Special Issue

Challenges and Research Trends of Integrated Zero-Carbon Power Plant

Message from the Guest Editors

This Special Issue aims to serve as a comprehensive resource for academics, engineers, and policymakers working towards the development of integrated zero-carbon power systems. **Scope and Themes**

- **Renewable Energy Integration**: Advanced methods for harmonizing intermittent renewables (e.g., solar, wind) using grid stability, including hybrid energy storage systems and demand-side management.
- **Carbon Capture and Utilization (CCUS)**: Novel materials, processes, and system-level strategies for integrating CCUS into power plants.
- **Smart Grid and Digitalization**: Advanced smart grid technologies, such as AI-driven optimization, IoT-enabled monitoring, and blockchain applications, for energy trading and transparency.
- **Industrial Energy Efficiency and Demand Responses**: Innovations in industrial and commercial load management and demand responses to reduce carbon footprints, especially in energy-intensive sectors.
- **AI-Driven Innovations in Energy Systems**: The application of artificial intelligence (AI) for predictive maintenance, energy forecasting, load disaggregation, and system optimization. Techniques such as deep learning, reinforcement learning, and LLM are of particular interest.

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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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