2024 PV Performance Modeling Workshop (V6)

Mon, May 6 5:30-7:30 PM	**CFV Labs** Welcome Happy Hour ar Squatters Pub 147 West Broadway, SLC	

Site:	**Salt Lake City, Utah USA**			
Day 1		**Tuesday, May 7, 2024**		
7:00	1:00	Breakfast and Registration		
8:00	0:10	Welcome from GroundWork Renewables	Ann Will	GroundWork Renewables
8:10	0:15	PVPMC Updates	Joshua Stein	Sandia National Laboratories
Session 1		**Complexities in PV Modeling**	**Chair: Marios Theristis**	Sandia National Laboratories
8:25	0:20	Tracking higher electricity prices	Adam Jensen	Technical University of Denmark
8:45	0:20	PV Atlas: charting a course to geographic insights for PV performance modeling	Kevin Anderson	Sandia National Laboratories
9:05	0:20	Modeling hybrid PV/CSP/ES systems for 100% Carbon Free Electricity to Load	Jennifer Braid	Sandia National Laboratories
9:25	0:10	Discussion		
9:35	**0:30**	**Networking Break**		
Session 2		**Site and Design Impacts and Derates**	**Chair: Clifford Hansen**	Sandia National Laboratories
10:05	0:20	Building an Advanced Soiling Loss Model with AI and Ground-Level Data	Catlin Mattheis	Fracsun
10:25	0:20	Energy Impact of Different Solar Tracker Wind Stow Strategies	Kendra Conrad	Array Technologies
10:45	0:20	An approach to modeling linear and non-linear self-shading losses with pvlib	Will Hobbs	Southern Company
11:05	0:20	An Updated Modeling Framework for Technology- and Market-Specific Shading Impacts on Annual Energy Yield	Kiran Balasubramanian	Maxeon Solar Technologies
11:25	0:20	Near Shading Reductions of Diffuse Sky Irradiance and the Impact on PV Plant Performance	Adam Kankiewicz	Origis Energy
11:45	0:15	Discussion		
12:00	**1:00**	**Lunch**		
Session 3		**Posters**		
13:00	1:00	**Poster Session**		
Session 4		**Modeling Snow Effects on PV Systems**	**Chair: Laurie Burnham**	Sandia National Laboratories
14:00	0:10	Why snow modeling matters?	Laurie Burnham	Sandia National Laboratories
14:10	0:20	Accurate modeling of albedo in winter (snow is an ever-changing substrate)	Daniel Riley	Sandia National Laboratories
14:30	0:20	Snow covered module I-V curve simulation	Norman Jost	Sandia National Laboratories
14:50	0:20	Snow shedding from single-axis tracking PV systems: observations from the Michigan Regional Test Center and implications for modeling widespread snow events	Ana Dyreson	Michigan Technical University
15:10	0:20	ERA5 vs. NOAA in calculated snow losses for PV	Usgal Zandanbal	DNV
15:30	0:15	Panel Discussion		
15:45	**0:30**	**Networking Break**		
Session 5		**PVPMC**	**Chair: Joshua Stein**	Sandia National Laboratories
16:15	0:15	Sandia's PV Performance Modeling Project Priorities for FY25-27	Marios Theristis	Sandia National Laboratories
16:30	0:20	2023 PVPMC Blind Modeling Comparison	Lelia Deville	Sandia National Laboratories
16:50	0:10	DOE Solar PV Data and Modeling Initiatives	Noreen Gentry	DOE Solar Energy Technologies Office
17:00	**1:00**	**Break before dinner**		
18:00		Welcome Reception and Dinner Hosted by GroundWork Renewables (open to all participants) Caffe Molise 404 S W Temple St, Salt Lake City - 6pm-9pm - 15 min walk or 3 minute Uber		

