

BLUE ECONOMY ENTREPRENEURSHIP IN OFFSHORE ENERGY IN CYPRUS & GREECE

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Abstract

Cyprus and Greece are of immense geo-economic, strategic and environmental importance within the Mediterranean region. At the same time, negotiations over the delimitation of maritime boundaries between adjacent states usually involve controversies, cooperative actions, or dispute settlements. Behaviors of stakeholders, who might otherwise be prone to contribute to improvements and achieve a win-win situation, sometimes end up at zero-sum games or in worse conditions for all parties. Game theory can recognize and construe the behaviors of parties to exclusive economic zone and continental shelf problems and describe the results of interactions of different parties who are pursuing their own objectives in the evolution of a negotiation's setting. Its strategic relevance can be easily perceived if noted that Greece and Cyprus jointly share a common border with another ten countries, out of which with eight common sea borders also exist. Furthermore, if the aforementioned are combined with the current European energy network projects & prospects in the region, we have just described the pillars of probably the most dynamic entrepreneurial and diplomacy framework that will shape the future in this region for the first half of the century. The aim of this working paper is to analyze from an entrepreneurial perspective the opportunities and challenges for offshore energy, which consists an emerging Blue Economy sector with comparative advantages and enormous growth potential for the Greek and Cypriot island economy.

Keywords: blue economy, entrepreneurship, offshore energy, Exclusive Economic Zone, game theory negotiations, Greece, Cyprus, Mediterranean Sea

1. INTRODUCTION

Negotiations over the delimitation of maritime boundaries between adjacent states usually involve controversies, cooperative actions, or dispute settlements. Behaviors of stakeholders, who might otherwise be prone to contribute to improvements and achieve a win-win situation, sometimes end up at zero-sum games or in worse conditions for all parties.

When the combination of the Mediterranean context and framework of the Exclusive Economic Zones (EEZ) are considered, we realize that transform the substantive correlations of countries and spaces. Due to geographic distances, the influence of the EEZ is important on the sizes of states. Thus countries which are considered traditional large, even if coastal, may have a relatively small EEZ. The opposite is applicable in the case of Greece, which is emerging as having the second largest EEZ after that of Italy in the Mediterranean. And when the size of the Greek EEZ is considered, the total size of the country is comparable to that of Germany and Romania jointly. Likewise, in the case of the small Cypriot island economy, the size of its EEZ is nine times larger in comparison to its *terra firma*.

The strategic relevance of the Greek and Cypriot EEZs can be further perceived if noted that Greece and Cyprus stand at the crossroad of three continents and jointly share a common border with another ten countries, out of which with eight of them common sea borders also exist.

This modification of the Mediterranean geography is certainly directly related to the application to issues of fisheries, circular economy [1], [2] renewable energy policies [3], [4] and offshore energy challenges. However, if we further consider the outlook shaped in the offshore production of hydrocarbons in Greece, Cyprus and Israel, briefly portrayed by the ex-Greek PM as having the potential to cover half of the needs in natural gas in Europe in the coming 30 years, we realize that it is no hyperbole to consider the Mediterranean as the Middle-East of the 21st century.

Finally, if the aforementioned are combined with the current European energy network projects under completion, such as the EuroAsia Interconnector, which aims to link Greek, Cypriot and Israeli power grids via the world's longest submarine power cable, we have just described three of the pillars of probably the most dynamic entrepreneurial and diplomacy framework that will shape the future in this region for the first half of the century.

By analyzing the catalytic roles of the aforementioned forces in the formulation of the near future European entrepreneurial affairs, the paper finally asserts that the issues of delimitation of the Cypriot and Greek EEZs have the potential to allow moving from a Nash toward Pareto equilibrium, both for Cyprus, Greece and the European Union.

2. THE ENERGY INFRASTRUCTURE PACKAGE

In October 2011, the European Commission (EC) listed a complete package to boost trans-European infrastructure development in the areas of transport, energy and information society [5], [6]. Respectively, the Energy Infrastructure Package is comprised of legislative guidelines, proposals for setting up infrastructure policies and the Connecting Europe Facility (CEF) regulation, in charge of providing financial aid.

