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Methodology to study the life cycle cost of floating offshore wind farms

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Abstract

The main objective of this paper is to determine a theoretical methodology process to study the life cycle cost of floating offshore wind farms. The principal purpose is adapting the LCC (Life-Cycle Cost Calculation) from several authors to the offshore wind energy world, providing a new method which will be called LCS_{FOWF} . In this sense, several general steps will be defined: life cycle definition, process breakdown structure, viability study and sensitivity study. Moreover, technical and economic issues and their relations will be considered. On the other hand, six life cycle phases needed to install a floating offshore wind farm will be defined: conception and definition, design and development, manufacturing, installation, exploitation and dismantling. They will be useful to define the majority of the steps in the process. This methodology could be considered to calculate the real cost of constructing floating offshore wind farms.

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1. Introduction

Due to fossil fuels have a limited life span [1] [2], the use of renewable energies, whose use is unlimited, will be of utter importance. Furthermore, the European goals for promoting the renewable energy sector have been established in 2009. In fact the 20% of final energy consumption should be from this type of energies in 2020 [3].

In this context, ocean energy could help to achieve this objective. In particular, floating offshore wind energy could be developed taking into account some traditional industries, as naval or industrial sectors.

However, this development will not be carried out without a preliminary study of the main costs which

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