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Editorial

Offshore Renewable Energy

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1. Introduction

Offshore renewable energy is an abundant clean energy source that includes offshore solar energy, offshore wind power, wave energy, ocean thermal energy conversion (OTEC), and tidal energy. These energy forms have the characteristics of abundant resources, a wide distribution, no occupation of land space, sustainable utilization, and relatively small environmental impact, and are important directions for the global response to climate change and promoting energy transformation. Compared with terrestrial renewable energy, offshore renewable energy has irreplaceable advantages [1–3]. On the one hand, offshore renewable energy has abundant reserves, high energy density, and is suitable for large-scale and centralized development, which plays a more significant supporting role in the development of the coastal economy. On the other hand, the multi-level distribution characteristics of different forms of marine energy are more obvious, and diversified energy development and utilization can be carried out [4–6].

At present, the development of offshore wind power technology is relatively mature and has entered the stage of large-scale development. With advancements in technology, the scale and efficiency of offshore wind turbines are constantly increasing and the cost is gradually decreasing, making offshore wind power more competitive. Meanwhile, other forms of marine energy such as offshore photovoltaic power, tidal current energy, and wave energy are also actively being researched and developed [7–9]. Although their commercialization level is not as high as that of offshore wind power, technological progress and cost reductions are driving these energy forms to gradually enter the market. The complex marine environment poses greater challenges to the development and utilization of renewable energy at sea. Due to the harsh marine environmental conditions, offshore renewable energy development platforms need to have better corrosion resistance and wind and wave resistance, which leads to difficulties in platform construction as well as operation and maintenance. In addition, the development of offshore renewable energy has an impact on the ecological environment, such as marine pollution and ecological damage. Effective measures need to be taken to prevent and control such impacts.

In summary, offshore renewable energy is in a rapid development stage, but it is worth noting that, with the development and gradual maturity of various technologies, offshore renewable energy will become the mainstream new energy in the future.

2. An Overview of the SI and Published Articles

Aiming to provide updates regarding the development and utilization of offshore renewable energy, the *Journal of Marine Science and Engineering (JMSE)* proudly presents this SI, entitled "Offshore renewable energy". The SI aims to provide updates regarding novel

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concepts, control strategies, modeling methods, intelligent equipment, and monitoring technology applications.

This SI discusses the key technologies of the offshore renewable energy system: a behavior analysis of the Bucket Foundation (BF) with an offshore wind turbine during the in-water sinking process (contribution 1); the mooring design of floating wind turbines (contribution 8); wave energy converters (contributions 2 and 7); ocean thermal energy conversion (contribution 4, contribution 11); the performance analysis of a floating wind–wave power generation platform (contribution 6); and the tidal stream turbine attachment fault detection method (contribution 3). The AD-LADRC circulation suppression strategy is proposed based on the traditional circulation suppression scheme (contribution 5) in order to improve the circulation suppression effect, increase the stability of high-voltage direct-current (HVDC) transmission systems, and provide certain theoretical and application support for the subsequent development and large-scale utilization of offshore wind power. Additionally, this SI discusses the suitable installation position and the optimum strut height of T-foil for an offshore wind power operation and maintenance vessel. A longitudinal control system for ship multiple-degrees-of-freedom-coupled motion is established for severe sea states (contribution 10). A novel three-DOF turbine access system (TAS) with active motion compensation for the Fujian coastal area is designed. A proposed new stacking compensation algorithm and a fuzzy controller with feedforward compensation are used to achieve TAS end position compensation (contribution 9). An electromagnetic generator with a circular structure is proposed (contribution 7) that can quickly charge capacitors and light up LED lights under various sea conditions. It has the ability to provide power for small ocean monitoring equipment and has good application prospects. These studies provide valuable insights for the development and application of offshore renewable energy.

3. Conclusions

We sincerely thank the *Journal of Marine Science and Engineering (JMSE)* for inviting us to collaborate in creating the SI "Offshore Renewable Energy", and the authors for providing high-quality papers. Firstly, we would like to express our sincere gratitude to the reviewers. They carefully reviewed the content of the paper with a rigorous scientific attitude and provided insightful criticism and guidance. Their strict requirements for the quality of the paper and suggestions for further improvement have enabled us to examine our research more deeply and enhance the scientific approach of the article. Their in-depth review and constructive modification suggestions have deeply inspired us. Secondly, we would like to express our deepest gratitude to the diligent editors. They not only carefully reviewed and revised our paper with professional insight, but also provided many valuable suggestions with selfless spirit and patience. Their organization and optimization of the structure and language of the paper have improved the fluency of our article. Meanwhile, their guidance and assistance during the paper revision process benefited us greatly. Finally, we would like to thank the editors and reviewers for providing us with professional knowledge and technical support. Their knowledge and experience have enabled our paper to be improved and perfected at a higher level. Thank you again to all of the professionals who participated in the development of this Special Issue. Your hard work and selfless dedication have laid a solid foundation for the successful publication of this SI. We sincerely hope that, in the future, we can continue to work together to promote the progress and development of research related to offshore renewable energy.

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List of Contributions

1. Ye, F.; Lian, J.; Xiao, T.; Xiong, D.; Wang, H.; Guo, Y.; Shao, N. Behavior Analysis of a Bucket Foundation with an Offshore Wind Turbine during the In-Water Sinking Process. *J. Mar. Sci. Eng.* **2024**, *12*, 494. https://doi.org/10.3390/jmse12030494.
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