In this context, the term energy infrastructure covers electricity transmission lines, gas, CO₂ and oil pipelines, Compressed Natural Gas, Liquefied Natural Gas reception facilities and electricity and gas storage.

The trans-European energy infrastructure guidelines identify eight priority corridors & four thematic areas that must be implemented in the coming decade. Further, to materialize these corridors/areas into tangible projects, the guidelines consider a new approach of identifying energy infrastructure projects that can obtain the label of Projects of Common Interest (PCIs). Thus, to qualify for financial support under the CEF, projects must firstly be recognized as PCIs.

Based on the recommendations made by the European Networks of Transmission System Operators (ENTSO), draft regional lists of potential PCIs were established in the end of 2012, and incorporated within the Ten-Year Network Development Plans (TYNDP). The final Union-wide list was approved in October 2013 and includes 248 PCIs, based on several criteria such as cost-benefit analysis (CBA), demonstration of added value towards the achievement of EU's overall energy goals and cross-border benefits which can further act as a mechanism facilitating cost allocation among EU members.

From 2014 onwards, PCIs will be eligible to submit a request for financial support for studies under the annual call for proposals in the CEF. Furthermore, they may also be eligible to submit a request for financial support for works under the CEF, provided they meet the following two conditions:

- the project should demonstrate through a CBA and business plan that it provides societal non-commercial benefits;
- the affected national regulatory authorities have provided a positive opinion on the CBA and on the scope of the non-commercial benefits.

2.1. The eight priority corridors

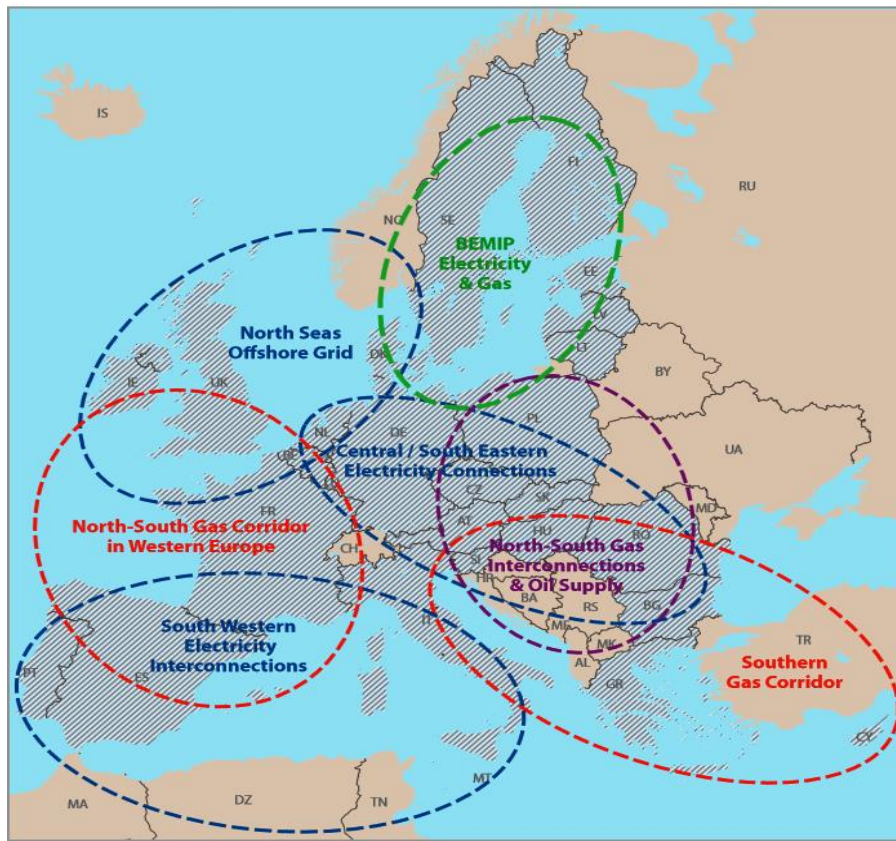


Fig. 1. European energy infrastructure priorities for electricity, gas & oil.

