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Special Issue Reprint

# Sustainable and Low Carbon Development in the Energy Sector

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This Reprint serves as a comprehensive, transdisciplinary platform for analyzing the global energy transition. The collection of seventeen articles frames the shift toward a low-carbon economy as a complex challenge that requires integrated solutions across physics, economics, and sociology. The theoretical foundation of the volume combines rigorous physical evaluations with advanced economic modeling. Authors apply the laws of thermodynamics and material entropy to assess future technologies, alongside entropy-based econometrics for regional forecasting. These technical perspectives are balanced by sociological investigations into the contact zones between citizens and administration, addressing the governance of prosumer capitalism.

On a practical level, the issue delivers diverse sectoral applications. In transportation, research utilizes hybrid deep learning to predict electric vehicle charging demand. The agricultural sector is examined through strategies for the adoption of Fossil-Energy-Free Technologies (FEFTS) and the economics of organic farming. Further contributions focus on grid stability by integrating hydropower into resource adequacy assessments and optimizing feed-in tariff policies for households. By merging theoretical depth with operational case studies, this volume offers a holistic roadmap for navigating the technical and social intricacies of decarbonization.

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