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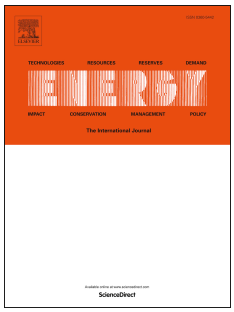

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V. Ramos, M. López, F. Taveira-Pinto, P. Rosa-Santos

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Influence of the wave climate seasonality on the performance of a wave energy converter: A case study

V. Ramos[a,*], M. López[b], F. Taveira-Pinto[a], P. Rosa-Santos[a]

[a]*Interdisciplinary Centre of Marine and Environmental Research (CIIMAR), Faculty of Engineering, University of Porto (FEUP), rua Dr. Roberto Frias, s/n, 4200-465 Porto, Portugal*

[b]*Deparment of Construction and Manufacturing Engineering, University of Oviedo, EPM, C/ Gonzalo Gutiérrez Quirós, s/n, 33600 Mieres-Asturias, Spain*

Abstract

CECO is a novel Wave Energy Converter (WEC) concept, which has shown promising results in previous studies. The present work focuses on assessing the performance of CECO for a 11-year horizon in relation to the characteristics of the wave climate (intra and inter-annual seasonal variations) by means of two performance indicators defined *ad hoc*: Captured Energy (CE) and Captured Energy Efficiency (CEE_{ff}). For this purpose, the CECO matrix of absorbed wave power was constructed for an operating water depth of 30 m using the panel-based model ANSYS®-AQWA™. The Atlantic coast of the Iberian Peninsula, which presents a highly seasonal and energetic wave climate, was used as case study. Overall, it was found that CECO is able to capture large amounts of wave energy, especially for milder wave conditions, with values of CEE_{ff} exceeding 40 %. However, for harsher wave conditions the results of CEE_{ff} decrease considerably ranging from 10% to 20%, which may result from the current design of CECO. In this context, the results obtained offer some valuable insight into the future evolution of CECO with the purpose of addressing the limitations of the current design and to optimise its performance according to the wave conditions for specific locations.

Keywords:
CECO, WEC, Iberian Peninsula, NAO, AQWA, Captured Energy Efficiency

*Corresponding author
Email address: jvrc@fe.up.pt (V. Ramos)