NE-IECCE 2026 Special Session (SS-10)

Title of Proposed Session:

Energy Policy, Electricity Market Reform, and Demand Side Management for Smarter Distribution Networks

Technical Outline of the Session

This special session focuses on the intersection of energy policy, electricity market reform, and advanced demand-side management to enable smarter, more flexible distribution networks. It will explore modern tariff frameworks, incentive-based pricing, and market restructuring strategies that support load shifting, curtailing, and prosumer participation. Technical discussions will include AI/ML-driven forecasting of renewable energy and EV demand, optimal integration of EV charging and battery swapping stations, and economic planning of DER-rich distribution systems. The session aims to highlight regulatory challenges for DISCOMs, DNOs, and DSOs while presenting innovative tools that enhance reliability, flexibility, and operational efficiency in evolving distribution networks.

Topics of Session

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

1. Electricity Market Reform and Tariff Innovation for Modern Distribution Networks
2. Advanced Demand Side Management: Load Shifting, Curtailing, and Flexibility Enhancement
3. AI/ML-Based Forecasting of Renewable Energy and Electric Vehicle Demand
4. Integration of EV Charging and Battery Swapping Stations in Distribution Systems
5. Regulatory and Policy Challenges for DISCOMs, DNOs, and DSOs in DER-Rich Networks

Special Session Organizers

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Bishwajit Dey (Member, IEEE) received the Ph.D. degree in Electrical Engineering from IIT ISM Dhanbad, India, in 2021. He is currently an Assistant Professor with the Department of Electrical Engineering, Manipal University Jaipur. Prior to this, he was a Postdoctoral Research Fellow at the University of Johannesburg, South Africa, from April to December 2024. He has more than three years of academic and research experience at Adani University, Ahmedabad, and GIET University, Gunupur, Odisha. He has authored numerous publications and has over 1900 Google Scholar citations with an h-index of 24. His current research interests include demand-side management, price-and incentive-based demand response, microgrid energy management with electric vehicles, and power systems optimization.

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Neeraj Kanwar (Senior Member, IEEE) received the B.E. degree in Electrical Engineering from Rajasthan University, Jaipur, India, in 2005, the M.Tech. degree in Power Systems from Malaviya National Institute of Technology (MNIT) Jaipur, India, in 2010, and the Ph.D. degree in Electrical Engineering from MNIT Jaipur in 2017. She is currently an Associate Professor and the Head of the Department of Electrical Engineering at Manipal University Jaipur, India. She has over 20 years of experience in teaching, research, and academic administration. Dr. Kanwar has authored several journal articles, conference papers, and book chapters, and serves as a regular reviewer for high-impact international journals. Her research interests include renewable energy sources, smart grid operation and control, electric vehicles, network reconfiguration, distributed generation, demand-side management, power system planning and operation, and bio-inspired and swarm-based optimization techniques. She has been a member of IEEE since 2014 and an AMIE, IE, since 2011.

3. Aniruddha Bhattacharya
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Aniruddha Bhattacharya (Senior Member, IEEE) is an Assistant Professor with the Department of Electrical Engineering, National Institute of Technology (NIT) Durgapur, India, where he has been serving since December 2018. He previously held faculty positions at NIT Agartala from 2012 to 2018 and at Dr. B. C. Roy Engineering College, Durgapur, from 2011 to 2012. He has authored over 60 SCI/SCIE journal papers and more than 70 international conference papers, and has accumulated 7000+ Google Scholar citations with an h-index of 41. He is currently managing industry and government-funded projects totaling ₹4.5 crores, of which ₹2.2 crores have been completed. His teaching portfolio includes Power System Protection, Power System Operation and Economics, Power System Transients, Power Quality, Power System Dynamics and Control, Circuit Theory, and Power System Planning. His research interests include Power Systems, Microgrid Operations, etc.

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Saurav Raj is an Assistant Professor with the Department of Electrical Engineering, NIT Raipur, India. He previously served as Assistant Professor at the Institute of Chemical Technology, Mumbai – Marathwada Campus, Jalna, and at Alliance University, Bengaluru. He received the B.Tech. degree in Electrical and Electronics Engineering from R.P. Sharma Institute of Technology, Patna, in 2012, and the Ph.D. degree in Electrical Engineering from IIT (ISM) Dhanbad in 2018. He has published 38 journal papers, 10 conference papers, and 8 book chapters, and reviews for leading international publishers including Elsevier, Springer, Taylor & Francis, Wiley, and IEEE. His research interests include renewable energy systems, swarm and evolutionary optimization, intelligent control, stochastic system optimization, power system analysis, FACTS devices, distributed generation, and reactive power planning.