Source: Adopted from © European Union – Directorate-General for Energy [7]

In Figure 1, the eight priority corridors included in the Energy infrastructure package are depicted. These included the following:

- *Northern Seas offshore grid*, to facilitate transport of electricity from renewable offshore wind energy sources;
- *North-South electricity interconnections in Western Europe with the Mediterranean*, also to combine electricity from renewable sources;
- *North-South electricity interconnections in CEE/SEE* to develop the internal market and integrate generation from renewable sources;
- *Baltic Energy Market Interconnection Plan in electricity/gas*, to reinforce an integrated regional gas energy market in the Baltic Sea Region;
- *North-South gas interconnections in Western Europe*, to diversify routes and to increase short-term deliverability;
- *North-South gas interconnections between the Baltic Sea region, the Adriatic and the Aegean Seas and the Black Sea & Oil supply connections in CEE*, to raise security of supply and condense environmental risks.
- *Southern Gas Corridor* for the transmission of gas from the Caspian Basin, Central Asia, the Middle East and Eastern Mediterranean Basin to the Union, to enhance diversification of gas suppliers.

2.2. The Southern Gas Corridor

The major strategic perspective of the Southern Gas Corridor (Figure 2) is two-fold:

- to bring new gas sources to the EU, and
- diversify particularly concentrated markets in SEE.

The purpose is to directly link the EU gas market to large deposits of gas in the Caspian Region & Middle East and the Eastern Mediterranean basin. Furthermore, the gas fields are geographically even closer than the main Russian deposits.

The strategic objective of the corridor is to achieve a supply route to the EU of roughly 10-20% of EU gas demand by 2020, equivalent roughly to 45-90 bn cubic meters of gas per year (bcm). Ultimately it is expected to create an additional supply corridor, in addition to the existing ones from North Africa, Russia and Norway. Overall, diversification of sources generally improves competition and thus contributes to market development whilst at the same time enhancing security of supply.

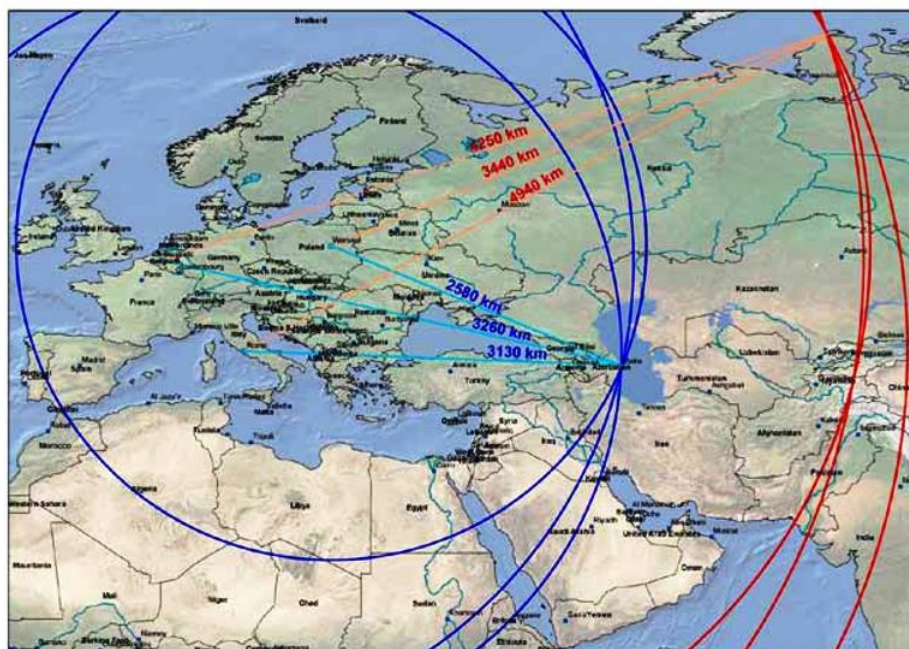


Fig. 2. Comparison of distances of main Eastern gas supplies to main EU consumption hubs.

