Special Issue

Advancing Energy Systems for a Decarbonized Future: Renewable Integration, Smart Grids, and Optimization Strategies

Message from the Guest Editors

The transition to a decarbonized society necessitates a comprehensive transformation of energy systems, driven by the increasing penetration of renewable energy sources and energy storage systems (ESSs). To address emerging challenges and opportunities, the integration of artificial intelligence and big data analytics is enabling smarter grid management, enhanced demand-side flexibility. Moreover, advanced control strategies, energy storage optimization, and distributed energy resources (DERs) are crucial for ensuring grid reliability and resilience, while microgrids solutions enhance energy accessibility. The expansion of electricity markets calls for innovative pricing models and financial incentives to accelerate renewable energy adoption, paving the way for a more sustainable and resilient net-zero energy future. This Special Issue discusses the following topics:

- Implementation of Net-Zero Energy Systems;
- Renewable Energy Integration and Optimization;
- Smart Grids and DERs;
- Advanced Control Strategies, AI and Big Data Applications in Power Systems;
- ESSs and Demand Response;
- Pricing Mechanisms for Promoting Renewable Energy;
- Operational Strategies for Microgrids;

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Message from the Editor-in-Chief

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