

2024 Reliability of PV Inverters Workshop Agenda

April 11–12, 2024

[NREL South Table Mountain campus](#), 15013 Denver W Pkwy, Golden, Colorado

Conference Room: RSF Building X320 'Beaver Creek'

Draft Agenda as of 22 March 2024. Sessions and speakers are subject to change.

Day 1: April 11, 2024	
8:00 – 8:30 AM	Registration
8:30 – 8:40 AM	Welcome – Bill Tumas, NREL Associate Laboratory Director
8:40 – 9:00 AM	Workshop goals, organization, and logistics – Daniel Friedman and Peter Hacke, NREL
Session 1: Present state of inverter reliability	
9:00 – 9:20 AM	Keynote: Motivating inverter reliability – Allan Ward, US DOE Solar Energy Technologies Office
9:20 – 9:40 AM	Service in the sun: The reality of PV inverter reliability – Auston Taber, FranklinWH Energy Storage, Inc.
9:40 – 10:00 AM	The problem today: The impact of inverter reliability on solar growth– Charity Sotero, kWh Analytics
10:00 – 10:35 AM	Q&A, Discussion: What are the biggest impacts for plant operators in the inverter reliability space?
10:35 – 10:55 AM	Break
Session 2: Routes and solutions for reliability challenges	
10:55 – 11:15 AM	Challenges and solutions of reliability testing of grid relays for PV applications – Wolfram Dege, SMA
11:15 – 11:35 AM	Condition monitoring as a methodology to cope with MOSFET unreliability – Johan Driesen, KU Leuven
11:35 – 11:55 AM	Long-term reliability challenges and solutions for central inverters – Bale Yang, Sungrow Power Supply Co.
11:55 – 12:30 PM	Q&A, Discussion: What are you seeing that could be helpful mitigating inverter challenges? What tools or resources would help?
12:30 – 1:35 PM	Working lunch with survey and discussion on the topic of R&D priorities from morning sessions, facilitated by Dan Friedman
Session 3: Lifecycle cost and ownership issues	
1:35 – 1:55 PM	Developing NREL analysis around inverter supply chains, manufacturing costs, and lifecycle cost of ownership issues – Michael Woodhouse, NREL
1:55 – 2:15 PM	Approaches towards use of total cost of ownership (TCO) metrics for PV inverters and beyond – Sumanth Lokanath, VDC Americas
2:15 – 2:35 PM	TBD
2:35 – 3:10 PM	Q&A, Discussion: What are the biggest expenses and highest priorities?
3:10 – 3:30 PM	Break
Session 4: Testing, standards, performance, and reliability metrics	
3:30 – 3:50 PM	Keynote: Ensuring safety and security--Implications for reliability and availability – Ken Boyce, UL Solutions
3:50 – 4:10 PM	Laboratory testing to assess durability of inverters and field experiences – Cherif Kedir, RETC
4:10 – 4:30 PM	Inverter production quality assurance and testing – Ignacio Carellan, Kiwa PI Berlin
4:30 – 5:05 PM	Q&A, Discussion: What testing or prequalification would you like to see to ensure reliability? Where are the gaps?
5:05 – 6:05 PM	NREL Energy System Integration Facility (ESIF) tours

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Day 2: April 12, 2024	
8:00 – 8:30 AM	Registration
Session 5: Lifetime of active and passive components	
8:30 – 8:50 AM	Lifetime testing and modeling of cooling fans in PV inverters – Zheyu Zhang, Rensselaer Polytechnic Institute
8:50 – 9:10 AM	Screening methodology for SiC MOSFETs – Anant Agarwal, The Ohio State University
9:10 – 9:30 AM	Live state of health monitoring of inverter subsystems – Faisal Khan, NREL
9:30 – 10:05 AM	Q&A, Discussion: What failure mechanisms are we not properly accounting for? How do we better accelerate the working environment of PV inverters to qualify components
10:05 – 10:25 AM	Break
Session 6: Data reporting, analytics, and data sharing	
10:25 – 10:45 AM	Characterization and survivability analysis of inverter faults through an analysis of O&M records – Thushara Gunda, Sandia National Laboratories
10:45 – 11:05 AM	PV inverter availability from the US PV fleet– Chris Deline, NREL
11:05 – 11:25 AM	TBD
11:25 – 12:00 PM	Q&A, Discussion: How can we use data analytics to predict availability, reliability, and performance?
12:00 – 1:05 PM	Working lunch with survey and discussion on the topic of R&D priorities from workshop Day 1 afternoon and morning day 2 sessions, facilitated by Dan Friedman
Session 7: Discussion-centric sessions on future of PV inverter reliability research, metrics for success, state of industry five years from now	
1:05 – 1:35 PM	Breakout sessions
1:35 – 2:05 PM	Report-out from breakout sessions
2:05 – 2:50 PM	Summary, adjournment
2:50 – 3:50 PM	NREL Energy System Integration Facility (ESIF) tours