

**International Conference on
Sustainable Energy Technologies and Computational Intelligence
(SETCOM 2025)
Department of Electrical Engineering, SoET
Pandit Deendayal Energy University (PDEU), Gandhinagar, Gujarat,
India |**

February 21 – 23, 2025



SETCOM 2025 Special Sessions on

**“Reforming the Electric Power System Infrastructure for Enhancing
Sustainability Using Energy Technologies and Computational
Intelligence”**

Aims & Scope of the Session (100-200 words):

The current power system infrastructure faces significant challenges, including a heavy reliance on non-renewable energy sources, outdated grid technologies, and inadequate sustainable development initiatives. These issues contribute to environmental degradation and energy inefficiency, hindering the widespread adoption of sustainable practices. Addressing these challenges requires a multifaceted strategy involving the implementation of smart grid technologies, upgrades to distribution systems, and grid expansion.

The special session titled "*Reforming the Electric Power System Infrastructure for Enhancing Sustainability Using Energy Technologies and Computational Intelligence*" focuses on integrating advanced technologies to revolutionize the power grid. Key areas of emphasis include deploying smart meters, advanced distribution management systems, and grid automation to optimize energy flow, enhance demand forecasting, and seamlessly integrate renewable energy sources. Upgrading transformers, feeders, and distribution lines with advanced materials can reduce energy losses and improve reliability. Expanding transmission networks, especially in rural areas, aims to connect remote communities and ensure equitable access to clean electricity.

Facilitating the adoption of solar, wind, and hydropower through capacity additions, streamlined permitting processes, and innovative financing models is essential to decarbonize the electricity mix. Implementing energy storage solutions like battery storage and pumped hydro addresses the intermittency of renewables and stabilizes the grid. Developing microgrids and mini-grids provides sustainable electricity access to off-grid and underserved communities through localized energy systems.

In addition to technological advancements, the session underscores the importance of establishing robust policies and practices. Focusing on cybersecurity measures protects the energy infrastructure against cyber threats. Implementing regulatory reforms incentivizes the adoption of clean energy solutions, while investing in capacity building develops a skilled workforce to support the evolving energy sector. The purpose of this session is to explore pathways toward a sustainable and secure energy future, highlighting the critical role of technological innovation, supportive policy frameworks, and active public engagement in transforming the power system infrastructure.

Topics of interest include, but are not limited to:

• **Smart Grid Technologies**

- Implementation of smart meters
- Advanced distribution management systems
- Grid automation and optimization

• **Grid Infrastructure Upgrades**

- Upgrading transformers and feeders
- Use of advanced materials in distribution lines
- Strategies to reduce energy losses and improve reliability

• **Renewable Energy Integration**

- Solar, wind, and hydropower adoption
- Capacity addition and scaling of renewable sources
- Streamlined permitting processes for renewables
- Innovative financing models for clean energy projects

• **Energy Storage Solutions**

- Battery storage technologies
- Pumped hydro storage
- Addressing intermittency of renewable energy sources
- Grid stabilization techniques

• **Microgrids and Mini-grids Development**

- Design and implementation of localized energy systems
- Sustainable electricity access for off-grid communities
- Integration of microgrids with the main grid

• **Grid Expansion and Accessibility**

- Transmission network expansion in rural areas
- Connecting remote communities
- Equitable access to clean electricity
- **Computational Intelligence in Energy Systems**
 - AI and machine learning for demand forecasting
 - Predictive maintenance of grid infrastructure
 - Optimization algorithms for energy distribution
- **Cybersecurity in Energy Infrastructure**
 - Protecting against cyber threats
 - Secure communication protocols for smart grids
 - Risk assessment and management strategies
- **Regulatory Reforms and Policy Development**
 - Policies incentivizing clean energy adoption
 - Regulatory frameworks for grid modernization
 - Legal aspects of energy distribution and consumption
- **Capacity Building and Workforce Development**
 - Training programs for energy sector professionals
 - Educational initiatives on sustainable technologies
 - Skill development for emerging energy technologies
- **Advanced Materials and Technologies**
 - Innovation in conductive materials
 - Development of sustainable and durable grid components
 - Nanotechnology applications in energy systems
- **Energy Efficiency Measures**
 - Demand-side management strategies
 - Energy-efficient appliances and systems
 - Consumer engagement and behavior change initiatives
- **Public Engagement and Awareness**
 - Community involvement in energy projects
 - Educational campaigns on sustainability
 - Stakeholder collaboration and partnerships
- **Innovative Financing and Economic Models**
 - Funding mechanisms for sustainable projects
 - Public-private partnerships
 - Economic incentives for renewable energy adoption
- **Environmental Impact and Sustainability**
 - Assessing the ecological footprint of energy systems
 - Strategies for reducing greenhouse gas emissions
 - Life-cycle analysis of energy infrastructure

