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**2nd European American
Solar Deployment Conference**

PV Rollout

**Omni Parker House, Boston, USA
February 09th/10th, 2012**



www.pvrollout.us



www.otti.us

Conference Location



Boston offers a wonderful blend of stylish sophistication and historic New England charm. You can easily uncover the city's past while enjoying its modern edge.

Conference Venue:
Omni Parker House Hotel
60 School Street
Boston, MA 02108, USA

Chairman



Prof. Eicke Weber

Fraunhofer ISE, Freiburg, Germany

Eicke Weber is director of the Fraunhofer Institute for Solar Energy Systems ISE and Professor of Physics and Applied Sciences at the Albert-Ludwig University of Freiburg, Germany. From 1983-2006 he was on the faculty of the Department of Materials Science and Engineering of the University of California, Berkeley, and was a Professor of Materials Science beginning in 1991. Dr. Weber is a leading expert in the field of photovoltaic energy

conversion. Recently he studied specifically how well solar cells may be produced from upgraded metallurgical ("dirty") silicon. He is a co-founder of CaliSolar in Sunnyvale, CA, Berlin, Germany and Ontario, Canada, which sells 16% efficiency solar cells based on its own umg-Si.

Co-Chairman



Juris Kalejs PhD

American Capital Energy, North Chelmsford, MA, USA

Juris Kalejs is Chief Technology Officer of the US Solar PV systems integrator American Capital Energy, specializing in large commercial and utility-scale PV installations. Dr. Kalejs co-founded the company with two partners five years ago. He has held various positions in R&D and management during his 35 years in the photovoltaic industry. His scientific work has concentrated on development and commercialization of silicon ribbon technology for photovoltaic applications, and this has led to over 100 publications and a number of patents. He has served on the organizing committees of the IEEE PVSC as well as other national and international conferences and workshops. He has been a member of the US Photovoltaic Roadmap Committee.

Advisory Council

Prof. Travis Bradford

President Prometheus Institute, Chicago, IL, USA and Adjunct Professor of Entrepreneurship and Renewable Energy, Booth School of Business, University of Chicago, IL, USA

Nolan Browne

Managing Director Fraunhofer Center for Sustainable Energy Systems CSE, Cambridge, MA, USA

Craig Cornelius

Managing Director Hudson Clean Energy, Teaneck, NY, USA

Charles Hanley

Manager Photovoltaics and Distributed Systems Integration, Sandia National Laboratories, Albuquerque, NM, USA

Dr. Winfried Hoffmann

Vice President EPIA, Brussels, Belgium

Thomas S. Key

The Electric Power Research Institute EPRI, Knoxville, TN, USA

Ryne P. Raffaele

Vice President for Research and Associate Provost Rochester Institute of Technology, Rochester, NY, USA

Tom Surek, PhD

Surek PV Consulting, Denver, USA

Martha Symko Davies, PhD

Solar Business Manager-PDIL/Incubator, NREL, Golden, CO, USA

Dr. Harry Wirth

Director Division Photovoltaic Modules, Systems and Reliability Fraunhofer ISE Freiburg, Germany

Perspectives

- Financing/Costs
- Project Development
- Electrical Standards/Structural Requirements
- Sunshot Initiative

Topics

- PV Markets
- Modules
- Power Conditioning
- Grid Integration
- PV Power Plants
- Concentrating Photovoltaics (CPV)
- Risk Management and Yield Protection
- Financing of large PV-Systems

Conference Goals

- You will receive comprehensive information about the state of technology as well as the latest results from research and development.
- The scope of the conference is intended to encourage an open discussion of applications and practical experience in Solar Deployment.
- Speakers will be leading experts in the science, technology and business aspects of the solar industry
- The program structure and the conference venue will ensure intensive experience-sharing between participants, presenters and exhibitors.