Day 2		Wednesday May 8, 2024		
	6:15 AM	Fun Run - Meet at Entrance to Hotel		
7:00	1:00	Breakfast		
Session 6		**Underperformance and Analytics for PV Plants**	**Chair: Justin Robinson**	GroundWork Renewables
8:00	0:20	Outcomes of actual-environment demonstration of fault diagnostic loss factors and trend-based loss predictive maintenance for utility-scale photovoltaic systems	Jürgen Sutterlüti	Gantner Instruments
8:20	0:20	A Practical Approach to Comparing Actual and Budgeted Production of Solar Sites: Solar Waterfall Analysis	Anjie Jiang	Univers
8:40	0:20	Estimation of Soiling Loss in Utility-Scale PV Plants from Production Data	Karel De Brabandere	3E
9:00	0:20	Validating Power Plant DC Performance	Jim Crimmins	CFV Labs
9:20	0:20	Advancing Technoeconomic Modeling of Hail Risk and Resilience	Jon Previtali	VDE Americas
9:40	0:15	Discussion		
9:55	0:30	**Networking Break**		
Session 7		**P90 and the Financial Value of Accurate Modelling**	**Chair: Keith McIntosh**	PV Lighthouse
10:25	0:15	Tax equity investor	Ken Elser	Wells Fargo
10:40	0:15	Independent engineering firm	Mark Reusser	ICF
10:55	0:15	Developer / Owner / Financer	Emily Greeno	Avangrid
11:10	0:15	Developer / Owner	Armando Solis	Lightsouce BP
11:25	0:15	Modeler	Clifford Hansen	Sandia National Laboratories
11:40	0:20	Moderated Discussion		
12:00	1:00	**Lunch Break**		
Session 8		**Solar Resource Assessment**	**Chair: Julie Chard**	GroundWork Renewables
13:00	0:20	New Capabilities in the National Solar Radiation Data Base (NSRDB)	Manajit Sengupta	NREL
13:20	0:20	Improving Performance Ratio Calculations Through Optimizing Front POA Irradiance Sensor Positioning	Damon Nitzel	OTT HydroMet
13:40	0:20	Introducing an Improved SolarAnywhere Historical Irradiance Product: Benchmarking against BSRN	Marc Perez	Clean Power Research
14:00	0:20	How much weather and solar resource data is enough?	Laura Hinkelman	Black & Veatch
14:20	0:20	What to consider for improved accuracy and reduced uncertainty in resource measurement campaigns	Annalise Miller	Luminate LLC
14:40	0:20	Gap-Filling Ground Measurements of Solar Irradiance	Alex Bryan	GroundWork Renewables
15:00	0:15	Discussion		
15:15	0:30	**Networking Break**		
Session 9		**Open Source Software and Applications**	**Chair: Kevin Anderson**	Sandia National Laboratories
15:45	0:15	Solar Data Tools Version 1 Release	Bennet Meyers	SLAC National Accelator Laboratory
16:00	0:15	Degradation and Soiling Loss Analysis Improvements in RdTools 3	Michael Deceglie	NREL
16:15	0:15	Enterprise wide PVlib Implementation	Ishtiza Azad	Southern Company
16:30	0:15	The "PVLib" of Degradation: PVDeg	Michael Kempe	NREL
16:45	0:15	A Uniform Taxonomy for Photovoltaic System Operations and Maintenance	Clifford Hansen	Sandia National Laboratories
17:00	0:15	Discussion		
17:15		**End of Day 2**		