Source: Adopted from © European Union – Directorate-General for Energy [8]

2.3. Projects of common interest in the Eastern Mediterranean

In Figure 3, specific projects in the SEE region are depicted. Furthermore, in parallel to the Southern Gas Corridor, there is particular interest in the development of a gas corridor for the transmission of gas produced offshore in the Eastern Mediterranean (mainly Cyprus and Israel). In addition, the EuroAsia Interconnector is already under construction linking Greek, Cypriot, and Israeli power grids via the world's longest submarine power cable with a length of 287 km and a power rating of 2,000 MW. This interconnector is expected to be completed at the end of 2022.

The EuroAsia Interconnector is part of the so called EastMed corridor, which also includes the East Med Pipeline, whereas the Cypriot government currently considers initiating additional infrastructures, including the pipelines and liquefaction plant in Vasilikon.

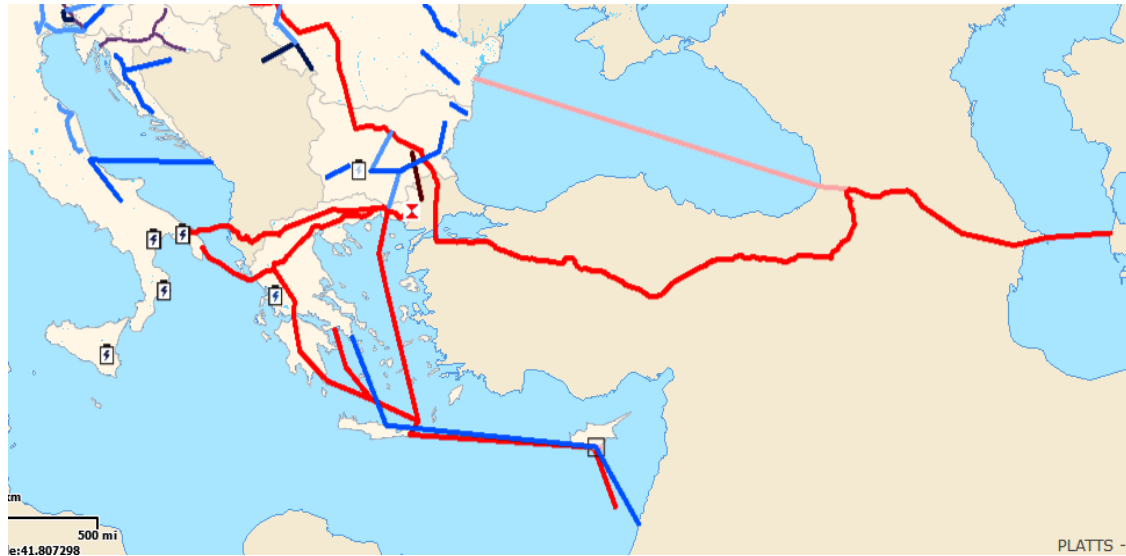


Fig. 3. European energy infrastructure priorities for electricity, gas & oil.

Source: Adopted from © European Union – Directorate-General for Energy [9]

3. THE GREEK AND CYPRIOT PLANS FOR OFFSHORE DRILLINGS

Greece has initiated its tender process for offshore oil and gas (hydrocarbons) exploration as of August 26, 2014 in 20 block areas in the Ionian Sea and Crete. The evaluation for Blocks 2 and 10 was finalized and the preferred bidders for Block 2 Total Greece as the operator, Edison International and the Hellenic Petroleum and for Block 10 the Hellenic Petroleum.

In early December 2017 the Official Journal of the European Union opened the international tender for the exploration of three offshore blocks in the Ionian Sea and west and southwest of Crete, which was open for application until the end of February 2018. A consortium comprised of Total (40%, operator), ExxonMobil (40%) and ELPE (20%) submitted offers to tenders offering hydrocarbon exploration and exploitation rights for two offshore blocks, west of Crete and southwest of Crete, while a further offer for an Ionian block, offshore western Greece, was submitted by Repsol (50%, operator) and Hellenic Petroleum [10].

