Impact of Weather Conditions on the Windows of Opportunity for Operation of Offshore Wind Farms in Portugal

Nuno Silva[1a] and Ana Estanqueiro[1b]
[1]National Laboratory of Energy and Geology, Estrada do Paço do Lumiar, 22, 1649-038 Lisboa (Portugal)
[1a)]narsilva@gmail.com, [1b)]ana.estanqueiro@lneg.pt

ABSTRACT

The deployment of offshore wind parks face several challenges. Among them are the difficulties introduced by the atmospheric and sea conditions in accessing those wind parks. A *window of opportunity* is a timeframe when weather and sea conditions are acceptable and enable to perform specific tasks in the installation and operation/maintenance of the offshore wind park. This study identifies typical time periods of windows of opportunity to access three offshore Portuguese maritime regions. The accessibility conditions also take into account the system type transportation method for local access, namely, rubber boat, boat with OAS or helicopter. It was concluded that Portugal has adequate conditions for offshore site maintenance strategies, with a large number of windows of opportunity, but they are relatively short, therefore the installation of offshore wind parks must be carefully planned. This is an important factor in favor of the offshore wind farm deployments on the country.

1. INTRODUCTION

In recent years there has been a growing awareness and environmental education in society. In fact, the concerns regarding the environment, particularly climate change have been very present in people's lives. The most relevant evidence was the Kyoto Protocol (1997) or more recently the Copenhagen Summit (2009) on which were appointed and settled political/economical issues for the environmental benefit of the European Union. The evidence that endogenous production of energy (renewable) reduces the external dependence of imported fuels has significantly grown in society, particularly during the most recent years when the wind energy production has featured an expressive increase [1].

Currently, one of the most promising wind development areas in Portugal are the offshore wind parks [2]. However, there are several obstacles and challenges for the deployment of these wind farms. The "expertise" transition from land to the marine environment will need to deal with a harsher environment for operations, higher costs and also with the accessing impact for visiting the wind farm according to the weather and oceanic patterns.

The construction and maintenance operations should only be conducted in safe weather conditions: dependent on the wind speed, sea swell and visibility [3]. This dependence should not be neglected since a low profitability of the wind farm can occur when the strategy to manage the wind farm for repairing or installing materials is not appropriate.