INTELLIGENCE REPORT
ON OFFSHORE WIND FARMS GREECE

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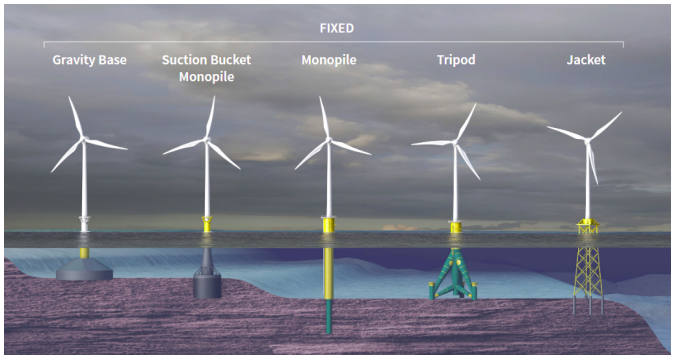
INTRODUCTION

It is noted that according to the Marine Renewable Energy Strategy recently announced by the European Commission, it is foreseen to increase offshore wind capacity in Europe from 12 GW today to 60 GW by 2030 and 300 GW by 2050.

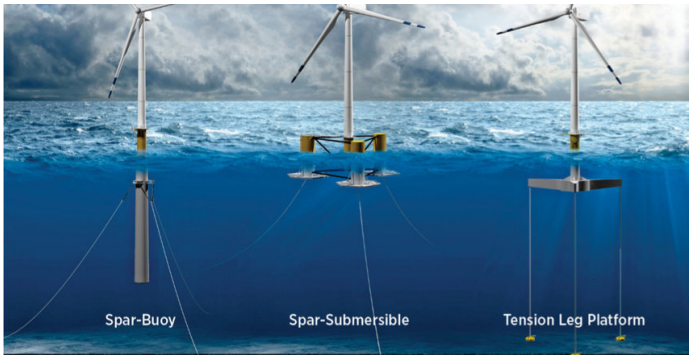
Offshore wind is expected to be the most important source of electricity generation consumed in Europe around 2040.

Offshore wind energy infrastructure can be distinguished into **Fixed**- based and **Floating** farms. Fixed-based wind turbines are installed on the seabed at shallow depths which, with few exceptions, are generally not found in the Greek seas. And the floating offshore wind turbine technology, seems to be particularly promising and attractive for Greece in recent years, is booming.

Fixed based



Floating farm



The vast majority of offshore wind farms built in the world up until about five years ago have been deep-seated, ground-mounted on the seabed. For example, in Belgium and the Netherlands the depth even twenty kilometres from the coast is 25 to 30 metres. So it is easy to put wind turbines founded on the bottom.

However, in the Mediterranean and in Greece we do not have many areas with such shallow depths. For example, in the Myrtoo Sea only a few tens of meters from the coast the depth is already hundreds of meters. Wind turbines cannot be founded there, so we choose floating wind farms.

There are also areas in Greece with shallow depths and there is interest in wind turbines embedded in the seabed, bottom fixed. They will be done in Greece as well. But the big massive development that will have a horizon not only in 2030 but also in 2040 and 2050 will be for floating, because these are the depths of the Mediterranean.

LEGAL LANDSCAPE

The proposed bill, according to what has been made known so far, provides for a mixed "hybrid" model for the development of offshore wind farms, where the state will select the broader zones that can be placed and will "mature" the licensing process to a certain point. Parts of these 'plots' would then be allocated to interested investors through competitive tendering procedures. The projects will be selected on the basis of the financial offers of interested parties for the price of compensation for the energy produced, as is currently the case with onshore wind and photovoltaics. According to a scenario of the Ministry of Environment, the siting of the marine "plots" and the conduct of the tenders will be undertaken by EDEY, while ADMIE will also play a key role in connecting the marine parks to the transmission grid.

