

**Solar America Board for Codes and Standards**

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International Electrotechnical Commission (IEC) is based in  
Geneva, Switzerland

Technical Committee 82

## **SOLAR PHOTOVOLTAIC ENERGY SYSTEMS**

**The secretariat for TC 82 rests in the US. The  
secretary is Howard Barikmo, of Sunset Technology, Inc.,  
who is making this presentation.**

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Standard writing is done through Working Groups:

- ‡ WG 1: Glossary
- ‡ WG 2: Modules, non-concentrating
- ‡ WG 3: Systems
- ‡ WG 6: Balance-of-system components
- ‡ WG 7: Concentrator modules
- ‡ JWG: JCG TC 82/TC 88/TC 21/SC 21A
- ‡ WG 8: Expected Wafer and Cell working group



# IEC TC 82

To find out what we do, go to [www.iec.ch](http://www.iec.ch). Go toward bottom of page and click on **TC Dashboard**. In the TC Dashboard window, type in **82**, then click on **Submit**. That window will give you a menu with 8 options for you to navigate to your heart's content learning the TC 82 mission and its work. Some locations are only open to members of the US Technical Advisory Group of TC 82 (US TAG TC 82).

[Watch out for bald faced commercial coming up later in this presentation!! You've been warned!]



## **IEC TC 82**

# **Working Group 1--Glossary**

The major “workhorse” standards published by TC 82 are  
(by Working Group):

**Hidenori Shimizu, Japan, convenor**

IEC/TS 61836 Solar photovoltaic energy systems –  
Terms and symbols (Ed 3 should be published by  
2011--or early 2012.)



## **IEC TC 82**

# **Working Group 2--Modules non-Concen.**

**Dr. John Wohlgemuth, US, convenor**

IEC 61215 Ed. 2.0 Crystalline silicon terrestrial photovoltaic (PV) modules - Design qualification and type approval. (Ed 3 in process of being written--publish in later 2012 or 2013.)

IEC 61646 Ed. 2.0, Thin-film terrestrial photovoltaic (PV) modules – Design qualification and type approval. (Ed 3 in process of being written.--publish in late 2012 or 2013.)



## IEC TC 82

### Working Group 2--Modules non-Concen.

IEC 61701 Ed 2: Salt mist corrosion testing of photovoltaic (PV) modules **(FDIS--should publish 2012)**

IEC 61730-1 Ed. 1.0, Photovoltaic module safety qualification – Part 1: Requirements for construction.

**(Am 1 publish 2012;Ed. 2 in process of being written.)**

IEC 61730-2 Ed. 1.0, Photovoltaic module safety qualification – Part 2: Requirements for testing. **(Am 1**

**publish 2012; Ed. 2 in process of being written.)**

IEC 61853-1, Power and energy rating of photovoltaic (PV) modules – Power Rating.

**(published Jan 2011)**



## **IEC TC 82**

### **Working Group 2--Modules non-Concen.**

IEC 61853-2, Power and energy rating of photovoltaic (PV) modules – Test Methods.

**(Submitted as CDV--expect to publish mid-2012.)**

IEC 61853-3, Power and energy rating of photovoltaic (PV) modules – Energy Rating. **(Pre-NWIP stage.)**

IEC 62716, Ammonia corrosion testing of photovoltaic (PV) modules **(CD stage--publish late 2012.)**



## IEC TC 82

### Working Group 2--Modules non-Concen.

- PNW 82-654 Ed. 1.0 Photovoltaic devices - Part11:  
Measurement of initial light-induced degradation of  
crystalline silicon solar cells and photovoltaic modules  
(NWIP closed-needs one more volunteer country to make  
it viable)
- PNW 82-655 Ed. 1.0 Cross-linking degree test method for  
Ethylene-Vinyl Acetate applied in photovoltaic modules -  
Differential Scanning Calorimetry (DSC) (NWIP closed-  
needs one more volunteer country to make it viable)





## IEC TC 82

### Working Group 2--Modules non-Concen.

PNW 82-665 Ed. 1.0 Future IEC 6XXXX-1-2: Measurement procedures for materials used in photovoltaic modules - Part 1-2: Encapsulants - Measurement of volume resistivity of photovoltaic encapsulation and backsheet materials **(Closes Dec 2011)**

PNW 82-666 Ed. 1.0 Future IEC 6XXXX-1-4: Measurement procedures for materials used in Photovoltaic Modules - Part 1-4: Encapsulants - Measurement of optical transmittance and calculation of the solar-weighted photon transmittance, yellowness index, and UV cut-off frequency **(Closes Dec 2011)**



## **IEC TC 82**

# **Working Group 2--Modules non-Concen.**

PNW 82-668 Ed. 1.0 Future IEC 6XXXX-1-3 Ed.1: Measurement procedures for material used in photovoltaic modules - Part 1-3: Encapsulants - Measurement of dielectric strength **(Closes Dec 2011)**

PNW 82-669 Ed. 1.0 Future IEC 6XXXX-1-5 Ed.1: Measurement procedures for materials used in photovoltaic modules - Part 1-5: Encapsulants - Measurement of change in linear dimensions of sheet encapsulation material under thermal conditions **(Closes Dec 2011)**



## IEC TC 82

### Working Group 2--Modules non-Concen.

PNW 82-674 Ed. 1.0 Junction boxes for photovoltaic modules - Safety requirements **(Closes Dec 2011)**

PNW 82-675 Ed. 1.0 Connectors for DC-application in photovoltaic systems - Safety requirements and tests. **In collaboration with WG 6 (Closes Dec 2011)**

PNW 82-676 Ed. 1.0 Dynamic mechanical load testing for photovoltaic (PV) modules **(Closes Dec 2011)**

There are many more NWIPs to be presented in the areas of Back Sheets & Front Sheets; Adhesives; Potants and Edge Seals--plus one for PV cables, which may be fielded by WG 6.



