

Through the Valley of Death: Taking Emerging Seasonal Energy Storage Technologies from Research and Development through Deployment

**Select Committee on California's Clean Energy Economy
Assemblymember Bill Quirk, Chair**

**Wednesday, August 18, 2021, 1:30 P.M.
California State Capitol, Room 4202**

SPEAKER BIOGRAPHIES

Seasonal Energy Storage (SES): A Necessity for the Zero Carbon Grid

Dr. Sarah Kurtz, Professor, University of California Merced, School of Engineering

Sarah Kurtz obtained her PhD in 1985 from Harvard University and worked for more than 30 years at the National Renewable Energy Laboratory, in Golden, CO. She is known for her contributions to developing multi-junction, GaInP/GaAs solar cells, and, more recently, her work with photovoltaic (PV) performance and reliability. Her work has been recognized with a jointly received Dan David Prize in 2007, the Cherry Award in 2012, a C3E Lifetime Achievement Award in 2016, and induction into the National Academy of Engineers in 2020. She has now moved to the University of California Merced, where she is studying the value of long-duration storage under a California Energy Commission grant and is excited to have the opportunity to support the state of California in its adoption of renewable energy through research and education.

Gabe Murtagh, Lead Infrastructure and Regulatory Policy Developer, California Independent System Operator

Gabe has 10 years of electricity industry experience, and is currently the storage sector manager at the California Independent System Operator (CAISO). In that role, Gabe oversees storage related policy and acts as a liaison on storage related issues outside of the CAISO. Gabe also has experience developing resource adequacy and backstop procurement policy for the CAISO. Prior to developing policy, Gabe worked as a market monitoring analyst and compiled detailed reports on overall market performance. Gabe holds a master's degree in economics and a bachelor's of science degree in computer science and engineering.

Commercializing SES Emerging Technologies

Alex Morris, Executive Director, California Energy Storage Alliance

Alex is the Executive Director of the California Energy Storage Alliance, where he directs CESA's engagements in a range of California and Federal agencies, workgroups and associations. Alex Morris is also Vice President of Strategen's consulting and advocacy practice. He is responsible for policy and regulatory affairs, and leads strategic policy consulting for businesses and government groups. Alex has more than 10 years of experience in policy and regulatory work, leading major efforts to shape and promote policy or regulatory outcomes at the California legislature, CAISO, the Federal Energy Regulatory Commission (FERC), and other agencies. Alex also brings years of utility-focused strategic consulting experience to Strategen, and has worked closely with utility, private, and trade groups to shape and execute on strategic business plans. Alex has focused on a broad range of cutting-edge topics such as Storage Legislation, Electric Market Design, Renewables Integration, FERC Policy, Smart grid, Electric Transportation and Plug-in Vehicles, Rate Design, the California Solar Initiative, and more. Alex joined Strategen in 2015 and previously worked for electric utilities Pacific Gas & Electric and Southern California Edison after receiving his MBA from the University of California, Davis.

Dr. Scott Burger, Senior Manager, Analytics, Form Energy

Scott Burger is the Senior Manager of Analytics at Form Energy. The Analytics team, which Scott leads, is responsible for developing and delivering the electricity market and project modeling and data science that powers Form's commercial, strategy, battery product management, and policy and regulatory affairs activities.

Prior to joining Form Energy, Scott was a Fellow on the World Economic Forum's (WEF) Global Future Council on Energy and a Lecturer and graduate student at the Massachusetts Institute of Technology. Scott's research at MIT focused on improving the equity of decarbonized and decentralized electricity systems.

While at MIT, Scott held various roles commercializing early-stage climate technologies. Scott developed and deployed models to help Breakthrough Energy Ventures and the Prime Coalition better target investments that have the potential to dramatically reduce greenhouse gas emissions. Scott served as the Director of Operations for Prime Coalition, where he led Prime's technology diligence and investment operations, from initial diligence through investment. Prior to Prime, Scott served as the Managing Director of the MIT Clean Energy Prize (CEP). Scott increased the CEP's funding by over 60 percent, building it into the nation's largest entrepreneurship competition of its kind. Prior to MIT, Scott was the Director of Engineering for Circular Energy, and an Analyst with GTM Research.

