

H2-PACE: Power And Control Electronics for Hydrogen Technologies

A U.S. DOE Hydrogen Shot Experts Virtual Meeting
December 2-3, 2021

Plenary Speakers

Sunita Satyapal

Director, U.S. DOE Hydrogen and Fuel Cell Technologies Office

Dr. Sunita Satyapal is the Director for the U.S. Department of Energy's (DOE's) Hydrogen and Fuel Cell Technologies Office and coordinates activities across offices for the U.S. DOE Hydrogen Program. She is responsible for more than \$150 million per year in hydrogen and fuel cell research, development, demonstration, and deployment activities. She has two and a half decades of experience across industry, academia, and government, including at United Technologies managing research and business development, and as a visiting professor. She also coordinates across international hydrogen activities and is currently Vice-Chair of the International Partnership for Hydrogen and Fuel Cells in the Economy, a partnership among over 20 countries to accelerate progress in hydrogen, and she serves as co-lead for hydrogen efforts within the Clean Energy Ministerial and Mission Innovation. She received her Ph.D. from Columbia University and did postdoctoral work in Applied and Engineering Physics at Cornell University.



She has numerous publications, including in Scientific American, 10 patents, and a number of recognitions including a Presidential Rank Award.

Panel 1 – Electrolyzer Systems: Status and Needs (*Low- & High Temperature*)

Monjid Hamdam

VP of Engineering, Electrolyzer Systems, Plug Power

Mr. Hamdan, VP of Engineering of Electrolyzer Systems at Plug Power, Inc. is responsible for developing and manufacturing the electrolyzer product lines at Plug Power, which include stacks and systems ranging in size from 1-MegaWatt (MW) to industrial-scale multi-MW units. He has over 30 years of experience in PEM electrolyzers and electrochemical systems and holds several US patents in the related field.



Kathy Ayers

VP of R&D, Nel Hydrogen US

Kathy Ayers is Vice President of R&D for Nel Hydrogen US, focused on hydrogen generation via water electrolysis. Dr. Ayers manages a broad portfolio of projects from basic research to production implementation, across a range of collaborators in academia, industry, and national labs. She has also served in multiple advisory capacities for DOE. Dr. Ayers received her Ph.D. in chemistry at Caltech and spent 10 years in the battery industry before joining Nel. She has received multiple research awards and became a Fellow of the Electrochemical Society in 2020.



Joe Poindexter

Hydrogen Products Manager, Teledyne

Joe Poindexter is the Hydrogen Products Manager at Teledyne Energy Systems. Joe is responsible for sales, customer support, and product development for their product line of Alkaline Electrolytic Hydrogen Generators. In Joe's 25 years working in Teledyne's Hydrogen Products group, he has worked on all aspects of the product line including: product design, field service, customer training, sales, and business development. He has played a large role in their successes over the last few decades. Joe lives in Westminster, MD with his wife, Mary Beth, and their 6 children.



Carl Cottuli

VP of Systems Engineering, Bloom Energy

Currently holding the role of Vice President of Systems Engineering at Bloom Energy, Carl has the responsibility for the product development of solid oxide fuel cell (SOFC) and solid oxide electrolyzer cell (SOEC) products driving the system architecture for the mechanical and electrical requirements. Carl has over 25 years of experience in managing global technical teams engaged in government, industrial and enterprise opportunity engagement, capture and execution with direct experience in electrical/mechanical product and system design, installation and service industries.



The majority of his background experience has come by working with leading corporations such as Russelectric, Schneider and Eaton while holding senior leadership positions and advising on corporate strategy, organizational design, product roadmap and focusing the team on the addressable markets for the various products. His educational background consists of an Electronic Engineering degree and continuing education in course work focused on gaining direct knowledge as needed in various roles to include project management, process development and lean building. Carl currently holds over a dozen patents for power and cooling technology.

Casey Brown

Principal Engineer, Solid Oxide Technology Development, FuelCell Energy

Casey Brown is a Principal Engineer of Solid Oxide Technology Development with FuelCell Energy (FCE). Casey C. Brown has 25 years of professional background in heat exchange and solid oxide fuel cell technology. He possesses wide experience in leading teams in the development of new and novel technologies and in bringing products and processes from concept to reality. Casey leads the technical development of the FCE solid oxide stack platform, and has led efforts on integration of electrolysis, single cell and stack operation at up to 20 bar operating pressure, as well as development and integration of automated cell and stack production technology.



