

Emerging Operational Challenges in Energy Communities

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Energy communities are moving from conceptual designs and pilot initiatives toward real implementation and operation in different regulatory and market contexts. As these communities begin to operate, new challenges and opportunities emerge that extend beyond initial theoretical models, design assumptions, and feasibility studies. This special session focuses on the practical, organizational, and operational aspects that arise once energy communities start functioning in real-world conditions.

The session aims to explore how energy communities manage energy production, consumption, and sharing, as well as how benefits are allocated among participants. Particular attention is given to the interplay between technical solutions, user behavior, data availability, and regulatory frameworks. The objectives include analyzing early operational experiences, identifying barriers and enabling factors, comparing different community models, and discussing future research directions to support the sustainable development and scalability of energy communities.

Topics of interest of this special session include, but are not limited to:

- **Grid integration and operational management in energy communities.**
- **Distributed energy resources and local flexibility.**
- **Energy production and consumption patterns in operational communities.**
- **Energy sharing mechanisms and benefit allocation strategies.**
- **Management, governance, and organizational models.**
- **Role of user behavior, engagement, and participation in community performance.**
- **Data management, monitoring, and digital platforms.**
- **Economic and environmental assessment of energy community initiatives.**
- **Regulatory and market frameworks affecting deployment.**
- **Lessons learned from pilot projects and early-stage implementations.**
- **Scalability and replication of community models.**

All the instructions for paper submission are included in the conference website www.eeeic.net