The legal and financial framework that will govern the exploratory drilling, such as the new law on concessions:

- incorporates the latest trends and best practices internationally,
- a stable and predictable environment for investors.

Greece is utilizing a licensed-based system where applicants will have to acquire certain licenses in order to qualify as operators. Successful bidders will be awarded exploration and development rights for a primary term of eight years which will be subject to extensions. The Greek government has made several concessions with the objective of making the process more attractive to investors and international oil and gas companies. Paramount among these is a substantial decrease in its corporate tax rate from 40% to 25%. The 25% consists of a 20% income tax and a 5% regional tax.

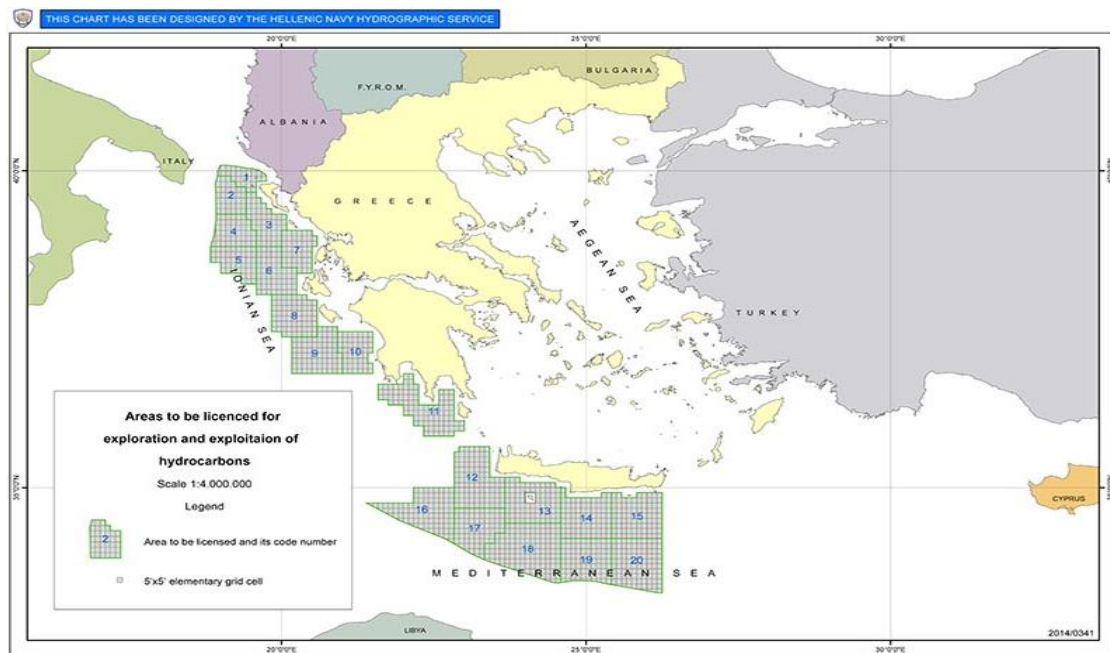


Fig. 4. Areas to be licensed for exploration/exploitation of hydrocarbons.

Sources: Adopted from © European Union – Directorate-General for Energy [8]; Ministry of Environment and Energy, Greece (2018): ypeka.gr

To be noted that in a parallel direction, in 2011, significant offshore reserves of approximately 7 trillion cubic feet of natural gas were found in Cyprus' Exclusive Economic Zone (EEZ). Three licensing rounds have been performed since then. The Cypriot government expects to complete the required infrastructure, including the pipelines and liquefaction plant by 2018 and begin exporting natural gas in 2020.

Accordingly, as per the Cypriot Energy Minister Giorgos Lakkotrypīs [11], "Cyprus, as the southernmost EU member state in a volatile and troubled region, has the potential to become a regional liquefaction hub and contribute to the long-term geopolitical stability, promoting peace and economic development."