The market growth for photovoltaic (PV) devices in the last five years has been phenomenal: In 2010 alone, the total globally installed capacity has almost doubled, to a total now of more than 35 Gigawatt of installed power, creating the annual electricity output of five nuclear power plants. The sector is currently valued at more than \$ 50 billion per year. Rapid decrease in cost and increase in efficiency will further fuel this development towards the widespread, silent, harvesting of free sunshine for electricity production by semiconductor technology.

Germany has been the major driver of this development by offering preferential feed-in opportunities of PV power at guaranteed feed-in rates for uncapped quantities of electricity. Currently, the US market finally is beginning its long-anticipated growth. Recent extensions and revisions of the 30% Federal Investment Tax credit make investment into PV more attractive for both investors and system owners. Additionally, more regions of the US are debating and passing legislation to broaden incentives at both the State and city levels and to create favorable investment conditions. The US SunShot Initiative announced in 2011 to bring down installed costs of PV to \$1/Wp represents an ambitious effort to accelerate installed PV price declines. We address both components of this Initiative in our program: the cost of modules and of the Balance of Systems.

These factors are enabling PV to become competitive and profitable, leading us towards a major PV deployment in America. The technology promises to significantly impact how electric power is generated in the United States, in addition to providing an important economic boost to the US manufacturing sector. A more critical aspect of wide PV deployment in the future under discussion will be US energy security.

The first PV Roll-out meeting, a European-American Solar Deployment Conference, took place in February 2011 in Boston. It was a great success: more than 100 delegates enjoyed the opportunity to discuss, with distinguished speakers from the US, Germany and other countries, technology issues of PV deployment, market support policies and market introduction obstacles. The satisfaction rate of the participants was greater than 90%.

The second PV Rollout workshop will give an opportunity to update the discussion of technical, economic, and political hurdles to rapid and widespread PV deployment in the US. Conference speakers will address additionally new trends in module design and balance of system components in the PV supply chain.

We invite you to participate in our conference and to join in the growing excitement about PV. Hear from developers of new PV concepts and from system integrators who implement these concepts to drive innovation and cost reduction. Due to different levels of PV deployment between Europe and the US, this transatlantic conference will leverage the European experience to accelerate PV deployment here. Experts active in the European market will be presenting and will be available to network with guests interested in tapping into their experience. At the same time, this conference will consider the distinctive aspects of the North American markets to ensure that the correct solutions are found for different areas.

We are looking for you – the experts in the field of PV from both sides of the Atlantic!

Prof. Eicke Weber, Fraunhofer ISE, Freiburg, Germany
Juris Kalejs PhD, American Capital Energy, North Chelmsford, MA, USA

You will meet

- Solar Developers
- Independent Power Producers
- Utilities
- Project Developers
- System Integrators
- PV-Suppliers and Consultants
- Inspection and Certification Experts
- Module Manufacturers
- Module Equipment Suppliers
- Policy Makers
- Architects
- Lawyers
- Banks
- Investors
- Insurance Firms
- University Representatives
- Researchers

2nd PV Rollout Conference Workshop – 2012

PV MODULE TESTING BEYOND IEC AND UL

Omni Parker House, Boston, USA - February 08th, 2012, 14:00 – 17:30 hrs

PV modules are supposed to convert sunlight in electricity for more than 25 years all over the world in every climate. Manufacturers give a performance guarantee for this time and more for their PV modules. The current IEC and UL standards are a very coarse grid to sort out the worst products by detecting the early infant failures. The standards are not defined to test the long time durability of PV modules. At the moment no one is able to predict by any test the life time of PV modules. But we are able to define comparative tests to allow a ranking of different products.

In this workshop we will give a brief overview on the current standards (IEC, UL), show results of latest R&D projects and present our PV durability initiative programme.