## **IEC TC 82**

# **Working Group 3--Systems**

**Ted Spooner, Australia and Martin Cotterell, UK**  
**convenors**

IEC 61829 Ed.1 Crystalline silicon photovoltaic (PV) array  
- On-site measurement of I-V characteristics **(Ed. 2 being  
written--expect to publish mid-2013.)**

IEC 62093 Ed. 1 Balance-of-system components for  
photovoltaic systems - Design qualification natural  
environments **(Coming up for maintenance 2011)**

IEC 62446 Ed.1: Grid connected PV systems - Minimum  
system documentation, commissioning tests and  
inspection requirements.



## **IEC TC 82**

# **Working Group 3--Systems**

IEC 62253 Ed. 1.0, Equipment and safety specifications for direct coupled photovoltaic (PV) – pumping systems. **(Published.)**

IEC 62548 Installation and Safety Requirements for Photovoltaic (PV) Arrays. **(Issued as CDV; expect to publish mid-2012.)**

IEC 62748 TS, PV on Buildings **(Issued as NWIP; expect CD by Dec 2011; publish late 2012) Was also known as BIPV at one time.**



## **IEC TC 82**

# **Working Group 6--Balance of Systems**

**Greg Ball, US and Dr. Vicente Salas, ES, co-convenors**

IEC 62109-1 Safety of power converters for use in photovoltaic power systems - Part 1: General requirements

IEC 62109-2 Safety of power converters for use in photovoltaic power systems - Part 2: Particular requirements for inverters (**Published**)

IEC 62509 Ed.1: Battery charge controllers for photovoltaic systems - Performance and functioning (**Published**)



## **IEC TC 82**

### **Working Group 6--Balance of Systems**

IEC 62109-3 Safety of power converters for use in photovoltaic power systems - Part 3: PV Modules with Integrated Electronic Devices **(In pre-NWIP stage)**

IEC 62109-4 Safety of power converters for use in photovoltaic power systems - Part 4: Particular requirements for combiner box **(CD by mid-2012)**

IEC 62116 Test procedure of islanding prevention measures for utility-interconnected photovoltaic inverters



## **IEC TC 82**

### **Working Group 6--Balance of Systems**

IEC 62109-3 Safety of power converters for use in photovoltaic power systems - Part 3: PV Modules with Integrated Electronic Devices (In pre-NWIP stage) Referred to previously as AC modules





## **IEC TC 82**

# **Working Group 7-- Concentrator Modules**

**Dr. Robert McConnell, US, convenor**

IEC 62108 Ed. 1 Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval **(Being considered for up-date to Ed. 2)**

IEC 62670-1 Ed. 1 Concentrator photovoltaic (CPV) module and assembly performance testing and energy rating - Part 1: Performance measurements and power rating - Irradiance and temperature **(CD; expect CDV by Dec 2011)**



## **IEC TC 82**

### **Working Group 7-- Concentrator Modules**

IEC 62670-2 Ed. 1.0 Concentrator photovoltaic (CPV) module and assembly performance testing and energy rating - Part 2: Energy rating by measurement (**NP; expect CD by Dec 2011**)

IEC 62688 Ed. 1.0 Concentrator photovoltaic (CPV) module and assembly safety qualification (**CD; expect CDV by Dec 2011**)

IEC/TS 62727 Ed. 1.0 Specification for solar trackers used for photovoltaic systems (**Draft TS; expect publication Jan 2012**)



## **IEC TC 82**

# **Working Group 7-- Concentrator Modules**

PNW/TS 82-652 Ed. 1.0 Specification for concentrator cell description **(NP has been approved; expect CD to be out by July 2012)**

PNW 82-673 Ed. 1.0 Concentrator photovoltaic (CPV) solar cells and cell-on-carrier (COC) assemblies - Reliability qualification **(Closes Feb 2012)**



## **IEC TC 82**

### **JCWG: JCG TC 82/TC 88/TC 21/SC 21A**

The JCWG is responsible for writing technical specifications aimed at Decentralized Rural Electrification (DRE) in developing countries. TSs include PV systems but also hybrid and microgrid systems.

These Technical Specifications are in the 62257 series--and are not listed here. To see a listing go to the [www.iec.ch](http://www.iec.ch) website as listed in the 4th slide and search for 62257.



## IEC TC 82 Bald faced commercial

All work in TC 82 in the US is through the US Technical Advisory Group. Experts from the TAG *may* be appointed to various working groups--all dependent on the convenor and not making the WG seem US-centric or European-centric or Asian-centric—and whether you can afford the time and travel to the WG meeting locations.



## **IEC TC 82**

# **Bald faced commercial--continued**

If you'd like to participate, do so as a member of the US TC82 TAG. At least help us to review the draft standards that interest you. Get with Alex Mikonowicz—or me—for more detailed information.

ANSI dues for US TAG members is \$295 per year. Must be a member of ANSI to participate in the Technical Advisory Group.