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Editorial for special issue of *Science and Technology for Energy Transition* (ISSN: 2804-7699) collection of research articles selected from the 7th International Symposium on Hydrogen Energy, Renewable Energy, and Materials (HEREM) 2021

A multifaceted approach to energy transition: technological innovations

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The transition to a sustainable energy future necessitates a multifaceted approach encompassing policy, economic, and technological dimensions. This special issue of Science and Technology for Energy Transition (ISSN: 2804-7699) presents a collection of research articles meticulously selected from the 7th International Symposium on Hydrogen Energy, Renewable Energy, and Materials (HEREM) 2021. These articles illuminate the pivotal role of technological advancements in accelerating this transformation.

The featured articles highlight the intricate challenges and promising opportunities within the modern energy landscape. They provide valuable insights into key aspects of energy systems, including the spatial dynamics of renewable energy deployment.

One of the paramount challenges in achieving a sustainable energy future is the development of dependable and efficient technologies capable of harnessing diverse energy sources. The article by Qian *et al.* [1] (DOI: https://doi.org/10.2516/stet/2022013) emphasizes the significance of accurate and robust measurement techniques for optimizing energy conversion processes, focusing on the inverse estimation of wall temperature measurement under dispersion medium shielding. Such advancements are instrumental in enhancing the performance and safety of energy systems, particularly in high-temperature settings.

Another critical facet of the energy transition involves the spatial optimization of renewable energy resources. The study by Lv *et al.* [2] (DOI: https://doi.org/10.2516/stet/2022007) on the spatial evolution of the energy industry in Hebei province offers valuable insights into the factors driving the shift from fossil fuels to renewable energy sources. Understanding these spatial dynamics is essential for formulating effective policymaking and investment strategies to maximize the benefits of renewable energy while minimizing potential environmental repercussions.

The article by Zhu *et al.* [3] (DOI: https://doi.org/10.2516/stet/2022005) explores the oiling low-temperature separation process for natural gas dehydration and de-hydro carbonization, showcasing the potential of innovative process engineering to augment energy efficiency and reduce environmental impacts. By addressing the specific challenges associated with certain types of natural gas, this research contributes to the development of more sustainable and dependable energy supply chains.

Furthermore, the exploration of solid carbonate-oxide composite materials for low-temperature solid oxide fuel cells presents a promising avenue for advancing energy storage and conversion technologies [4] (DOI: https://doi.org/10.2516/stet/2022003). The development of efficient and durable materials for such devices is paramount for enabling the widespread adoption of fuel cell technologies across various applications.

Finally, the analysis of industrial characteristics and spatial aggregation patterns of renewable energy in the Beijing-Tianjin-Hebei region by Wu *et al.* [5] (DOI: https://doi.org/10.2516/stet/2022002) provides valuable insights into the regional dynamics of the energy transition. Understanding these patterns can inform strategies for fostering regional cooperation and collaboration in the development of renewable energy infrastructure.

The articles presented in this special issue collectively demonstrate the rapid advancements in energy-related research and development. By addressing critical challenges such as accurate measurement, efficient energy conversion, and spatial optimization, these studies contribute significantly to the development of innovative technologies and strategies for a sustainable energy future. We believe that the research presented here will inspire further

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advancements in the field and contribute to the global effort to mitigate climate change and establish a resilient energy system.

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