U.S. Department of Energy
HelioCon
Heliostat Consortium for Concentrating Solar-Thermal Power

Heliostat Consortium Seminar Series

Brought to you by the Resource, Training, and Education (RTE) topic area

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Host: Dr. Rebecca Mitchell

Title: Concentrating Solar Power Capabilities at the National Renewable Energy Laboratory

When: January 12th
3-4 PM MST

Zoom:
https://nrel.zoomgov.com/j/1606259669?pwd=RTA1MHorUlNQZVRjeFNJZnRvekJwQT09

Abstract:

NREL features state-of-the-art equipment, facilities, and models for industry, government, and universities researching concentrating solar-thermal power (CSP) technologies. These capabilities support a broad range of CSP research and analysis - including CSP systems for power, heat, fuels, and stand-alone thermal energy storage systems. In this presentation, Mark Mehos will present an overview of NREL's capabilities, with an emphasis on optical and technoeconomic tools that can directly benefit HelioCon. NREL's Advanced Optical Materials Laboratory provides analytical and measurement capabilities for developing and testing optical properties and performance of materials used in CSP systems. Indoor and outdoor accelerated exposure facilities are available to determine CSP system materials' rates of degradation, estimated lifetimes, potential failure mechanisms, and strategies for mitigation. Outdoor solar-field characterization tools can be used for on-site testing at CSP parabolic trough and heliostat solar fields. Open-source models, including NREL-developed SolTrace, SolarPILOT, and System Advisor models are readily available to assess the performance and economics of CSP components and systems. Finally, NREL is actively leveraging knowledge gained from DOE's Wind Energy Technologies Office to leverage years of experience on high-fidelity computation fluid dynamic models and field instruments, applying that experience to assessing loads on in-field collectors.

Bio:

Mark has been with NREL since 1986. He currently manages the Thermal Systems R&D group with an emphasis on Concentrating Solar Power (CSP), thermal energy for grid storage, solar-thermal derived fuels, and thermal systems optimization. The emphasis of NREL's CSP program is the development of next-generation low-cost, high-performance, and high-reliability systems that use concentrated sunlight to generate power. He is currently the leader for the International Energy Agency's SolarPACES "Solar Thermal Electric Power Systems" task. The task supports international collaboration on the development of best practices for modeling, acceptance testing, and grid-integration of CSP systems. Mark obtained his M.S. in Mechanical Engineering from the University of California at Berkeley and his B.S. from the University of Colorado.