

Special Issue

Towards Smart and Flexible Distribution Grids: Enhancing Hosting Capacity and Energy Sharing in Decentralized Energy Systems

Message from the Guest Editors

The energy transition is transforming electricity distribution networks. The integration of Renewable Energy Sources (RESs), expansion of Electric Vehicle (EV) charging, and rise of Renewable Energy Communities (RECs) are shifting the traditional energy paradigm. These developments bring new challenges such as congestion, variability, and bidirectional power flows. This Special Issue focuses on the evolving role of distribution networks in supporting decentralized, renewable energy systems. A key theme is *hosting capacity*—the ability of networks to accommodate RESs and EVs without compromising reliability. We invite contributions on modeling, control, planning, and real-world solutions for smart and flexible grid management. Topics include:

- Energy management for microgrids, RECs, and EV hubs
- EV charging coordination and Vehicle-to-X strategies
- Flexibility and demand-side optimization
- Grid-supportive distributed energy resources
- Innovative methods to assess and enhance hosting capacity

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Message from the Editor-in-Chief

Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

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