

Energy Storage for Manufacturing and Industrial Decarbonization Workshop

“Energy StorM”

Enabling Carbon-Free Energy for Industrial Decarbonization

February 8-9, 2022

Hosted by:



Analysis and Valuation Panel

Panel Chairs:

Sarang Supekar, Principal Systems Scientist, Argonne National Laboratory

Daniel Ginosar, Distinguished Staff Engineer, Idaho National Laboratory

Panelists:

Erin Childs, Director, Strategen

Patrick Balducci, Manager of the Power Systems and Markets Research Group, Argonne National Laboratory

Emma Elgqvist, Group Manager, Modeling & Analysis, National Renewable Energy Laboratory

Franziska Schöniger, Researcher, TU Wien

Jeremy Twitchell, Energy Research Analyst, Pacific Northwest National Laboratory

Rebecca O’Neil, Pacific Northwest National Laboratory

Biographies

Dr. Sarang Supekar is a staff scientist in the Energy Systems Division. His research is on advanced manufacturing technologies and manufacturing systems that could achieve transformative gains in process productivity and enhance manufacturing sustainability. He also develops optimization and life cycle models analyzing energy technologies and energy and

transportation systems of the future. Dr. Supekar's specific areas of interest include (1) process modeling, optimization, and data-driven decision making in manufacturing systems and supply chains; (2) analysis of productivity, life cycle energy, and economic benefits of smart manufacturing systems; (3) gas-based technologies to mitigate water use and pollution in energy-efficient "dry factories"; (4) life cycle assessment, thermodynamic analysis, and techno-economic analysis of industrial technologies and bio-geochemical pathways for carbon capture and utilization; and (5) optimization and simulation models for technology forecasting and policy analysis for a low-emissions energy future.

Dr. Daniel M. Ginosar received his B.S. in chemical engineering in 1981 from U.C. Davis and his Ph.D. in chemical engineering in 1994 from the University of Kansas. He has been employed at the INL since 1993 and is currently a Distinguished Staff Scientist in the Biological and Chemical Processing Department. Dr. Ginosar serves as the Deputy Focus Area Leader of the Improving Reuse and Recycling focus area within the Critical Materials Institute and is the Market Area Lead for the Advance Manufacturing Market Area in the Energy and Environment Science and Technology Division. Dr. Ginosar's research has focused on developing catalysts and catalytic processes to produce low carbon-footprint fuels. Recent projects have focused on solid acid alkylation coupled with supercritical fluid catalyst regeneration, hydrogenation of carbon oxides to produce liquid fuels, catalysts for thermochemical water splitting cycles to produce hydrogen, and the conversion of waste vegetable oils and fats using a solid catalyst/supercritical fluid process to produce biodiesel. Dr. Ginosar has authored 39 peer-reviewed publications, six book chapters, 30 U.S. and international patents, and numerous technical presentations in the above areas.

Erin Childs is a Director in the Strategen Consulting practice where she focuses on serving industry and utility clients on a range of issues relating to grid planning and decarbonization, emerging technologies and new business models, and retail and market incentive mechanisms.

Prior to Strategen, Erin worked at Southern California Edison (SCE) for over seven years. At SCE she held a variety of roles in strategy, planning, regulatory and procurement. Erin was a thought leader for SCE's economy-wide decarbonization strategy where she supported ground-breaking clean energy and distributed resource procurement and led utility-of-the-future implementation.

Erin holds bachelor's degrees in Mathematics and Environmental Economics from Pomona College.

Patrick Balducci is the Manager of the Power Systems and Markets Research Group in the Center for Energy, Environmental, and Economic Systems Analysis at Argonne National Laboratory. Prior to joining Argonne, Patrick served as a Chief Economist at the Pacific Northwest National Laboratory (PNNL), where he served for nearly 20 years. At PNNL, he led the energy storage analytics team where his research focused on storage valuation, integration, performance characterization, and control systems. In this role, he led research efforts evaluating the benefits of 1.6 GW / 18 GWh in energy storage capacity at 16 sites across the U.S. He also led efforts to

enhance economic assessment tools for the U.S. Department of Energy. Patrick serves on the Board of Directors of the Pacific Northwest Regional Economics Conference. He holds a BS in Economics from Lewis and Clark College, where he graduated with honors, and an MSc in Applied Environmental Economics from the University of London, Imperial College of London.

