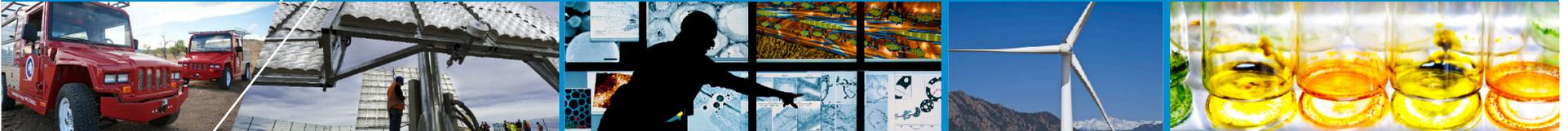


# Overview of PVQAT: Update and Perspectives



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Masaaki Yamamichi, Tony Sample,  
George Kelly, Govind Ramu**

**PV Solar Resource Workshop**

**February 25, 2015**

# Outline

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- **PVQAT: International PV Quality Assurance Task Force – historical perspective**
- **Projects**
  - Climate-specific (use-environment-specific) durability testing
  - Consistency of manufacturing
  - System verification
- **IECRE vs PVQAT; How to become involved**
- **Current status and multiyear targets**
- **Goals for today**

# PVQAT History

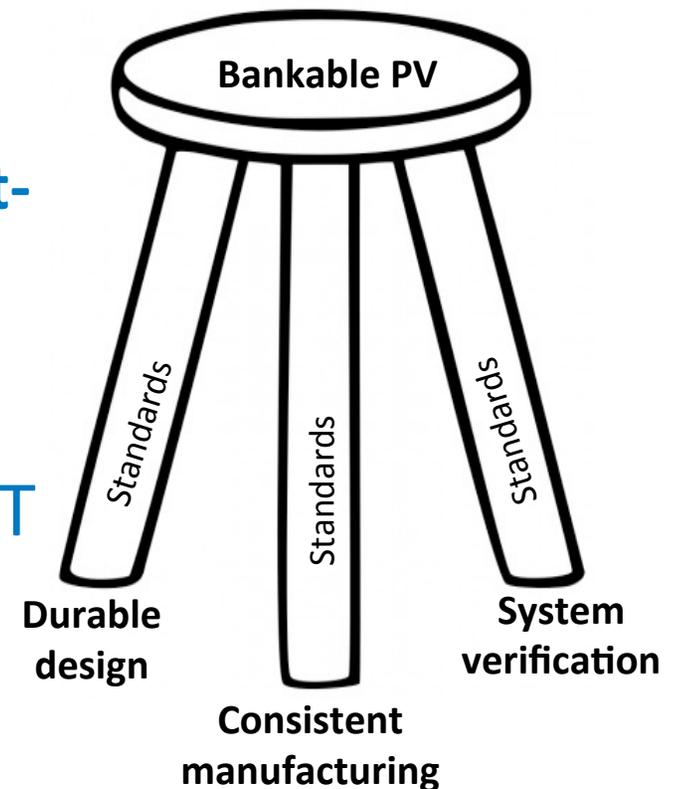
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- **In 2010, when METI was preparing to launch a new incentive program, METI asked DOE to work together to improve PV reliability**
- **AIST and NREL were asked to organize international effort**
- **First international meeting was held in 2011**
- **PVQAT = International PV Quality Assurance Task Force**

# Outline

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- PVQAT: International PV Quality Assurance Task Force
- **Projects**
  1. **Climate-specific (use environment-specific) durability testing**
  2. **Consistency of manufacturing**
  3. **System verification**
- How to become involved in PVQAT
- Current status and multiyear targets
- Goals for today