Dr. Ravi Prasher, Associate Lab Director, Energy Technologies Area Office, Lawrence Berkeley National Laboratory

Dr. Prasher is the Associate Lab Director of the Energy Technologies Area (ETA) at Lawrence Berkeley National Laboratory (Berkeley Lab). He is also an adjunct professor in the Department of Mechanical Engineering at the University of California, Berkeley. He has more than 20 years of experience in working in R&D in large industry, startup, government and academia. ETA, with a staff of more than 400 personnel, does research and analysis in a wide variety of areas, including building technologies, energy storage, renewable energy, manufacturing science and technology, and sustainable transportation technologies and tools. Ravi earlier worked as one of the first program directors at the Department of Energy's Advanced Research Projects Agency-Energy (ARPA-E). Ravi has published more than hundred archival journal papers in science and engineering journals. He holds more than 30 patents. He is a fellow of the American Society of Mechanical Engineers. Ravi obtained his B.Tech. from the Indian Institute of Technology Delhi and Ph.D. from Arizona State University.

The State and Federal Government's Role in Scaling up SES Technologies in Time for 2045

Mike Gravely, Research Program Manager, California Energy Commission

Mike Gravely is the Team Lead and Senior Electrical Engineer for the Energy Systems Research Office at the California Energy Commission. His team is managing over \$300 million in microgrid, energy storage and related energy research and demonstration projects. In this role, he oversees the full spectrum of research activities to improve the California Electric Grid including assessing future energy storage needs for California and addressing the grid related issues associated with integrating higher concentrations of renewables. In 2020, the Energy Commission awarded over \$100 million in state funds and vendor cost-share investments to over 25 new grants to complete research and demonstration projects with new and emerging energy storage technologies. One key area of this research is focused on understanding the capability and value of long duration energy storage solutions (from 10 hours to 100+ hours) to assist California in transitioning to the goal of 100 percent zero-carbon resources by December 31, 2045.

Mike Gravely has a BSEE from the Virginia Military Institute and an MSEE from California State University at Sacramento. Prior to the Energy Commission, Mike served in executive positions in the Federal Government and private industry including addressing the business challenges of a startup energy storage company. Mike also serves as the Military Advisor to the Chair of the California Energy Commission. As Military Advisor he leverages his over 22 years of military service to coordinate Energy Commission activities with the Department of Defense bases in California.

Dr. Babu Chalamala, Manager, Energy Storage Technology & Systems, Sandia National Laboratory

Dr. Babu Chalamala is Manager of the Energy Storage Technology and Systems Department and Program Manager for Grid Energy Storage. Prior to joining Sandia in 2015, he was a Corporate Fellow at MEMC - Monsanto Electronic Materials Company where he led R&D and product development in energy storage technology. Before that, he had founding roles in two startup ventures commercializing large format lithium batteries and digital x-ray sources. Earlier, as a research staff member at Motorola and Texas Instruments, he made significant contributions to vacuum microelectronics and flat panel display technologies.

He is a Fellow of the IEEE (Institute of Electrical and Electronics Engineers) and Academy of Sciences St Louis, and a member of the Materials Research Society and the Electrochemical Society. He currently serves on the IEEE Power and Energy Society Technical Council and as Chair of the IEEE PES (Power and Energy Storage) Energy Storage and Stationary Battery Committee. He served on the IEEE Fellow Committee and on the editorial boards of the Proceedings of the IEEE, IEEE Access, Journal of Display Technology and Energy Storage Journal. An active member of the Materials Research Society, he served as General Chair of the 2006 MRS Fall Meeting and as the Chair of the MRS Turnbull Award Committee. He has received his B.Tech degree in Electronics and Communications Engineering from Sri Venkateswara University and his PhD degree in Physics from the University of North Texas. He authored over 120 papers and received 9 US patents.