

Sandia National Laboratories and the Electric Power Research Institute (EPRI) are pleased to host the

2nd PV Performance Modeling Workshop



Photo courtesy of Semptra Energy

Dates: 1:00 PM to 5:00 PM on Wednesday, May 1, 2013
with special evening session 7:00 to 9:00 pm
8:00 AM to 5:00 PM on Thursday, May 1, 2013

Location: The Biltmore Hotel, 2151 Laurelwood Road, Santa Clara, CA

Credible estimates of PV system output are critical to successful development of large-scale PV projects. This workshop will provide information on advances in modeling, on pathways to reducing variability in model input and output, and on opportunities for standardizing modeling practice and reducing project risk.

Draft Agenda: Day 1, May 1

Registration 12:30 pm

Welcome & Introduction: Why Are We Here? 1:00 pm

An overview of the workshop will be presented, along with intended outcomes, goals and next steps.

- Welcome and Purpose Josh Stein, Sandia National Laboratories
- Summary of Previous Workshop Chris Cameron, Sandia National Laboratories (retired)
- Impact of Performance Modeling on Project Risk Speaker from the Investment Community

Module Models: Generating Performance Coefficients 1:55 pm

The selection of a module performance algorithm and associated module performance coefficients is a critical step in modeling system performance. These presentations will emphasize the process for deriving performance coefficients from test data.

- Generating Module Coefficients for Sandia Array Performance Model Cliff Hansen, Sandia
- Generating Module Coefficients for SAM/CEC n-parameter model Aaron Dobos, NREL
- Generating Module Coefficients for PVsyst Evan Riley, Black & Veatch

Break 3:00 pm

- Generating Module Coefficients for PVsyst and PV*SOL Ken Sauer, Yingli
- Changes in Module Performance Coefficient Generation for Version 6 André Mermoud, PVsyst
- Results of Blind Study of Module Performance Coefficient Generation Cliff Hansen, Sandia
- Discussion – Reducing Variability in Module Performance Coefficient Generation

Dinner (On Your Own) 5:00 pm

PV System Performance Models 7:00 pm

Developers of system models will present overviews or demonstrations of their models.

- User Input on Modeling Needs TBD
- PVsyst André Mermoud, PVsyst
- HelioScope Paul Grana, Folsom Labs
- PVSIM Mike Anderson, SunPower
- System Advisor Model Aron Dobos, NREL
- PV*SOL Invited

End of Day 1 9:00 pm

Draft Agenda: Day 2, May 2

Solar Resource Data

8:00 am

The expected solar resource at a site is critical to establishing project viability. This session will present methods to reduce project risk by addressing bias and uncertainty in solar resource data.

- Uncertainty and Bias in Modeled Data Invited
- Reducing Error Through On-Site Monitoring TBD, AWS Truepower
- Quantifying Uncertainty in Solar Energy Estimates Invited, Independent Engineer
- Improving Estimation of Plane-of-Array Irradiance Ben Bourne, SunPower
- Diffuse Irradiance in Tracking Systems TBD, First Solar
- Discussion – Reducing Solar Resource Error and Uncertainty

Break

10:00 am

System Losses and Derates

10:15 am

Estimates of system losses vary greatly among models and modelers. This session will seek to improve our understanding of system losses and the means of modeling them.

Mismatch Losses

- Survey Results – Definition of System Loss Factors Geoff Klise, Sandia
- Quantifying Mismatch Losses in Small Arrays Sara MacAlpine, U. of Colorado
- Calculation of Mismatch Losses due to Shading in PVsyst, v6 André Mermoud, PVsyst
- Modeling Mismatch Losses in HelioScope Paul Grana, Folsom Labs
- Calculating Model Shading Inputs from Design Data TBD, Borrego Solar
- Discussion – Standardizing Definitions of Mismatch Losses

Lunch

12:00 pm

System Losses and Derates (concluded)

1:00 pm

- Panel Discussion: Soiling, DC and AC Losses... First Solar, SunPower, Folsom Labs
- Modeling Module Power Degradation Ken Sauer, Yingli
- Field Study on Degradation Mike Anderson, SunPower

Break

3:00 pm

Modeling in the Real World

3:15 pm

- Inverter Clipping Losses TBD, First Solar
- Model Validation Methodology and Results TBD, SunPower
- Standards for Acceptance Testing and Model Validation Evan Riley, Black & Veatch
- Standardizing Definitions of Derates - Inputs to the Working Group Geoff Klise, Sandia

Discussion and Wrap-Up

4:15 pm

- Summary Discussion – Uncertainty in System Output Estimates Cliff Hansen, Sandia
 - Wrap-Up and Next Steps Josh Stein, Sandia
 - Contributing to the PVPMC Website
 - Supporting Development of Standards and Best Practices

Adjourn

5:00 pm