Panel 2 – Fuel Cell Systems: Status and Needs (*Stationary and Transportation*)

Akshay Sarin

Power Electronics Engineer, Fuel Cell Applications Team, *General Motors*

Akshay Sarin received the B.Tech. degree in electrical engineering from the Indian Institute of Technology Roorkee, and the M.S. and Ph.D. degrees in electrical and computer engineering from the University of Michigan, Ann Arbor, in 2017 and 2021, respectively. He is currently working as a Power Electronics Engineer with the Fuel Cell Applications Team, General Motors. His research interests include modeling and control of power electronics for renewable energy systems.



Derek Rotz

Director of Advanced Engineering, *Daimler*

Derek Rotz serves as director of advanced engineering at Daimler Trucks North America where his main focus areas include research into vehicle efficiency, active safety and more recently zero-emission vehicles. Prior to this he acted as principal investigator for SuperTruck 1 and led several company initiatives to save fuel. Derek has a bachelors of Physics from the University of St. Thomas and earned a Masters of Business Administration at the University of Warwick.



Shinichi Hirano

CTO, *Hyzon*

Shinichi Hirano, CTO, joined Hyzon Motors in May 2021. A 30-year veteran of automotive fuel cell technology, including 17 years in a leadership role at Ford. Shinichi also led the Ford-Daimler fuel cell alliance and USDRIVE/USCAR FC teams in partnership with the USDOE.



George Berntsen

Manager of Software and Electrical Engineering, Doosan

George Berntsen joined Doosan Fuel Cell America in 2019 as the Manager of Software and Electrical Engineering. He leads a team responsible for power conditioning, plant controls and remote monitoring systems and supports new applications and installations. George was a Working Group member for the “IEEE Standard for Interconnection and Interoperability of Distributed Energy Resources with Associated Electric Power Systems Interfaces” (IEEE-1547-2018). He has over 20 years’ experience in the fuel cell stationary power industry and has authored or co-authored nine U.S. patents. George has a B.S. in Instrumentation and Electronics Technology from the University of the State of New York and is a graduate of the U.S. Navy Nuclear Propulsion Program.



Minyu Cai

Power Electronics Engineering Lead, Cummins

Minyu Cai received the Ph.D. degree in electrical engineering from Purdue University in 2017. In the same year, he joined Cummins Corporate R&T, Electrification Technologies. Currently, he is a Power Electronics Engineering Lead leading fuel cell power electronics development for both transportation and stationary applications at Cummins.



Scott Swartz

CTO and Co-Founder, Nexceris

Dr. Scott L. Swartz is the Chief Technical Officer and a co-founder of Nexceris, in Lewis Center, Ohio. Dr. Swartz holds a B.S. in Ceramic Engineering from Alfred University, and a Ph.D. in Solid State Science from The Pennsylvania State University. Since 1994, Dr. Swartz has led Nexceris’ technology development activities, resulting in the company’s emergence as one of the preeminent product and technology providers in the areas of solid oxide fuel cell, electrolysis, and related electrochemical ceramic technologies.



Panel 3 – Industrial Electronic Components & Devices

Tim McDonald

Senior Consulting Advisor, CoolGaNTM Program, Infineon

Tim is currently Senior Consulting Advisor for Infineon's CoolGaNTM program. Tim serves as Chair of the JEDEC JC-70.1 subcommittee on standards for reliability qualification, test methods and datasheet parametrics for (GaN) widebandgap power conversion devices and is committee Vice Chair for JC-70 (which also includes Silicon Carbide device standards). Tim also serves on the Board of Directors for the Power Sources Manufacturers Association (PSMA)



Tim has over 35 years of diversified experience in power conversion/management and has held senior level positions in device engineering management, product and market development, product engineering, device characterization, test platform development and operations.

Tim holds a Bachelor of Science degree in Physics from the University of California at Los Angeles (UCLA).

Kraig Olejniczak

Research Scientist for Medium- and High-Voltage Power Products, Wolfspeed

Kraig J. Olejniczak earned his B.S.E.E. degree from Valparaiso University in 1987. His M.S.E.E. and Ph.D. degrees were granted by Purdue University in 1988 and 1991, respectively. He then joined the Department of Electrical Engineering at the University of Arkansas where he led the university's High Density Electronics Center's effort in the power electronic miniaturization and packaging thrust area. After serving on the faculty for 11 years, in August 2002, he assumed leadership of Valparaiso University's College of Engineering. After serving his alma mater for 11 years, Dr. Olejniczak resigned his tenure to join his colleagues at APEI in Fayetteville, AR. He served as co-founder, chairman of the board, and senior manager for motor drives and electric utility applications until July 2015 when APEI was acquired by Cree Inc. He now serves Wolfspeed Inc. as a Research Scientist for Medium- and High-Voltage Power Products. He is a member of Tau Beta Pi and Eta Kappa Nu. He is a senior member of IEEE and a licensed professional engineer in the State of Arkansas.



