



# Heliostat Consortium Seminar Series

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



**Dr. Laura Schaefer**

Professor, Department  
of Mechanical  
Engineering, Rice  
University

**Host:** Dr. Brooke  
Stanislawski

**Title:** Feasibility  
Analysis of  
Implementing Small-  
scale CSP Systems for  
Industrial Process  
Heat on Urban  
Brownfields

**When:** April 23<sup>rd</sup>  
1-2 PM MT

**Zoom:** [https://nrel.zoom  
gov.com/j/1614519478](https://nrel.zoom.us/j/1614519478)

**Abstract:**

Solar sites that include applications with smaller footprints, towers, and corresponding heat levels could help provide more affordable, reliable energy. In particular, industrial energy consumption is an essential focus area, as industries account for a significant share of global energy demand. A major portion of industrial energy consumption is dedicated to industrial process heat (IPH), making the transition to more distributed and energy-independent heating, such as solar industrial process heat, critical. This work assesses the potential of urban implementation of small-scale heliostats on urban brownfields with combined cycle/storage technologies, paired with local industries. Repurposing these sites, which were formerly industrial and are now contaminated with waste, enables the utilization of abandoned land while providing near-use CSP-IPH in industrial zones. We model and simulate three different CSP-IPH plants, each with a 5 MW<sub>t</sub> capacity, using parabolic trough collectors (PTCs) and a molten salt power tower (MSPT) at varying IPH supply temperatures. Additionally, as a comparison case focused specifically on the rapid expansion of digital infrastructure, which has led to an increase in the number and capacity of data centers, we also explore a novel approach to waste heat recovery by integrating flat plate solar thermal collectors (FPCs) with an organic Rankine cycle (ORC) system.

**Bio:**

Dr. Laura Schaefer is the Burton J. and Ann M. McMurtry Professor in the Department of Mechanical Engineering at Rice University. She was formerly the Deputy Director of the Mascaro Center for Sustainable Innovation and Associate Director of the Center for Energy at the University of Pittsburgh. Her research centers on the analysis, design and optimization of energy systems, with an emphasis on improving energy efficiency and diversification. Her research has received over \$12 million in funding by organizations such as NSF, DOE, AFOSR, ASHRAE, PITA, and NCIIA. She is a Fellow of the American Society of Mechanical Engineers, the founding and former Editor-in-Chief of the Elsevier journal Sustainable Energy Technologies and Assessments, and a past Chair of the Advanced Energy Systems Division of ASME.