# 1. Climate-specific durability testing

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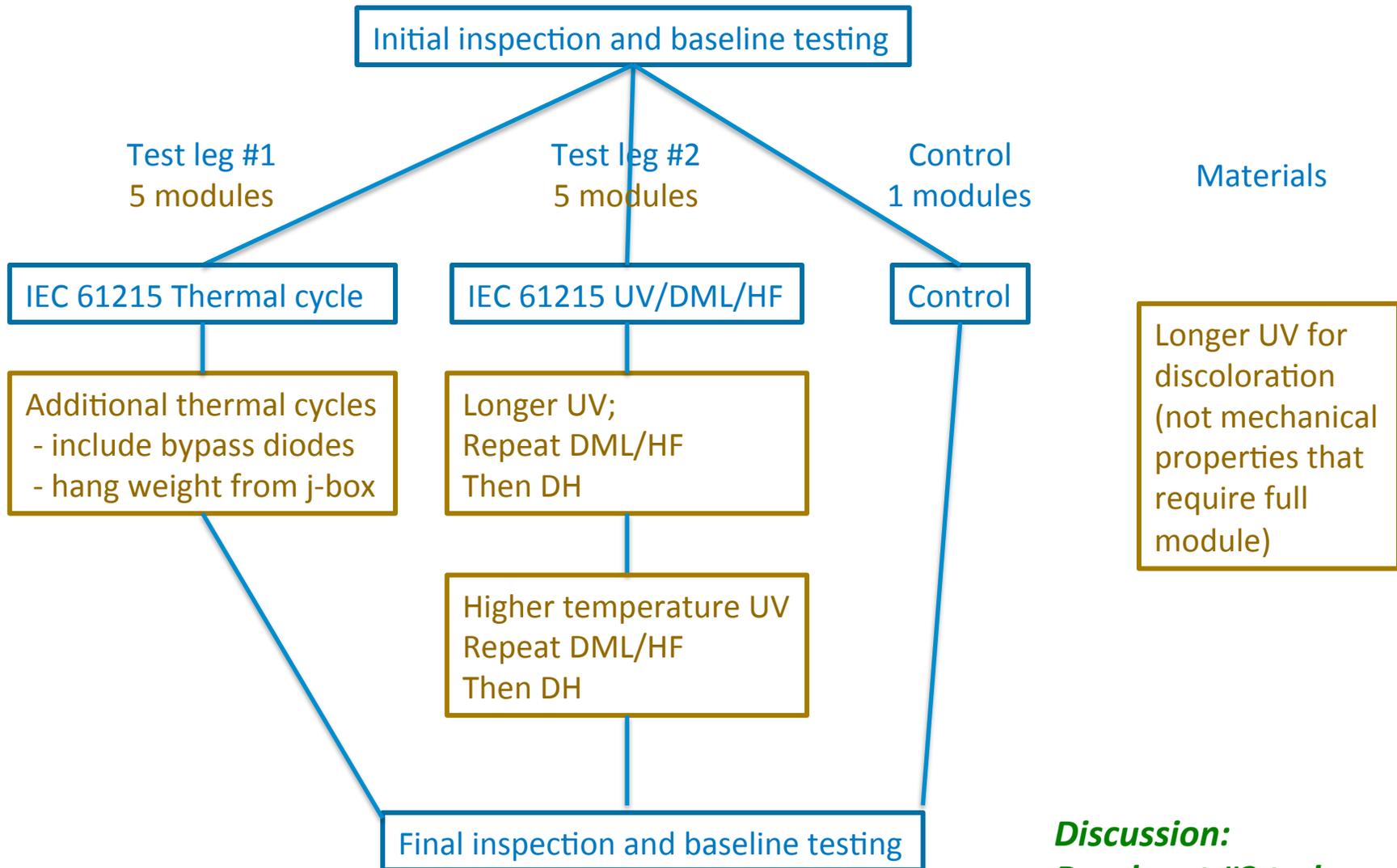
- **Does IEC 61215 test adequately for all use environments? What are the gaps?**
- **Failure mechanisms missed by IEC 61215**
  - Potential-induced degradation
  - Cracked cells
- **Wear-out mechanisms**
- **Use-environment-specific issues**
  - Desert climate (high temperature)
  - Tropical climate (heat and humidity)
  - Close-roof mounting (high temperature)

# 1. Status of climate-specific test

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- **IEC 62892-1 “Testing of PV Modules to Differentiate Performance in Multiple Climates and Applications – Part 1 Requirements for Testing” submitted to IEC as a Committee Draft**
- **Feedback:**
  - Should be “climate-specific” *not* “comparative”
  - Should be designed to be implemented as a follow up to IEC 61215 for easy implementation
- **Still many details to be defined – will be subject of Break out session #2 today**

# 1. Proposed climate-specific test – revised to feedback



## 2. Consistency of manufacturing - status

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- **PV-specific version of ISO 9001 has been proposed to IEC**
- **Feedback: Consistent implementation will be a challenge**
  - Training of auditors
  - Some recommend providing a check list
- **Draft technical specification (DTS) may be submitted to IEC in April; published late '15**
- **Today discuss in Break out #1:**
  - Remaining questions for DTS
  - Next steps

*Discussion:  
Break out #1 today*

# 3. System Verification

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- **Confidence in system requires oversight:**
  - Design
  - Installation
  - Operation
- **Status**
  - IECRE formed as means for implementation
  - National committees are being formed
  - Rules are being written
- **Tomorrow's workshop is dedicated to this**

# IEC and PVQAT

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- **IEC International Electrotechnical Commission**
  - Primary PV international standards organization
  - Formal organization relies on volunteers nominated through formal national committees (providing necessary structure for standards development)
- **PVQAT**
  - Supports IEC
  - Informal organization – anyone can volunteer
  - Brings more energy to research and writing efforts so standards writing can progress more quickly
- **Joint efforts are effective when well coordinated**