Atulya Yellepeddi

Senior Research Scientist, Algorithmic Systems Group, Analog Devices

Atulya Yellepeddi is a Senior Research Scientist in the Algorithmic Systems Group in the Analog Garage, the advanced R&D center of Analog Devices. He earned his PhD degree in Electrical Engineering and Applied Ocean Science and Engineering from the Massachusetts Institute of Technology and the Woods Hole Oceanographic Institution in 2016. He has worked on and led several projects on algorithm and system design for a variety of sensing technologies (including Time-of-Flight sensing, Lidar and Radar) and machine health applications (such as for semiconductor fabrication plants). He is the author of several peer reviewed publications, a reviewer for multiple journals, and the named inventor on a number of patents. He is also a guest lecturer at MIT for a class on Algorithms on Inference in the Electrical Engineering department.



Tim Varhue

Lead, Product Management, Dynapower

Timothy Varhue Leads Product Management for the Clean Energy and Power Systems groups at Dynapower Company. In this role, he is responsible for product strategy, product development and leading the product development team. Recently he has worked to launch Dynapower's new line of next generation products for Utility Scale, C&I and PV+S energy storage applications. Previously, Timothy worked in energy storage as an Electrical Engineer at Dynapower and as a Sales Engineer at Fluence Energy. Timothy holds a degree in Electrical Engineering from the University of Vermont and a Masters of Management from the University of Melbourne.



Bart de Vries

Business Development Manager, VONK

Bart studied in the Netherlands at the Technical University of Twente, where he obtained his master degree in Innovation Management. He has nearly 15 years of experience with Energy in various forms. Bart is now Business Development Manager at VONK with focus on Power Conversion solutions for the Energy Transition, such as for electrolyzers.



Panel 4 – Commercial Systems Development & Qualification

Kevin Delsol

Services Business Development, GE Power Conversion

GE Power Conversion applies the science and systems of power conversion to help drive the electric transformation of the world's energy infrastructure. Designing and delivering advanced motor, drive and control technologies that evolve today's industrial processes for a cleaner, more productive future, it serves specialized sectors such as energy, marine, industry and all related services.



John Glassmire

Senior Advisor, Grid Edge Solutions, Hitachi Energy

John Glassmire is a senior advisor for Grid Edge Solutions at Hitachi Energy. John has extensive experience in the technical and economic potential for energy storage and distributed energy resources to provide clean, low-cost, reliable power. He has led and worked on a wide-variety of energy research and consulting projects including targeted business cases to achieve high use of renewable energy, cost-to-society environmental and economic impacts of clean energy technologies for grid planning, and integrated resource planning for energy infrastructure. His experience is global, ranging from small islands in the Pacific, to isolated Arctic diesel grids, to larger island utilities in the Caribbean, to grid edge technologies in mainland utility networks in Australia, North America, and Europe. An accomplished speaker, he has led training workshops on unlocking the benefits of energy storage and integrating renewables into electrical grids. John also serves as an affiliate instructor in distributed renewable power systems at the University of Washington.



Matt Baker

Director of Microgrids and Critical Power, Typhoon

Colonel Baker (*Retired*), now directs the US business development and operations activities for Typhoon, a small business focused on the design and testing of power electronics and computerized controls. His prior business experience involved microgrid and hybrid energy systems for government customers. A background in Aerospace Engineering combined with a military career spanning 28 years yields a unique and valuable perspective for today's discussion.



Rob Hovsopian

Research Advisor, NREL-ARIES

Rob Hovsopian spent almost 20 years working for General Dynamics, TRW, Northrop Grumman and as an associate scholar scientist / faculty, for the Mechanical Engineering department and program manager at the Center for Advanced Power Systems for the Electric Ship Research and Development Consortium (ESRDC) for the Office of Naval Research.

Currently he serves as Research Advisor at National Renewable Energy Laboratory. Previously he worked as a Scientist/ Department Manager for Power & Energy Systems at Idaho National Laboratory, supporting the Wind and Water program at US Department of Energy in Washington DC. He has been responsible for the successful establishment /deployment of several flexible manufacturing startup facilities globally, working on multiple continents and with many cultures, which produced sophisticated defense electronics equipment, complex automotive systems, and advanced semiconductors. Dr. Hovsopian has personally been recognized nationally for his process improvement activities in manufacturing excellence and currently is actively working on energy systems modeling. He has number of publications in the field of energy systems, thermodynamics optimization, thermal modeling, wind energy, and controls.

He received the M.S. degree in control and the Ph.D. degree in energy systems from the Mechanical Engineering Department, Florida State University