Investors here have included the Korean Gas Corporation (KOGAS), a South Korean public natural gas company that was established by the Korean government in 1983 (Figure 5). Also ENI, an Italian multinational oil and gas company headquartered in Rome. It has operations in 79 countries. Further, recently joint ventures have been formulated, such as those between Exxon Mobil and Qatar Petroleum to explore hydrocarbon in Block 10, and between ENI and the French Total in blocks 6 and 11. Also, the American Noble Energy operates Aphrodite (block 12), in partnership with Shell and Israel's Delek Drilling.

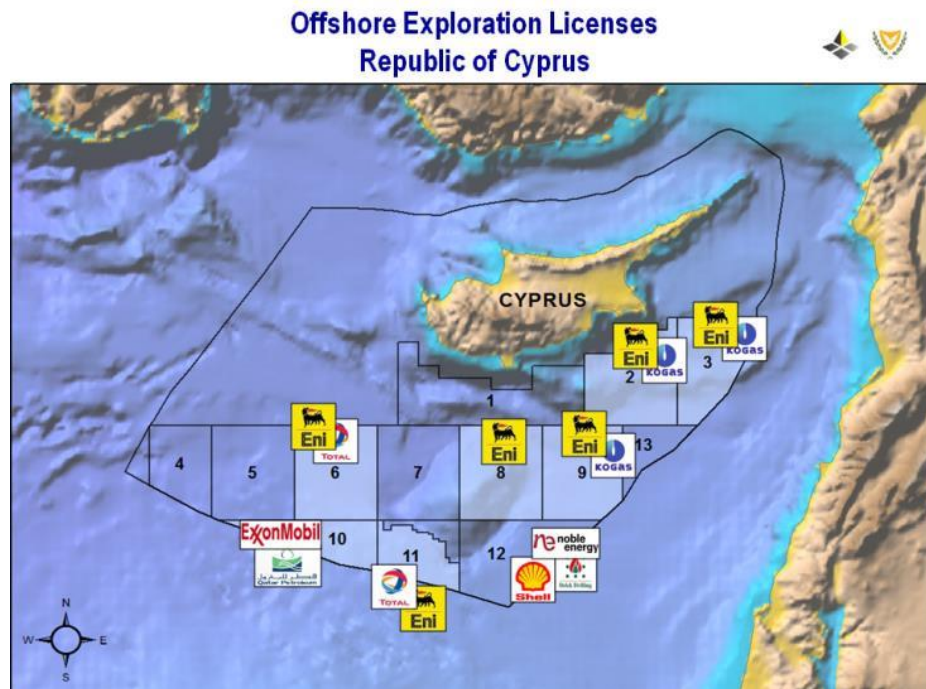


Fig. 5. Offshore exploration licenses and global energy groups/consortiums.

Source: Ministry of Energy, commerce, Industry and Tourism, Republic of Cyprus (2018)

4. THE STRATEGIC PRIORITY OF ESTABLISHING THE GREEK EEZ

An exclusive economic zone (EEZ) is a sea zone over which a state has special rights regarding the exploration and use of marine resources, including energy production from water and wind. It stretches from the baseline out to 200 nautical miles from its coast. The difference between the territorial sea and the EEZ is that the first confers full sovereignty over the waters, whereas the second is merely a "sovereign right" which refers to the surface of the sea (Figure 6). The contiguous zone is a band of water extending from the outer edge of the territorial sea to up to 24 nautical miles (44.4 km; 27.6 mi) from the baseline, within which a state can exert limited control for the purpose of preventing or punishing "infringement of its customs, fiscal, immigration or sanitary laws and regulations within its territory or territorial sea". A depiction of the Greek and Cypriot EEZs is depicted further in figure 7. The forthcoming elimination of the EEZs in both counties, as aforementioned in the introduction, is of crucial importance for the exploitation of future offshore oil & gas reserves, as well as for the establishment of exclusive fishing rights, among others, in this vast area.