Greece is exploiting its wind potential by establishing onshore wind farms in island regions, including Crete, Euboea (or Evia) and the Aegean Islands. Currently, the country has onshore wind farms of 4GW capacity, covering 12% of the electricity demand (Ministry of the Environment and Energy, 2019).

According to Greece's National Energy and Climate Plan (Ministry of the Environment and Energy, 2019), Greece will have to install 7GW of wind energy capacity by 2030 to meet its environmental targets. The potential for wind energy in Greece is huge, especially for offshore wind energy, which could even help islands achieve self-sufficiency.

There is limited literature on the costs and benefits of offshore wind farms in Greece. A study by Zountouridou et al. (2015) explores the feasibility of offshore wind farms in the deep waters of the Mediterranean Sea. In particular, she discusses an investment in a floating offshore wind farm of 12MW capacity installed at 540m water depth and 15km from the shore of Santorini (an island in the eastern Mediterranean Sea). The farm is assumed to replace energy produced by oil-based plants. The benefits of this investment are explored, including savings from reduced CO2 emissions and oil imports. The study also sheds light into gains in welfare flowing from a cleaner environment. It is emphasised that the offshore wind technologies in the Mediterranean differ from those in the Northern countries, as the Mediterranean Sea has deeper waters.

A more recent study by Spyridonidou et al. (2020) identifies potential locations for offshore wind farms in Greece and estimates the investment costs for the different areas. According to the authors, the selection of sites for installing offshore farms will depend on: (i) legislation around National Territorial Waters, (ii) wind velocity, (iii) water depth, (iv) military zones, (v) seismic hazard zones, (vi) underwater cables, (vii) distance from ports, and (viii) distance from high voltage electricity grid. The authors identify 16 possible offshore wind projects in different locations in Greece and calculate their investment costs and strategic value. The implementation of 12 offshore wind projects is able to generate socio-economic benefits using only 60% of the total investment capital.

(Source: ELIAMEP, Offhsore Wind Energy in Greece, Estimating the socio-economic impact,#81/2021)

PROPOSED LEGISLATION - 22.07.2022

On 22.07.2022, the Greek government published the proposed legislative and regulatory framework for offshore wind power in Greece. The publication of the legislation follows a public consultation conducted jointly by the Hellenic Wind Association (ELETAEN) and the Norwegian Wind Energy Association NORWEA to explore legal and strategic planning issues associated with the development of offshore wind farms in Greece.

The draft Law of the Ministry of Environment and Energy entitled "*Provisions for the simplification of environmental licensing, environmental inspections and environmental protection, urgent forestry, land use and urban planning provisions, the establishment of a framework for the development of offshore wind farms, addressing the energy crisis and issues of circular economy*" entails the possibility of establishing offshore wind farms, modifications to land use and exemptions from environmental licensing.

The main provisions for offshore wind farms provide for the following:

The bill defines the Hellenic Hydrocarbon Management Company, which is currently responsible for the concession of areas for hydrocarbon exploration, as the competent body for the preparation of technical studies for the identification and delimitation of the Areas of Organised Development of offshore wind farms (AODs). The technical study shall propose areas for the installation of wind farms within these areas, in accordance with criteria that ensure the technical and economic self-sufficiency, as well as the viability of the wind farm projects installed within them. The parks will be developed through competitive tendering procedures, with the award criterion being the lowest price per megawatt-hour produced.

The bill sets minimum participation requirements for interested parties, which should have at least **10 years of experience** in the development and operation of offshore wind farms with a capacity of at least **100 megawatts (MW)** and should have an **annual turnover** (cumulative if a consortium) of at least **€2 billion**. In addition to technical and economic suitability, the granting of the licence is also subject to the condition that there are no national security issues.

The bill also stipulates that **ADMIE** is solely responsible for the design, development, construction and operation of projects to interconnect offshore wind farms with the national transmission system. The cost of construction of the interconnection projects will be recovered by the ADMIE through the System Usage Charges.