



NE-IECCE 2026 Special Session (SS-01)

Title of Proposed Session:

Advanced Converter Topologies for Sustainable and Efficient Power Conversion

Technical Outline of the Session

The Special Session on Advanced Converter Topologies for Sustainable and Efficient Power Conversion (ACT-SEPC) focuses on innovations in high-density and energy-efficient power conversion for diverse sustainable applications. It aims to unite researchers, academicians, and industry experts to explore advanced converter architectures and emerging technologies, including but not limited to wide-bandgap (SiC/GaN) devices, digital control, and intelligent optimization. The session emphasizes compact, reliable, and high-performance converter designs for renewable energy systems, electric mobility, battery charging, LED lighting, green hydrogen systems, satellite applications, power banks, and more. Contributions on novel topologies, modelling, control, and implementation are highly encouraged.

Topics of Session

The scope of this Special Session includes, but is not limited to, the following topics:

1. Advanced Converter Topologies and Architectures for sustainable and efficient power conversion.
2. Wide-Bandgap (SiC/GaN) Devices, digital control, and intelligent optimization techniques.
3. High-Power-Density and Reliable Converter Designs for diverse applications (renewable energy, e-mobility, green hydrogen, etc.)
4. Modeling, Control, and Implementation Strategies to enhance converter efficiency and performance.
5. Power Conversion Solutions for emerging applications such as battery charging, LED lighting, satellite systems, and portable power devices.

Special Session Organizers

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Pemendra Kumar Pardhi (Member IEEE) received B.E. degree in electrical and electronics engineering from Mansarovar Institute of Science and Technology, Bhopal, India, M.E. degree in electrical engineering with a specialization in power electronics, and PhD degree in electrical engineering from the Shri Govindram Seksaria Institute of Technology and Science, Indore, India, in 2014, 2017 and 2024, respectively. He received the Young Scientist Fellowship award from the Madhya Pradesh Council of Science and Technology, Bhopal in 2022. He has served to CastNX Pvt. Ltd. for more than two years as a Senior Design Engineer (Power Electronics). Currently, he is working as Assistant Professor in Electrical Engineering Department, NIT Meghalaya, Sohra, India. His research interests include DC-DC converters, control of grid tied solar photovoltaic systems, phase-locked loop, and LED drivers.





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Shailendra Kumar (Senior Member, IEEE) received the M.Tech. and Ph.D. degrees in power electronics, electrical machine and drives (PEEMD) from IIT Delhi, New Delhi, India, in 2015 and 2019, respectively. He was an Assistant Professor with MANIT Bhopal from June 2020 to May 2023. He is currently an Assistant Professor with the Department of Electrical Engineering, IIT Bhilai. His research interests include charging stations for EVs, power quality, grid integration of renewable energy resources, custom power devices, and microgrids.



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Jitendra Gupta (Member, IEEE) received the B.E. degree in electrical and electronics engineering from the Lakshmi Narain College of Technology, Bhopal, India, in 2015, the M.E. degree in power electronics from SGSITS, Indore, India, in 2017, and the Ph.D. degree in power electronics from the Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India, in 2024. He is currently Senior Engineer at AVL. His research interests include electric vehicle battery chargers, power factor correction, dc-dc converters, ac dc converters, high-frequency magnetic design, power quality, and power electronics.

