



2025 IEEE 4th International Conference

on

Smart Technologies for Power, Energy and Control (STPEC 2025)

December 10-13, 2025

Department of Electrical and Electronics Engineering,
National Institute of Technology Goa, Goa, India



Special Session 13 (SS13)

Advancing Solar Photovoltaics: From Smart Design to Sustainable Deployment

Organized and co-chaired by:

- Dr. Chirodeep Bakli, IIT Kharagpur, India
- Dr. Manish Kumar, HP University Shimla, India
- Dr. Prashant Malik, Swaniti Initiative New Delhi, India

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Call for Papers

• Technical Outline of the Session:

The session will address the latest innovations and challenges in solar PV technology. It will cover advancements in system design, reliability, grid integration, and policy frameworks supporting sustainable deployment. The session opens with the role of solar PV in the clean energy transition, highlighting improvements that boost efficiency and adaptability for rooftop, utility-scale, and Building Integrated Photovoltaics (BIPV). Focus areas include strategies to enhance reliability, minimize degradation, and apply AI-based monitoring for predictive maintenance. Integration challenges—such as smart inverters, energy storage, and AI models for grid stability—will be discussed. Policy, lifecycle impacts, recycling, and sustainability will also be addressed, concluding with future prospects for PV in global climate goals and resilient energy grids.

• Topic of the Session includes, but are not limited to:

- Solar PV System Design
- Reliability and Degradation of PV Systems
- Energy Storage Solutions for Seamless PV-Grid Integration
- Addressing Intermittency and Stability in Solar PV with AI and Machine Learning
- Building Integrated Photovoltaics (BIPV) and Urban PV Applications
- Policy and Regulatory Frameworks: Incentives, Standards, and Market Development
- End-of-Life (EoL) Analysis: Recycling, Reuse, and Circularity in PV Deployment
- Environmental Impact, Recycling, and Sustainability of PV Systems

• Important Dates:

- Special Session Paper Submission Due : June 15, 2025
- Notification of Paper Acceptance : July 31, 2025
- Camera Ready Paper Submission Due : August 31, 2025
- Regular Registration Due : October 30, 2025

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