolated Tests



Why focus on module reliability?

Why focus on PV reliability?

U.S. DEPARTMENT OF ENERGY

1) **Long-term Reliable Performance of Modules & Systems Critical to Cost Parity .**

- More than 20 years required for most components and systems.

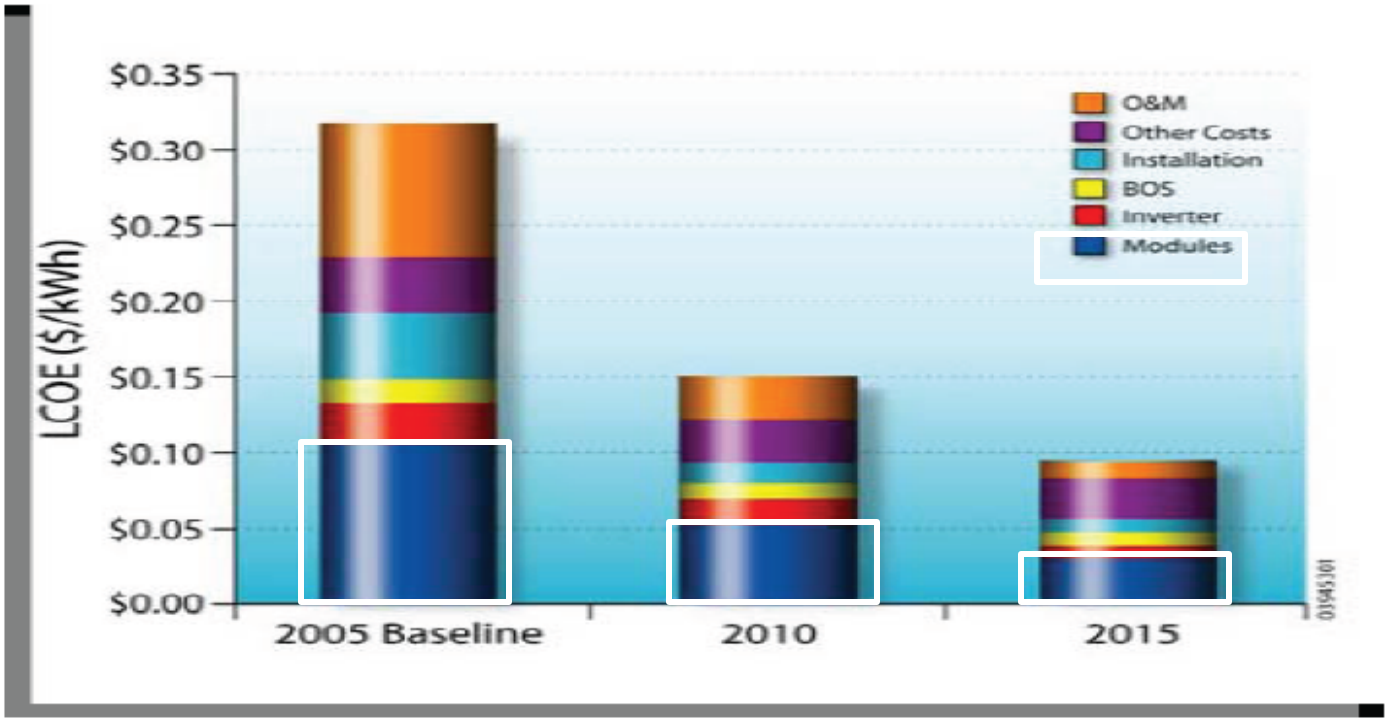