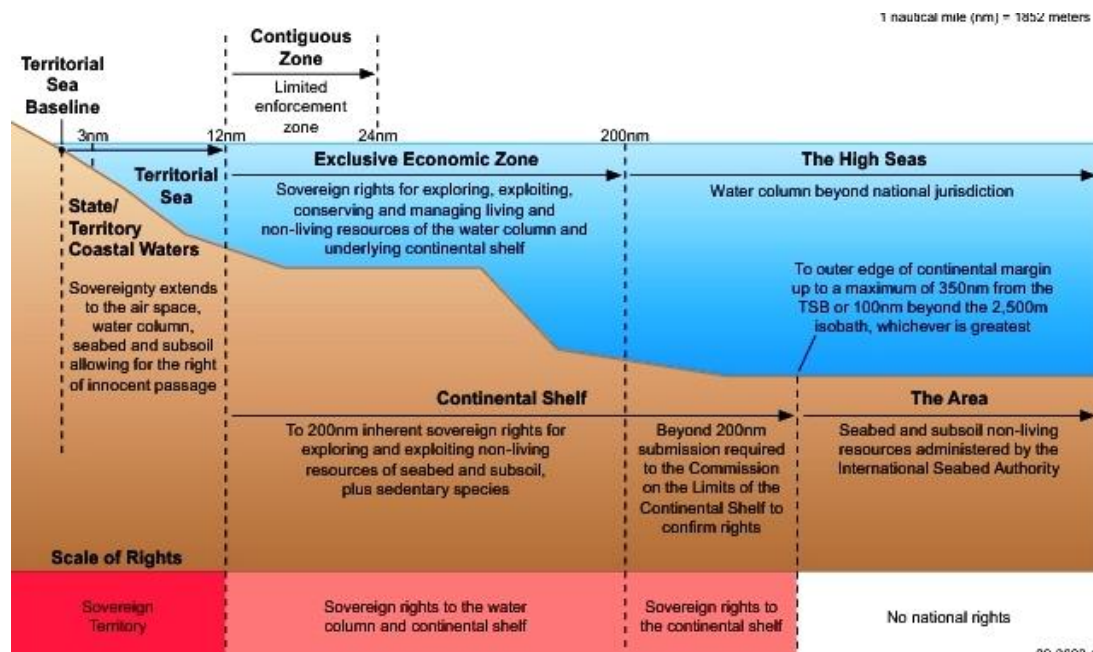


Fig. 6. Illustration of maritime zones defined by the UN Convention on the Law of the Sea.

Source: National Oceanic and Atmospheric Administration, US Dep. of Commerce (2018), noaa.gov



Fig. 7. Map of the Greek and Cypriot Exclusive Economic Zones (EEZs)

Source: Marineregions.org (2018)

5. CONCLUSIONS

Oil and Gas exploration and production extends to a long life cycle (i.e. due diligence, prequalification, exploration seismic, site survey, exploration drilling, appraisal drilling, developing, production and decommissioning). It is a strategic game not solely for the traditional large International Oil Companies (IOC), or Super Majors, but increasingly for other specialized IOCs and

National oil & gas companies (state-NOC). Further, EEZ bears an enormous dynamic that is visible to the specialists, but still unknown to others. The sphericity of the areas touching the EEZ is spectacular and without it is difficult to perceive the newly and rapidly arising blue economy, entrepreneurial [8] and business prospects (i.e. investments also in fishing, wind, wave, solar energy systems and infrastructures).

By pinpointing to the three catalytic roles of the aforementioned forces of (a) geography, (b) potential offshore production of hydrocarbons in Greece, Cyprus and Israel (as well as in Egypt, as revealed by the recent discovery of the Zohr gas field, an offshore supergiant natural gas field located in the Egyptian sector of the Mediterranean Sea), and (c) impact of projected energy infrastructure investments and collaborations in European foreign affairs, the paper asserts that the issue of delimitation of the Greek EEZ has the potential to allow moving from a Nash toward a Pareto equilibrium, both for Greece, Cyprus and the European Union. This is a critical factor to further driving forward the Blue Economy entrepreneurship, along with its various related aforementioned activities in both economies, as well as starting to materialize in the near future its immense prospects, closing any skill gaps [12], managing their financial and environmental challenges [13], [14], [15], [16] and making the offshore energy sector attractive for employment [17, 18, 19], and thus opening the road to their sustainable recovery.

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