Day 3		Thursday May 9, 2024		
7:00	1:00	Breakfast		
Session 10		**Spectral Modeling**	**Marios Theristis**	Sandia National Laboratories
8:00	0:20	Photovoltaic module energy losses due to cell-level spectral mismatch	Rajiv Daxini	University of Nottingham
8:20	0:20	Simple Photovoltaic Spectral Correction Predictive Model Based on FARMS-NIT Modeled Spectra	Alan Curran	First Solar
8:40	0:20	The uncertainty in yield forecasts due to the ever-changing solar spectrum	Keith McIntosh	PV Lighthouse
9:00	0:10	Discussion		
Session 11		**Modeling Updates from Industry**	**Chair: Lelia Deville**	Sandia National Laboratories
9:10	0:15	Modeling of advanced solar tracking algorithms with PVcase Yield	Andres Calcabrini	PVcase
9:25	0:15	Latest updates and future developments in Pvsyst	Michele Oliosi	PVsyst SA
9:40	0:15	Progress and lessons learned in the development of the 3D energy yield calculation model for the RatedPower software	Félix Ignacio Pérez Cicala	RatedPower
9:55	0:15	Tackling the Terrain: Custom Tracking Algorithms in Solar PV Plants in Complex Terrain	Javier Lopez-Lorente	DNV
10:10	0:15	Effect of Binning on 3D Shade Results	Kurt Rhee	Terabase Energy
10:25	0:15	Impact of High Fidelity Modeling on Estimating SAT (Single Axis Tracker) Plant Performance	Josh Wirth	Daly Energy
10:40	0:15	Discussion		
10:55	**0:30**	**Networking Break**		
Session 12		**O&M Harmonization**		
11:25	1:00	Group discussion on opportunities for standardizing O&M data and processes	Clifford Hansen and Marios Theristis	Sandia National Laboratories
12:25	**1:00**	**Lunch**		
		Parallel Session A	**Parallel Session B**	**Parallel Session C**
13:25	2:00	**pvlib-python Updates and Users Group Meeting** **Kevin Anderson (Sandia) & Adam Jensen (DTU)**	**SAM Updates and User Group Meeting** **Brian Mirletz & Matt Prilliman (NREL)**	**Industry Modeling Software Office Hours**
15:25	**0:20**	**Networking Break**		
		Parallel Session D	**Parallel Session E**	**Parallel Session C (contined)**
15:45	1:30	**pvcaptest Updates and demo** **Ben Taylor - Tailored Data Consulting**	**PVfit training and demo** **Marc Campanelli - Intelligent Measurments Systems LLC**	**Industry Modeling Software Office Hours**
17:15		**End of Workshop**		

Poster Session

Number	Title	Name	Institution
1	Spectral Correction for Systems with CdTe Modules During the Capacity Test	Bahram Emami	McCarthy Building Companies, Inc. – Renewable Energy
2	Spatial Smoothing Reduces PV Clipping!	Pradeep Ganeshbabu	SoftBank
3	In-Situ I-V for Soiling Measurement	Josh Horst	Atonometrics
5	Subhourly Clipping Correction Model Comparison	Matthew Prillman	NREL
6	An Algorithm for Enhanced PV Performance Analysis Utilizing Clipping Success Rates	Taylor Hollis	HK Analytics
7	Comparison of PAN File Generation Methods	Daniel Zirzow	CFV Labs
9	GAIA: Green AI Apprentice	Sai Krishna Gottipati	AI Redefined Inc
10	Spectral and Diffuse-Angular Corrections in Pvfit	Mark Campanelli	Intelligent Measurement Systems LLC
11	The National Climate DataBase (NCDB): A Bias-Corrected High-Resolution Climate Dataset	Manajit Sengupta	NREL
12	Recent Update of ASTM G173 Standard, Downstream Implications and Future Plans	Manajit Sengupta	NREL
13	An Assessment of the Impact of Height Dependent Windspeed on Energy Yield Estimation	Manajit Sengupta	NREL
16	Diagnosis of under-performing PV plants	David Smith	Wood PLC
17	The Impact of Climate Change on PV Plant Production	David Smith	Wood PLC
18	Optimal Partitioning Practices PVSyst Near Shadings	Suveer Panditrao	Standard Solar Inc.
20	Ultra-high efficiency modules: The end of the single-diode model?	Phillip Hamer	UNSW Sydney
21	Modelling Challenges with Irregular Utility-scale PV Plant Layouts	Shail Bajpai	Black & Veatch
22	Time Dilated Bundt Cake Analysis of PV Output	Mehmet Giray Ogut	Stanford University
23	Long-term shading impact on modules due to increase in tree height year over year using Pvsyst	Stephen John	Black & Veatch
24	Diagnostic value of the inverter performance ratio in plant performance troubleshooting	Jay Miller	Black & Veatch
25	Bifacial Solar Expected Energy Model	Ishtiza Azad	Southern Company
26	Shaded fraction and backtracking on rolling terrain	Adam Jensen	Technical University of Denmark
27	Model Continuity for Utility-Scale Solar: From Detailed Performance Modeling to Asset Operations	Christopher Valdivia	Enurgen Inc.