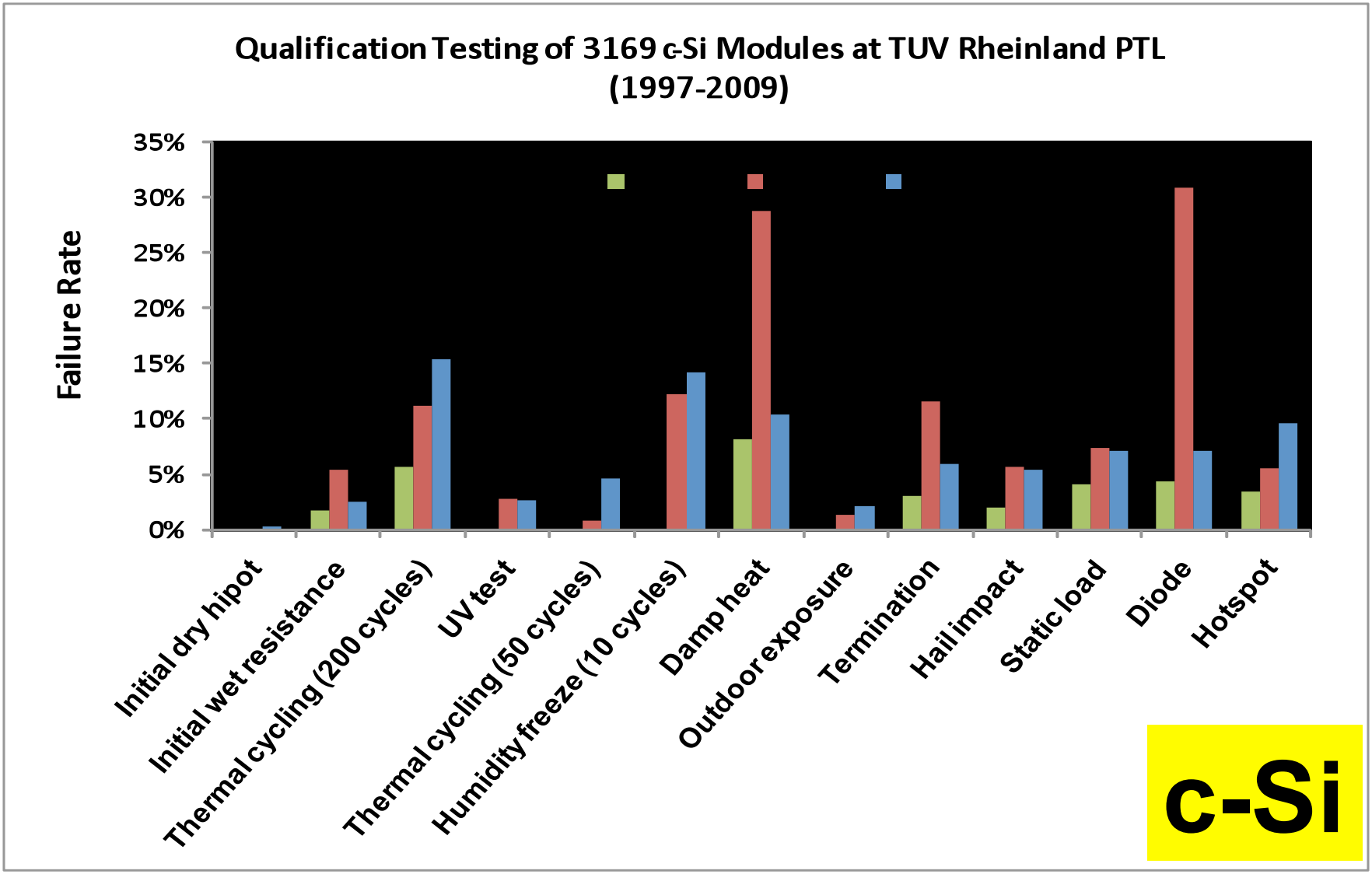
Figure 1: Levelized cost of energy (LCOE) for PV systems indicating more than 1/3rd of the lifetime cost originates from PV modules

(Ref: Sandia National Labs, International Photovoltaic Reliability Workshop, Tempe, Arizona, July 2009)

➢ Qualification Test Results of PV Modules (IEC 61215/1646)

