

Editorial

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Energy continues to be one of the most important aspects and challenges of our existence, and the focus on renewable energy from natural resources is expected to continue to increase over the next decades. While there is a general consensus on trying to use renewable energy by harnessing natural resources like wind and waves, there is a wide variability and choice in terms of implementation. Significant research is required for many burgeoning opportunities around renewable energy to de-risk the sector and make it commercially competitive. This themed issue on ocean/wave energy is representative of how some of these challenges can be addressed. In particular, the issue considers various stages of such innovation, encompassing viability of novel renewable energy solutions, their design and, subsequently, their performance. Combined, the papers in this themed issue provide an insight into how various stages of development of new ideas around renewable energy can be better assimilated through focused research.

Ergul and Ozbek (2022) present a wave energy site and converter selection process using multi-criteria decision making. To this effect, a case study is presented for Turkey and a two-phased multi-criteria decision making structure is presented for the selection of wave energy converters. Site selection and prioritisation on the Black Sea coast is demonstrated through this paper and the method presented can be adapted for other sites as well.

The need for developing novel technologies for niche requirements is subsequently highlighted by Masters *et al.* (2022). There is a focus on open-source design, which provides communities in remote areas with better access to the development of such technologies, including the possibilities of quantifying

power generation in a reasonable manner. Formal design, analysis and laboratory tests are presented for a novel axial flow hydro-kinetic turbine that can be built and maintained using minimal equipment, with components that can be readily obtained (Figure 1). Results demonstrate how an effective water turbine with a 3 kW output can be theoretically produced and maintained without an over-reliance on specialised components and tools.

Finally, Wang (2022) presents a performance analysis study for coastal wave energy converters, with a focus on robustness. Numerical simulations present the influences of the bottom effects on the performances of coastal wave energy converters. A transformed linear simulation approach relates the non-Gaussian process and the original Gaussian process based on the equivalence of the level up-crossing rates of the two processes, with the level up-crossing rate calculated by an asymptotic analysis approach. The performance of this approach is subsequently investigated.

It is apparent from the focus of this issue that there is a need for creating extensive evidence bases around new ideas from different aspects for their evolution and competitiveness. Significant and sustained research of this nature can connect decision making, technology and assessment in a cohesive manner, which will make new technologies in the wave energy sector progressively more competitive as compared to the traditional sources of energy from fossil fuels, as well as the more established renewable energy sources, like wind.

Energy continues to publish high-quality and practical work in this important area and expects to impact this theme of

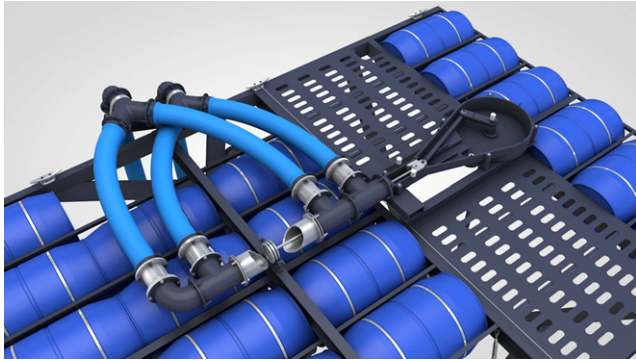


Figure 1. Renders of final power take off design offshore – with cut outs and lid removed

research in 2022, as the number of papers we receive grows steadily. Coupled with Ahead of Print articles, we anticipate a growing success of this journal in the coming years.

REFERENCES

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