# How to become involved in PVQAT

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- Most PVQAT meetings are teleconferences, so it's easy to participate, especially if you don't mind the strange hours!
- Identify which task group interests you: [www.pvqat.org](http://www.pvqat.org) (or [www.pvqat.com](http://www.pvqat.com) for Chinese)
- Contact appropriate task group leader
- Request access to wiki at <http://pvqataskforceqarating.pbworks.com/w/page/42004200/FrontPage> or email [sarah.kurtz@nrel.gov](mailto:sarah.kurtz@nrel.gov)



# International PV Module Quality Assurance Task Force

## PVQAT Multiyear Goals

	IEC Qualification	1. Climate (use)-specific Durability Test	2. Consistent manufacturing	3. IECRE System Verification	Service Life Prediction
<b>2013 status</b>	Issued as standards	Concepts proposed	Initial draft	IECRE proposed	Concepts
<b>2014 status</b>	Submitted Ed 3 61215 Ed 2 61730	Research to understand technical issues	Revised draft submitted	Created System, REMC, and basic rules	Suggest implementation through QMS
<b>2015 goal</b>	Publish new editions; submit amendments	Submit initial drafts for all test legs	<b>Publish specification; Start use</b>	Complete formation of National committees, definition of scope and rules of procedure.	Initial proposal
<b>2016 goal</b>		Revised drafts of all test legs	Revision to reflect feedback	Published procedures; <b>issue first certificates</b>	Revised proposal

# Goals for today

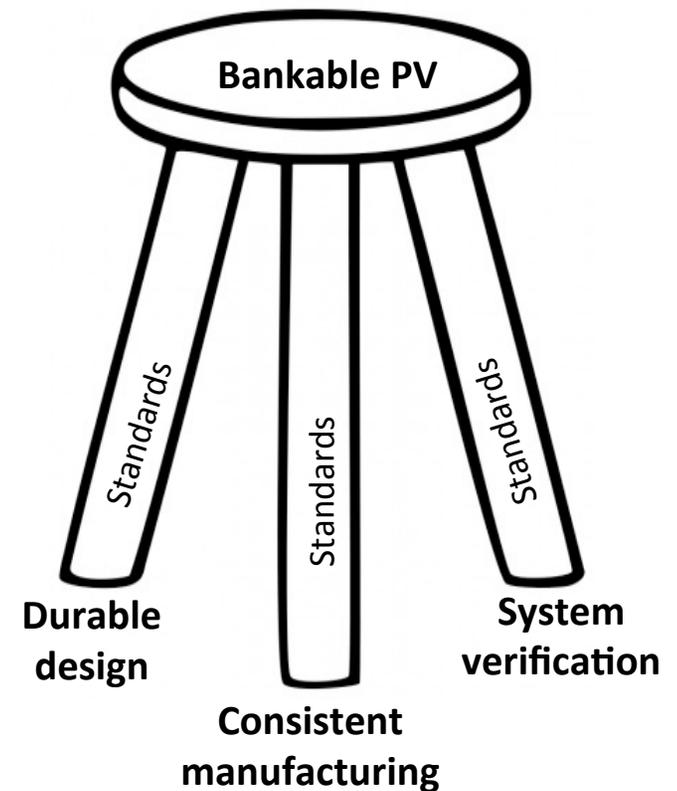
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- **Morning sessions will give background**
- **Break out #1: PV-specific version of ISO 9001**
  - Discuss what is needed for consistent implementation (Training? Checklist?)
  - See background information distributed by email on Saturday, Feb. 21
- **Break out #2: Climate (use) specific test**
  - Discuss sequential approach to implementation
  - Discuss multiple questions

# Conclusions

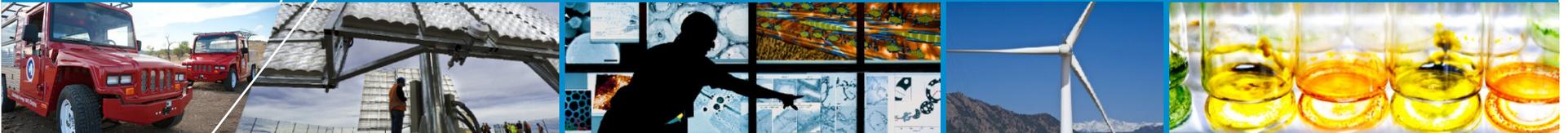
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- PVQAT is working to empower IEC to improve PV standards
- Three primary projects:
  1. Climate-specific (use environment-specific) durability testing
  2. Consistency of manufacturing
  3. System verification
- We welcome your participation today and in the future!



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**Thank you to the dozens  
who have been regularly  
contributing to this work!**