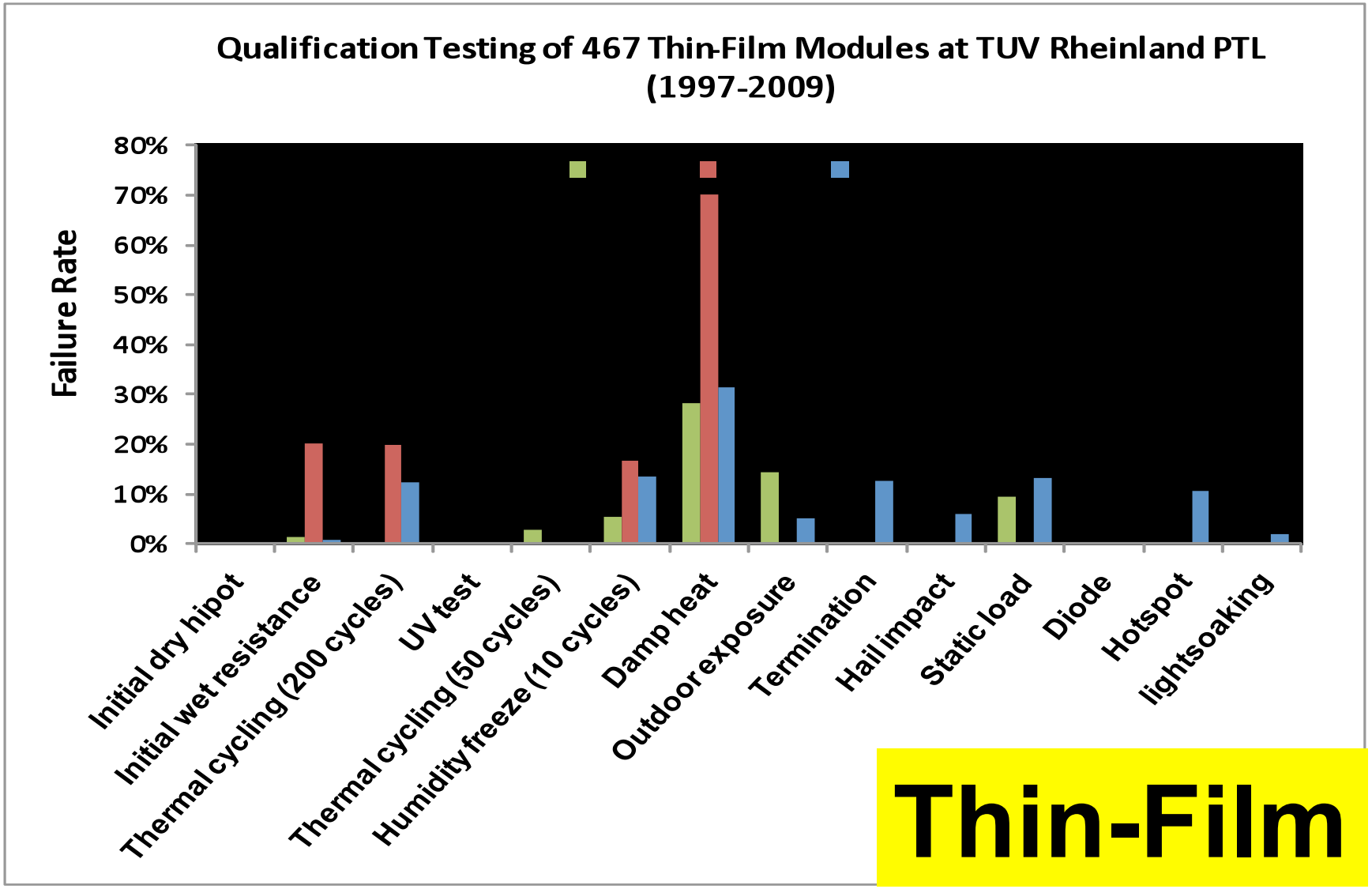
[3636 modules (87% c-Si); 20 different countries; 1997-2009 (13 years of data)]

- **c-Si: 1997-2005 *vs.* 2005-2007 *vs.* 2007-2009**
- **Thin-film: 1997-2005 *vs.* 2005-2007 *vs.* 2007-2009**



Failure Rates of Crystalline Silicon PV Modules in Qualification Testing

(Ref: IEEE Photovoltaic Specialists Conference, Honolulu, June 2010)



Failure Rates of Thin-Film PV Modules in Qualification Testing

(Ref: IEEE Photovoltaic Specialists Conference, Honolulu, June 2010)

Why United States?

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science & technology | solar modules | survey

Survey Evidence:
There are modules certified to UL 1703 (US Safety), but not to IEC 61215 (quality/reliability)

Solar ABCs' Policy:

Solar ABC Policy Recommendations #1 (January 2010) addresses the use of qualification and reliability standards for PV modules:

Policy Recommendation Statement

"Meeting the requirements of qualification standards is considered to be a minimum requirement for any module procurement. Photovoltaic modules sold or installed in the U.S. shall be independently tested and certified to the following qualification standard: IEC 61215 (crystalline silicon flatplate modules), IEC 61646 (thin film flatplate modules) or IEC 62108 (concentrator modules/ assemblies)."

The Solar ABCs web address to get the one-page summary of the policy:

http://www.solarabcs.org/index.php?option=com_content&view=article&id=93&Ite