Energy Storage for Manufacturing and Industrial Decarbonization Workshop

"Energy StorM"

Enabling Carbon-Free Energy for Industrial Decarbonization

February 8-9, 2022

Hosted by:

DOE Panel – Programs & Priorities for Industrial Decarbonization

Panel Chair:

Alejandro Moreno, Deputy Assistant Secretary for Renewable Power, U.S. DOE Office of Energy Efficiency and Renewable Energy (EERE)

Panelists:

Joe Paladino, Program Manager, Grid Technical Assistance, U.S. DOE Office of Electricity (OE)

Eric Miller, Senior Advisor, U.S. DOE Hydrogen and Fuel Cells Technologies Office (HFTO)

Jay Fitzgerald, Chief Scientist and Program Manager, U.S. DOE Bioenergy Technologies Office (BETO)

Avi Shultz, Program Manager, Concentrating Solar-Thermal Power, U.S. DOE Solar Energy Technologies Office (SETO)

Alexis McKittrick, Program Manager, Hydrothermal Resources and Low Temperature and Coproduced Resources, U.S. DOE Geothermal Technologies Office (GTO)

Jason Marcinkoski, Program Manager, Integrated Energy Systems, U.S. DOE Office of Nuclear Energy

Biographies

Alejandro Moreno directs EERE's renewable energy applied research, development, and demonstration activities for the geothermal, solar energy, and wind and water power technology offices. In addition, he oversees EERE's energy system integration efforts. Previously, Moreno was

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the Director for the Water Power Technologies Office. In this role, he managed efforts to develop and commercialize innovative technologies and market solutions for clean, domestic power generation from hydropower and marine energy resources across the United States.

Working with DOE's national laboratories, academia, and industry, the program funds research, development, and deployment of water power systems through competitively selected, cost-shared projects with businesses, federal, state, and other stakeholder groups. Between his stints at DOE, he served in the energy groups of the World Bank and International Finance Corporation, where he designed and led regulatory reform programs to spur investment in clean energy and rural electrification.

Moreno holds a bachelor's degree from Stanford University and a master's degree in economics and energy policy from Johns Hopkins University School of Advanced International Studies.

Joe Paladino is a program manager within the US DOE Office of Electricity where he focuses on decision processes associated with the advancement and adoption of technologies and policies related to the transformation of the electric grid. He has served in both private and public organizations over the course of his career in efforts to apply and commercialize technology to address energy and environmental issues. He has served within the Department for nearly thirty years in program development and management roles. Notable efforts include the development of a technology maturation decision process for the DOE Office of Environmental Management, the consortium design for the Solid-State Lighting Initiative for the DOE Office of Energy Efficiency and Renewable Energy, and a grid modernization planning framework adopted by both regulators and utilities for the Office of Electricity. Significant work in OE includes establishing a metrics and benefits program to convey the impact of grid-related technologies deployed via the American Recovery and Reinvestment Act of 2009. Prior to joining the Department, Mr. Paladino worked at the Westinghouse Electric Corporation in Pittsburgh, Pennsylvania where he was involved in technology development and commercialization efforts to address nuclear waste management issues domestically and abroad. He was also the Sales Manager of a joint venture between Westinghouse and a biotech firm to advance the application of antibody technology for chemical analysis applications. Mr. Paladino has an A.B. in Biology from Middlebury College and an M.S. in Civil Engineering from the University of Pittsburgh. He also holds a patent for a design for a low-level radioactive waste disposal facility.

Dr. Eric L. Miller serves as Senior Advisor at the Hydrogen and Fuel Cell Technologies Office of the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy, where he plays important roles in the Department's Hydrogen Energy Earthshot and H2@Scale Initiatives to enable affordable, reliable and secure energy through clean hydrogen production from diverse domestic resources and utilization across multiple sectors. He earned undergraduate degrees from Cornell in Applied and Engineering Physics, and in Computer Science; and Masters and Doctorate degrees from the University of Hawaii at Manoa in Electrical Engineering, where his research focused on developing new energy-conversion materials and devices. His professional career in alternative energy research has spanned more than 30 years, centering on solar energy conversion and on hydrogen and fuel cell technologies; and he is globally recognized for his

pioneering research in the field of photoelectrochemical hydrogen production. At DOE, Dr. Miller has been recognized for his role in fostering impactful cross-office collaborations, including creation of the Department's Energy Materials Network for accelerating materials discovery and development critical to a broad spectrum of key clean energy technologies.