Speaker:

Claudio Ferrara, Head of Department Weathering and Reliability Head of TestLab PV Modules, Division Photovoltaic Modules, Systems and Reliability, Fraunhofer ISE, Freiburg, Germany

Christian Höpfner, Director of Technical Operations, Fraunhofer CSE, Boston, USA

Martin Plass, Senior Vice President & General Manager, CFV Solar Test Laboratory, Inc., Albuquerque, USA

Workshop Fee

Per Person \$ 160,00

Online Registration at www.pvrollout.us

Program

Thursday, February 9th, 2012

08.00 Registration and Continental Breakfast

OPENING SESSION

Chair: Eicke Weber, Conference Chairman, Fraunhofer ISE, Freiburg, Germany

09.00 **Opening Address**

Gabriele Struthoff-Müller, OTTI, Regensburg, Germany
Eicke Weber, Conference Chairman, Fraunhofer ISE, Freiburg, Germany
Juris Kalejs, Conference Co-Chairman, American Capital Energy, North Chelmsford, USA

09.25 **Welcome Speeches**

Benno Bunse, German American Chamber of Commerce, Inc., New York, USA
Rhone Resch, SEIA, USA (tbc)
Winfried Hoffmann, Vice President EPIA, Brussels, Belgium

09.40 **Key Plenary Opening Talk: Sunshot Initiative USA**
Ramamoorthy Ramesh, Department of Energy, USA

PV MARKETS

Chair: Winfried Hoffmann, Vice President EPIA, Brussels, Belgium

- 10.00 **Global Solar Market Development: 2000 through 2015, A Supply and Demand Perspective**
Paula Mints, Palo Alto, USA
- 10.15 **Insights on the Topic of Grid Parity and its Implications**
Daniela Schreiber, EuPD Research, Bonn, Germany
- 10.30 **Impact of a Rapidly Changing Global PV Market on the Global PV Manufacturing Supply Chain**
Bettina Weiss, SEMI Global Headquarters, San José, USA
- 10.45 **Forecasting Solar in an Era of Declining Subsidies**
Matt Feinstein, LUX Research, Boston, USA
- 11.00 **Discussion**
- 11.20 **Coffee Break**

MODULES

**Chair: Tom Surek, Surek PV Consulting, USA
Nolan Browne, Fraunhofer CSE, Cambridge, USA**

- 12.00 **Closing the Gap between Laboratory Cells and Modules**
Martha Symko-Davies, NREL, USA
- 12.15 **What can we learn from Testing and Certification?**
Claudio Ferrara, Fraunhofer ISE, Freiburg, Germany
- 12.30 **OEM-related Cost Reduction in PV Manufacturing**
Andreas Liebheit, Hanwha SolarOne, Ismaning, Germany
- 12.45 **PV Durability Initiative -
A new Program for Quantitative Assessment of PV Module Durability**
Christian Höpfner, Fraunhofer CSE, Boston, USA
- 13.00 **Discussion**
- 13.20 **Lunch**

POWER CONDITIONING

**Chair: Charles Hanley, Sandia National Laboratories, Albuquerque, USA
Olivier Stalter, Fraunhofer ISE, Freiburg, Germany**

- 14.45 **Interfacing Grids and Renewables Through Power Electronics**
Leo Casey, Satcon Technology Corporation, USA
- 15.00 **N.N.**
- 15.15 **Achieving Smart Energy through a Smart Grid, Smart Premises and Smart Inverters**
Steve Steffel, Pepco Holdings, Inc., USA
- 15.30 **Impact of Silicon Carbide Power Transistors on PV Inverters Today and in the Future**
Jeffrey B. Casady, SemiSouth Laboratories, Inc., USA
- 15.45 **Discussion**
- 16.05 **Coffee Break**

GRID INTEGRATION

Chair: Juris Kalejs, Conference Co-Chairman, American Capital Energy, North Chelmsford, USA