Special Session Organizers (names and contact emails):

Organizer 1:

Name: Dr. CHANDAN KUMAR SHIVA

Institutional e-mail: Chandan.kumar@sru.edu.in

Affiliation: Department of Electrical and Electronics Engineering, SR University, Warangal, India, 506371

Fields of interest: Automatic generation control, Micro-grid, evolutionary algorithms, and renewable energy

Institutional home page:

<https://sru.edu.in/faculty/FacultyProfile/ecd58ea81c7b4a44209bba17c5fde09217817d96f7dc5085bc016a73032fd20d7467e869744557bb2e3e628ed1b7c42f82fb03c3e66b966143c10065d2923a4bhemMWWIYaCnXHe.IJ8Cd85.qoT5YHKQdUSEHa3jE3Nk->

Organizer 2:

Name: Dr. SACHIDANANDA SEN

Institutional e-mail: s.sachidananda@sru.edu.in

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Fields of interest: Microgrids, smart cities, smart grid, control system, Electric Vehicles, and cyber security.

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<https://sru.edu.in/faculty/FacultyProfile/730315b8d08b16934c2832ab6c796c6bf8c6039c1c8d68513523d5207a0ef3ff03a875297ba21dc70d181bf4347c8d08858d50b53b07fe44d4004066898f94aefTGEyFtWnAtWm9DOvSCTgKf7yyCTJPoXihSgb0wCWZc->

Special Session Organizers (short bios with photo):



Brief Bio: Dr. Chandan Kumar Shiva is currently an Esteemed Associate Professor in the Department of Electrical and Electronics Engineering at SR University, located in Warangal, Telangana, India. He pursued his Ph.D. in the field of Electrical Engineering, specializing in Power System Engineering, from the prestigious Indian Institute of Technology (Indian School of Mines) in Dhanbad, Jharkhand, successfully completing his doctoral studies in 2018. His areas of expertise encompass Engineering Optimization and Power System Analysis, reflecting his deep knowledge and commitment to these subjects. His major areas of research interests include AI techniques, optimization techniques, control system techniques, AGC/LFC in different structures of power systems, energy storage systems and renewable energy systems. He has published 55 research papers in reputed international journals. He has published 25 SCIE papers, and 12 Emerging SCI papers. He has Google Scholar citations of 1159-plus and h-index of 22 and i10-index 32. He has been placed among “Top 5% of Researchers in the India” for 2019, 2020, and 2021 by AD Scientific Index 2023 by Stanford University, Moreover, Dr. Chandan Kumar Shiva has actively participated in the academic community by undertaking the role of a reviewer for various impactful journals. He also contributed as a Technical Program Committee member and Session chairperson at reputedly organized conferences.



Dr. Sachidananda Sen completed his B.Tech in Electrical and Electronics Engineering from GITA, Bhubaneswar in 2011. Then he worked in Industry for a year then went for master's in engineering (ME) in Control Systems specialization from Indian Institute of Engineering Science and Technology (IEST), Shibpur, Kolkata in 2015 and completed Ph.D. from Indian Institute of Technology (IIT) Roorkee in Electrical Engineering in 2020. He is currently working as Assistant Professor in the Department of Electrical and Electronics Engineering at SR University, Warangal and also holds the post of Assistant Dean Research. His research interests include Microgrids, Control systems design, Electric vehicles, Smart grid, and Sustainable development. He has published more than 40 International Journals, Book chapters, and Conferences. And he is an active reviewer for many reputed international journals and chaired several technical sessions for International Conferences. He has Google Scholar citations of 585-plus, i-10 index of 10 and h-index of 10.