

Offshore floating platform for renewable wind energy

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Summary

Floating and semi-submerged structures are the forefront of current studies in recent years. Research is aimed at investigating the technical and economical feasibility of such concepts in the deep offshore. The currently proposed solutions for offshore wind energy are mainly based on the petroleum offshore technology. In particular, for deep waters, classical tension leg platforms have been proposed, however weights and costs are not competitive for wind energy.

In this paper, an innovative supporting platform for wind turbines (patented in Italy), optimized for deep waters (but also suitable for shallow ones) will be presented. The supporting structure is made by a semi-submerged space frame and the buoyancy-anchoring system is obtained by appropriately combining light and relatively low-cost technologies already used in other fields. Two different solutions are proposed.

Keywords: power float, offshore, turbine, wind energy, deep water, semi-submerged structure, buoyancy-anchoring system, low-cost technology.

1. Introduction

The fast growth of renewable energies, and mainly of wind energy, puts on the table some environmental and landscape impact problems which make ever more difficult the onshore and near offshore plant installation.

Since wind energy is surely, among the renewables, the most competitive and mature and the energy potential is absolutely huge, it is important to develop structures able to allow the wind energy harvesting in the wide unused spaces of the deep marine environment where the distance from the shore has the potential to reduce the visual intrusion and social refusal.

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2. World and European scenery and the growth's forecast

2.1 The large underestimation of the predictions

Wind energy had in this first decade of the 21st century an incredible growth: in the past years all the growth predictions were wrong since they were very conservative.

As an example the first document of the European Wind Energy Association (EWEA) in 1991, despite being very optimistic in the panorama of that time energy predictions, expected the