- 16.45 **Grid Integration of Distributed Photovoltaics (DPV)**
Tom Key, The Electric Power Research Institute (EPRI), Knoxville, USA
- 17.00 **N.N.**
- 17.15 **Integration of Photovoltaic Systems into Distribution Networks**
Thomas Degner, Fraunhofer IWES, Kassel, Germany
- 17.30 **N.N.**
- 17.45 **Ancillary Services of the Solar Inverter for more PV in the Grid**
Bernd Engel, SMA Solar Technology AG, Niestetal, Germany
- 18.00 **Grid Stability and Grid Control with PV inverters:
Grid Codes, Requirements and the Capability of Power Electronics**
Sönke Rogalla, Fraunhofer ISE, Freiburg, Germany
- 18.15 **Discussion**
- 18.30 **End of the first Conference Day**

POSTER SESSION

Chair: Martha Symko-Davies, NREL, USA

- 18.40 **Comparative Analysis of the Spanish PV Market in the European context**
Felipe Diaz, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain
Description and Assessment of a Small Scale PV- Fuel Cell System
Fabian Deniz, Universidad de Las Palmas de Gran Canaria, Las Palmas de Gran Canaria, Spain
A Blueprint for High Micro Inverter Reliability
Mark Turner, Enecsys, Redwood Shores, USA
New Innovative Cable Driven Low Profile Solar Tracking System
Klaus Pless, TecnoSun Solar USA Inc., Toledo, Ohio, USA
Presentation of the Sponsors
- 19.00 **Welcome Reception and Conference Dinner**

Friday, February 10th, 2012

- 07.30 **Continental Breakfast**

PV-POWER PLANTS

**Chair: Tom Key, The Electric Power Research Institute (EPRI), Knoxville, USA
Sönke Rogalla, Fraunhofer ISE, Freiburg, Germany**

- 08.30 **Quality Assurance of Large-Scale, Commercial PV Power Plants**
Nils Reich, Fraunhofer ISE, Freiburg, Germany
- 08.45 **Availability for PV Power Plants: is it a useful metric?**
Tassos Golnas, Belmont, Sun Edison, USA
- 09.00 **Calculation of PV-Power Plants' Electrical Characteristics according to Grid Code Compliance**
Frederik Kalverkamp, Zertifizierungsstelle der FGH, Aachen, Germany
- 09.15 **N. N.**
- 09.30 **Discussion**
- 09.50 **Coffee Break**

CONCENTRATING PHOTOVOLTAICS (CPV)

Chair: Vahan Garboushian, Amonix, USA

- 10.30 CPV Demonstration at the Solar Technology Acceleration Center: Background, Status and Developments
Nadav Enbar, EPRI, Boulder, CO, USA
- 10.40 Certification Testing of CPV Modules
Martin Plass, CFV Solar Test Laboratory, Inc., Albuquerque, USA
- 10.50 CPV - Commercial Breakthrough
Clark Crawford, Soitec Solar, Inc., La Jolla, USA
- 11.05 Vahan Garboushian, Amonix, USA
- 11.20 Discussion
- 11.40 Lunch

RISK MANAGEMENT, YIELD PROTECTION AND FINANCING

Chair: David Williams, Clean Path Ventures, San Francisco, USA (tbc)

- 13.15 Sandia's Photovoltaics Reliability Performance Model (PV-RPM)
Jennifer Granata and Joshua Stein, SANDIA, Albuquerque, USA
- 13.30 Risk Management in PV Mounting System Design
John van Winkle, Schletter Inc., Tucson, USA
- 13.45 Review of Utility Solar Business Models
Nadav Enbar, EPRI, Boulder, CO, USA
- 14.00 Mounting System Impact on Risk Management of Solar PV Arrays on Commercial Buildings
Mark Gies, PanelClaw, Inc., North Andover, USA
- 14.15 SREC Impact on Utility-Scale PV in Massachusetts
Bill Fitzpatrick, American Capital Energy, North Chelmsford, USA
- 14.30 N. N.
- 14.45 Discussion
- 15.15 Closing Remarks
Eicke Weber, Conference Chairman, Fraunhofer ISE, Freiburg, Germany
Juris Kalejs, Conference Co-Chairman, American Capital Energy, North Chelmsford, USA
- 15.30 End of the Conference

Legal notice:

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Conditions of Participation and Cancellation:

You will receive a e-mail confirming your participation in the conference. Entrance to the conference will only be permitted if OTTI has received payment. OTTI reserves the right to make modifications and amendments of any kind for urgent reasons. A handling fee of \$200 will be assessed for cancellations received on or before February 2, 2012. All cancellations after February 2, 2012 or absenteeism will be charged the full conference fee. Cancellation requests must be made in writing and can be emailed to Jennifer@agrimeetings.com. Substitutions are permitted up until February 2, 2012.

