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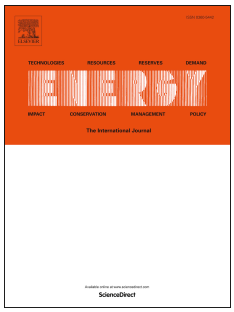

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Economic-Financial Modeling for Marine Current Harnessing Projects

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Abstract

The exploitation of oceans is currently recognized as an abundant, geographically diverse and renewable source of energy which still remains largely untapped. Marine currents are, together with waves, one of the most promising sources of ocean energy thanks to their enormous potential for electricity production and their high predictability. Owing to the fact that the marine current harnessing industry has only just begun to demonstrate full-scale devices and device arrays, most of the research papers related to marine current harnessing technologies have been focused on improving their technical aspects. However, there is limited information as regards other aspects, such as those of an economic nature, that should be studied in detail in order not to compromise the future of these technologies. The objective of this research is to address this gap by providing an economic-financial methodology that will help quantify the profitability and feasibility of these renewable energy projects. The methodology developed considers the following aspects: (i) a definition of the fundamental variables of the economic model. (ii) a definition of its financing structure on the basis of the industry's common stockholder equity that partners must provide and the estimation of bank financing needs; (iii) a definition of the main components required to obtain the forecast balance, the forecast income statement and the forecast sources and application of funds for the entire service life of the project; (iv) a determination of the cost-benefit analysis, carried out using the information provided in the cash-flows of the project and the forecast sources and ap-

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