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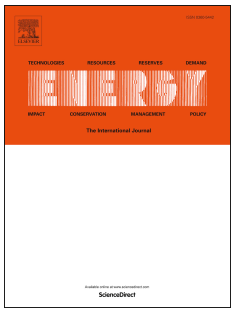

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An integrated approach for the installation of a wave farm

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Abstract

The installation of a wave farm involves the appropriate selection of a location and a wave energy converter (WEC) for harnessing the energy resource. There is typically a considerable number of options both regarding the site and the technology, and choosing the optimum WEC-site combination is not straightforward. An integrated approach is demonstrated in this work by means of a case study in Burela (Galicia, NW Spain)—an area that has been proposed for wave energy exploitation. First, three possible locations are defined with a view to avoiding potential environmental impacts and the interference of the wave farm with existing uses of the marine space. Then, the power performance of six technologies at the selected locations is computed by means of a comprehensive methodology based on high-resolution numerical modelling, which guarantees accurate and reliable results. Significant spatial variability of the resource over short length scales is found, which translates into large variations in the performance of the various WECs considered. On this basis, the most appropriate site and WEC for the area are determined, thereby the integrated approach for installing a wave farm—which may be used in any other region of interest—is demonstrated.

Keywords: power performance; high-resolution modelling; ICZM; WEC-site combination.

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