Organization Committee

**Dipl.-Kfm. Eckardt Günther,
Gabriele Struthoff-Müller**

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Registration Questions

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Agri Meetings**

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Accommodation

Omni Parker House Hotel

60 School Street Boston, MA
02108, USA
Phone: +1 617 227-8600
Fax: +1 617 742-5729

The Omni Parker House Hotel offers special room rates for our participants:

- \$ 109.00 for Petite Rooms
- \$ 135.00 for Standard Rooms

Reservation via www.pvrollout.us.

You are urged to make your reservations early. A limited number of rooms have been reserved until January 20, 2012 at the Omni Parker House. Please specify that you are enrolled in the PV Rollout program to receive the reduced room rates.

Conference Fee

Workshop Fee (Wednesday February 8, 2012):

Per Person: \$ 160.00

If registered by January 16, 2012:

Per Person: \$ 960.00

If registered after January 16, 2012:

Per Person: \$ 1260.00

At the door: \$ 1360.00

VAT **not** included.

OTTI members and members of supporting organizations will receive a **10 % discount**.

The price includes:

Conference materials, 2 continental breakfasts, coffee breaks, lunches and dinner on Thursday.

**Online Registration
at www.pvrollout.us**

Sponsorship packages

Gold Sponsor (\$15,000)

- **15 m²** area with one table, 2 chairs and electricity
- Free conference entrance for **four** employees
- Large-size publishing of the sponsor's company logo
- Five minutes company presentation in front of all participants
- **Only one package available**
- Details on Sponsoring Registration

Silver Sponsor (\$10,000)

- **10 m²** area with one table, 2 chairs and electricity
- Free conference entrance for **three** employees
- Medium-size publishing of the sponsor's company logo
- Three minutes company presentation in front of all participants
- **Only two packages available**
- Details on Sponsoring Registration

Bronze Sponsor (\$ 7,500)

- **6 m²** area with one table, 2 chairs and electricity
- Free conference entrance for **two** employees
- Medium-size publishing of the sponsor's company logo
- Three minutes company presentation in front of all participants
- **Only three packages available**
- Details on Sponsoring Registration

Lunch Sponsor (\$10,000)

- Give-aways and branded items like napkins, salt/pepper (provided by the sponsor, delivery to the conference venue)
- Free conference entrance for **one** employee
- Two popup displays during lunch
- Small-size publishing of the sponsor's company logo
- **Only two packages available**

Breakfast Sponsor (\$ 6,000)

- Give-aways and branded items like napkins, sugar (provided by the sponsor, delivery to the conference venue)
- Two popup displays during breakfast
- Free conference entrance for **one** employee
- Small-size publishing of the sponsor's company logo
- **Only two packages available**

Should you have special wishes concerning sponsoring, please let us know.

www.pvrollout.us

V-B-2011-10-24

Supporting Organizations



<http://cse.fraunhofer.org>



<http://www.ahk-usa.com>



<http://www.luxresearchinc.com>



<http://www.pvgroup.org>



International Solar

<http://www.eupd-research.com/Rollout>



Media Partners



<http://www.pv-magazine.com>



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<http://www.altenergymag.com>



<http://www.solar-pv-management.com>



<http://www.sunwindenergy.com>



<http://www.erasolar.es>



<http://www.newenergyworldnetwork.com/>

Timetable

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European American Solar Deployment Conference

