

Special Issue

Advanced Low-Carbon Energy Processes: Engineering, Optimization, and System Integration for Carbon Neutrality

Message from the Guest Editors

The global pursuit of carbon neutrality has spurred an urgent demand for innovative low-carbon energy technologies and integrated systems. Addressing climate challenges requires synergistic advancements in renewable energy utilization, traditional energy decarbonization, and carbon management. This Special Issue aims to provide a platform for showcasing cutting-edge research on low-carbon energy systems, focusing on technologies that enhance efficiency, reduce emissions, and accelerate the transition to net-zero carbon. Topics of interest include, but are not limited to, the following:

- Renewable energy (wind, solar, and biomass) and advanced energy storage solutions;
- Decarbonization of traditional energy systems (e.g., natural gas liquefaction with high-efficiency heat exchange);
- Carbon capture, utilization, and storage (CCUS), including integrated CO₂ capture and utilization (ICCU);
- Hydrogen energy technologies (e.g., hydrogen combustion engines);
- Biomass conversion (e.g., biomass chemical looping gasification and pyrolysis–steam reforming);
- Low-carbon energy materials and integrated smart energy systems.

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