Emma Elgqvist is the group manager for the Modeling and Analysis Group, a team of technical experts who provide support to government and private entities with techno-economic modeling and analysis for renewable energy, energy storage, and microgrid projects to meet aggressive energy goals. She is the lead for the REopt tool, an optimization platform used to evaluate cost-optimal selection and sizing of behind-the-meter energy assets for grid-connected and off-grid energy systems. Elgqvist also leads the NREL Federal Energy Management Program (FEMP) technical assistance program that provides agencies with support in the most critical areas of RE project development.

Franziska Schöniger is a researcher and PhD candidate at the Energy Economics Group (EEG) since December 2017. She is part of a team dealing with policy-related research in the area of energy policy and energy economics with a focus on renewable energy technologies. She did her studies in the field of Energy Economics and Renewable Energy Technology in Austria, Morocco, New Zealand, and Denmark.

Her research interests and past project works include (open source) energy system modelling, integrated assessment of energy systems with increasing shares of renewable energies, design and evaluation of energy policy strategies, feasibility and impacts of RES targets for 2030 and beyond, flexibility and storage options and needs, and the econometric analysis of European energy markets.

Jeremy Twitchell is an energy research analyst at the Pacific Northwest National Laboratory, where he leads the equitable regulatory environment area of the PNNL Energy Storage Program and assists in distribution system planning research. In those roles, he is responsible for reaching out to states to provide technical assistance in analyzing energy storage and other developing energy resources and incorporating them into utility planning and procurement activities.

Prior to joining PNNL, Jeremy spent five years at the Washington Utilities and Transportation Commission, where he was the staff lead for the development of policies associated with the treatment of energy storage in utility resource planning and rulemaking. His work has supported integrated resource planning, which included development of a distribution planning rule. He participated in multiple utility advisory groups on energy efficiency and resource planning, provided expert testimony in the areas of rate design and resource acquisition, and oversaw renewable resource portfolio standard compliance. He also testified before the Washington State Legislature and prepared a report to the Legislature on best practices in distribution system planning. He has presented on the topics of energy storage, renewable resource portfolio

standards, and renewable resource integration at regional, national, and international conferences.

Ms. Rebecca O'Neil is an advisor for Pacific Northwest National Laboratory. In her career at the Laboratory, she has served as the lab relationship manager for the US DOE EERE Renewable Energy portfolio, served a rotation into the U.S. Department of Energy's Water Power Technologies Office to develop a hydropower-grid research program, and led the regulatory area for energy storage. Her research interests relate to energy justice, energy storage, community-scale innovation, sustainable hydropower and marine energy development. She joined PNNL in 2015 from the Oregon Department of Energy, where she represented the agency on water power development, oversaw the state renewable portfolio standard, and ran a multi-million-dollar portfolio of federal grants ranging from renewable energy feasibility studies, agricultural efficiency measures, energy assurance, and woodstove replacement programs. Before her state service, she managed the multifamily energy efficiency program for the Energy Trust of Oregon, administering incentives to drive upgrades in multifamily dwellings. For years, Rebecca represented a coalition of river conservation and recreation organizations in federal hydropower dam licensing, becoming a recognized and published expert in the regulatory process and the relationship between hydropower operations and environmental effects. She serves on multiple organizational boards and advisory groups related to renewable energy. Unrelated to energy, Rebecca has served as an AmeriCorps-VISTA teaching childhood literacy in rural Kentucky. As a Wagoner Scholar, she conducted Honors work in Cape Town, South Africa, producing a thesis on the role of literacy in manumission. She is a civilian advisory graduate of the National Security Seminar at the U.S. Army War College in Carlisle, Pennsylvania. She earned a B.A. from Rice University in Houston.