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Editorial

Climate Change and the Impacts on Power and Energy Systems

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This collection, extracted from the Special Issue "*Climate Change and the Impacts on Power and Energy Systems*", features ten papers that address key topics related to the resilience and adaptation of electrical power and energy systems in response to climate change. Among the ten published papers, three are review papers [1–3] and the remaining seven are research articles [4–10], with the final paper authored by the Guest Editorial team.

The following is a brief summary of these papers, intended as a reference for readers of this collection.

With rising greenhouse gas emissions, the thermal demands of buildings are increasingly tied to climate conditions. Raimundo and Oliveira [4] examine Heating, Ventilation, and Air Conditioning (HVAC) energy requirements for various building types in Mediterranean climates, finding that energy efficiency can be enhanced through the strategic use of insulation and shading. Buonanno et al. [5] investigate photovoltaic (PV) energy forecasting using machine learning and weather models, demonstrating that linear models can effectively refine predictions when data are limited. Gómez-Beas et al. [6] utilize stochastic flow analysis to optimize mountain-based run-of-river hydroelectric plants, revealing that the impacts of rainfall can be mitigated with storage solutions to significantly enhance operational efficiency.

Osawa [7] evaluates residential energy configurations incorporating a bidirectional Electric Vehicle (EV) power supply, suggesting that battery storage and Vehicle-to-Home (V2H) systems reduce emissions and improve cost-effectiveness, particularly for households with variable parking durations. Tratnik and Beković [8] analyze the impact of Slovenia's abolition of net metering, finding that aggregators and battery storage enhance cost savings and energy self-sufficiency in the absence of net metering. Wang et al. [9] conduct a land eligibility study related to Greece's decarbonization efforts, concluding that solar installations have a greater potential impact than wind installations, despite spatial limitations.

In Scandinavia, particularly Norway and Sweden, Mohammadi et al. [10] explore the potential impacts of climatic indices, such as the North Atlantic Oscillation (NAO) and the Atlantic Meridional Overturning Circulation (AMOC), on winter temperatures. They assess how these impacts influence electrical power systems, specifically in terms of renewable energy generation and increased power demands during colder winters. Cooper et al. [1] review anomaly detection in power system state estimation, discussing the potential of Artificial Intelligence (AI) and data-driven approaches to meet the evolving needs of future smart grids. Ekonomou and Menegaki [2] focus on building energy usage, emphasizing the need to transform energy systems by employing sustainable practices to withstand climate impacts. Finally, Moriarty and Honnery [3] critically evaluate both conventional and geoengineering solutions to prevent catastrophic climate change, stressing the urgency of reducing global consumption through accelerated policy measures.

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Citation: Mohammadi, Y.; Polajžer, B.; Palstev, A.; Khodadad, D. Climate Change and the Impacts on Power and Energy Systems. *Energies* **2024**, *17*, 5403. https://doi.org/10.3390/en17215403

Received: 28 October 2024
Revised: 29 October 2024
Accepted: 29 October 2024
Published: 30 October 2024

In summary, this Special Issue collectively underscores the critical need for adaptable, resilient power and energy systems, along with innovative climate strategies, to ensure energy sustainability amid escalating climate challenges. We extend our gratitude to the Academic and Managing Editors, as well as the reviewers, for their valuable contributions. Editing these papers has been a rewarding experience. Given the breadth and importance of this topic, we are pleased to present a second edition, titled "*Climate Change in Power and Energy Systems: Challenges, Innovations, and Solutions*", and look forward to continued contributions from researchers worldwide.

Author Contributions: Y.M., B.P., A.P. and D.K.; writing—review and editing. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by the Kempe Foundation (*Kempestiftelserna*) (https://www.kempe.com/, accessed on 1 November 2022), grant (funding) number JCK22-0025.

Conflicts of Interest: The authors declare no conflict of interest.

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