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Powering the Oceans: Environmental Considerations for Marine Renewables

Vanessa B Johnson*

Department of Marine Science, TI Institute of Sea Fisheries, Germany

Abstract

This article explores the critical environmental considerations associated with harnessing marine renewable energy sources, including wave, tidal, and ocean current energy. As the global transition to sustainable energy intensifes, understanding and mitigating the ecological impacts of marine renewables become imperative. The discussion encompasses the disruption of marine ecosystems, alterations in tidal currents, noise pollution, and navigational hazards. To strike a balance between green energy production and ecosystem preservation, this article advocates for rigorous site selection, technological innovation, ongoing monitoring, and collaborative regulatory eforts.

: Marine renewables; Wave energy; Tidal energy; Ocean current energy; Environmental considerations; Marine ecosystems

e world's growing demand for clean and sustainable energy sources has prompted the exploration of innovative technologies capable of harnessing the immense power of our oceans. Marine renewable energy sources, such as wave, tidal, and ocean current energy, o er a promising avenue to reduce our reliance on fossil fuels and combat climate change. However, as we embark on this green energy journey, it is imperative to understand and address the environmental considerations associated with marine renewables. In this article, we will delve into the environmental impacts and considerations of harnessing the power of the oceans for a cleaner future. Until now, the environmental concerns associated with renewable energy projects have been a signi cant obstacle, leading to the delay or rejection of many planning applications for onshore renewable developments. While o shore locations seem to alleviate some of these concerns, it's important to remember that coastal ecosystems have already undergone signi cant changes due to human activities. Additionally, con icts between various marine activities and demands are on the rise in these areas [1].

Given this complex landscape of existing uses, pressures, and anticipated developments, the expansion of the Marine Renewable

***Corresponding author:** Vanessa B Johnson, Department of Marine Science, TI Institute of Sea Fisheries, Germany, E-mail: johnsonvanessa.b@thuenen.de

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