

Special Issue Reprint

Modeling, Design and Engineering Optimization of Energy Systems

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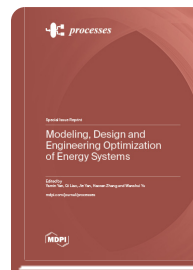
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This Reprint compiles cutting-edge research on modeling, design, and engineering optimization for sustainable energy systems. It addresses critical global challenges—climate change mitigation, renewable integration, and efficiency enhancement—through innovative methodologies and computational tools. Key themes in this collection include the following: Energy Storage and Conversion: Optimization of electrochemical/hybrid storage to balance renewable variability, bolster grid resilience, and quantify environmental benefits. Hydrogen and Fuel Cells: Advances in green hydrogen systems, including integrated power-to-gas with fuel cells, autonomous operation, carbon-trading incentives, and flexible cogeneration. AI-Driven Optimization: AI applications for precision carbon management, adaptive system reconfiguration, and risk-informed decision-making under uncertainty. Renewable Integration: Smart strategies for improving renewable penetration, featuring spatiotemporal modeling of EV mobility, cost-minimized charging infrastructure, and demand-side management. The contributions highlight co-optimization frameworks that minimize costs/emissions while enhancing reliability. This collection paves the way for low-carbon transitions in the power, transportation, and industrial sectors through interdisciplinary engineering solutions.

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