Dr. Jay Fitzgerald is the Chief Scientist for the Bioenergy Technologies Office (BETO) at the U.S. Department of Energy (DOE) as well as the Program Manager for the BETO Data, Modeling, and Analysis subprogram.

As BETO's Chief Scientist, Jay helps guide scientific program direction for overcoming challenges in the conversion of biomass and wastes into low-carbon fuels, chemicals, and materials. He specifically focuses on sustainable aviation fuel, synthetic biology, performance-advantaged bioproducts, and chemical and biological conversion of plastics.

As Program Manager for BETO's Data, Modeling, and Analysis subprogram, Jay oversees programmatic direction for a portfolio of cross-cutting projects focused on strategic analysis and sustainability benefits of biofuels, bioproducts, and bioenergy.

Jay was previously a Technology Manager for the Conversion subprogram in BETO where he managed the Agile BioFoundry consortium and bioconversion work. Jay was also an American Association for the Advancement of Science, Science and Technology Policy Fellow at the DOE Office of Science Office of Biological & Environmental Research.

Jay holds a B.A. in biochemistry and a minor in economics from Middlebury College. He completed his Ph.D. in organic chemistry at Stanford University with Professor Chaitan Khosla, focusing on the biosynthesis of medicinally useful polyketides.

Dr. Avi Shultz is the program manager for concentrating solar-thermal power (CSP) for the U.S. Department of Energy's Solar Energy Technologies Office (SETO), which supports research, development, and demonstration of solar-thermal components and systems that can enable wide-spread deployment of low-cost CSP with thermal energy storage. Dr. Shultz has been with SETO since 2013, where he started as a science and technology policy fellow, supporting the CSP program on a wide variety of topics.

Before joining SETO, Dr. Shultz was a post-doctoral fellow at the University of Amsterdam, after getting his Bachelor and Doctoral degrees in Chemistry, from Columbia University and Northwestern University, respectively.

Dr. Alexis McKittrick is a Program Manager with the U.S. Department of Energy's Geothermal Technologies Office overseeing both the Low Temperature & Co-Produced Resources and Hydrothermal Resources research portfolios. In this role, she leads a team that supports research, development, and demonstrations across a range of geothermal technology platforms, including district heating and cooling systems, ground-source heat pumps, thermal energy storage, hydrothermal power production, advanced drilling technologies, and extraction of critical minerals from geothermal fluids.

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Prior to joining DOE in April 2020, Dr. McKittrick was a senior researcher at the IDA Science & Technology Policy Institute, where she worked with the White House Office of Science & Technology Policy and various agencies across the executive branch on a wide variety of science and technology research initiatives. In this role, she led the development of a 5-year research roadmap for DOE's Frontier Observatory for Research in Geothermal Energy (FORGE). Dr. McKittrick also has prior experience in the U.S. Environmental Protection Agency (EPA) Climate Change Division, where she focused on greenhouse gas analysis and monitoring for the oil and gas, semiconductor, chemicals, and materials industries. She has a B.S. in chemical engineering from the University of Maryland, Baltimore County (UMBC) and a Ph.D. in chemical engineering from Georgia Institute of Technology.

Jason Marcinkoski spent 15 years at DOE, beginning in 2006 working on hydrogen and fuel cells. He recently developed DOE's hydrogen truck targets, but also developed technical targets for fuel cell distributed generation for combined heat and power. In the hydrogen office (HFTO), he accelerated high-temperature electrolysis system development and testing for nuclear hydrogen production. He moved to DOE's Nuclear Energy Office in 2021 to focus on nuclear energy systems, where he focuses on expanding nuclear energy use in the industrial and transportation sectors; using thermal energy storage to improve the capability for nuclear plants to respond to increasingly variable grid loads; and continuing to develop nuclear hydrogen production capabilities. M.S. Mechanical Engineering, UMD; specialized in hybrid vehicle technology.

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