

Cyprus and Greece Natural Gas Perspectives, Production Costs and the European Security of Supply

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Abstract. The Eastern Mediterranean area is on its way to become an important energy province and without question it remains home to large hydrocarbon resources, even though the countries in the region, excluding Egypt, have been quite slow to locate and discover them. From a geopolitical point of view offshore Cyprus, Israel, Lebanon, Turkey and even Syria has in the past decade become part of a broader dynamic in the Eastern Mediterranean sea. This dynamic includes offshore oil and gas exploration, discoveries of giant natural gas fields and development of the necessary infrastructure for producing these fields. Supergiant gas finds are some of the fields that are now producing or are under development in the region.

After making a series of significant gas field discoveries like "Dalit", "Tamar", "Leviathan", "Aphrodite" and supergiant "Zohr", Cyprus, Egypt and Israel are now trying to figure out how to utilize them. One straight forward policy is to meet domestic energy demand, displace oil in the domestic energy mix, generate more electricity from gas and hence reduce reliance on imported oil and coal. Moreover, in some years or so, these countries will have the possibility of exporting surplus gas to markets where they can fetch better prices. By becoming exporters they will also be able to contribute to European gas supply security in terms of diversifying both routes and sources. However, the question of whether the discovered reserves can find their way to the domestic and international markets in a timely manner requires careful examination. Meeting domestic demand and creating surplus for exports necessitates the development of the discovered fields, i.e., converting reserves into production capacity. Companies will carry out costly exploration and field development endeavors only if they foresee the ability to commercialize their discoveries with a favorable rate of return. In this sense, much will depend on the security of the region, the stability of the countries and the political atmosphere, on the natural gas accumulations total production cost, on the gas price the governments will be asking for on the domestic market and on the countries regulatory, fiscal and gas policies.

Based on the above considerations our work has particularly focused on the forthcoming gas fields' discovery perspectives in Cyprus and Greece, on the contractual terms needed from oil and gas companies, on the level of gas production costs and the importance of synergies on attracting regionally oil companies' investments through licensing rounds.

Keywords: Hydrocarbon, East Mediterranean, security, Economic Exclusive Zone.

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INTRODUCTION

A wide ranging debate related to Cyprus and Greece's possible offshore natural gas resources has been conducted over the last four to five years among petroleum geologists, engineers and energy economists. As it was expected the ongoing debate has raised important regional

economic expectations among politicians and the public. From a geological point of view recent natural gas discoveries realized offshore, Cyprus, Egypt and Israel have shown us that a great part of the East Mediterranean offshore area, located in a region between north, west and south of the island of Crete, south of Cyprus, Israel, Egypt and offshore Lebanon, was for several tenths of million years part of the “Tethys Sea”. “Tethys Sea” originally was the place where the giant oil and gas fields of Saudi Arabia, Iran, Iraq, Syria and the East Mediterranean ones were created (Fig.1). Recent East Mediterranean studies based on gas field discoveries like “Dalit”, “Tamar”, “Leviathan” and “Zohr” analysis showed us that important geological analogies are present regionally, which in the future could lead to further natural gas development opportunities located into the Cyprus Exclusive Economic Zone (EEZ) and into the south Crete Greek Continental Shelf.

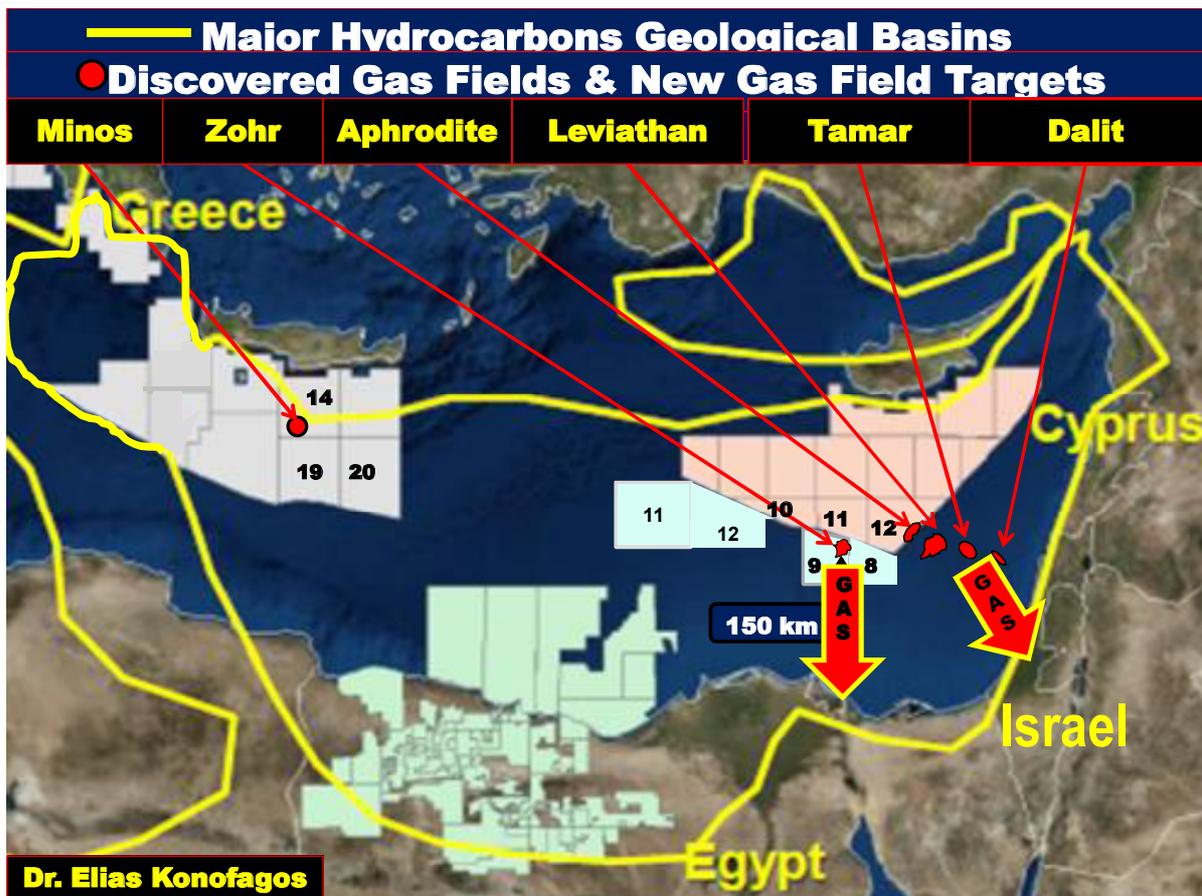


FIGURE 1. Major Hydrocarbons Geological Basins in Eastern Mediterranean.

Creation of new development opportunities offshore Cyprus, Egypt and Greece will need to attract oil companies for exploration and production offshore contractual investments. Taking into account the current geopolitical situation in the region (Syrian civil war, refugee crisis, presence of the Islamic State, Turkish military Coup, etc) and the recent collapse of the International gas prices, the oil companies will invest only if important technical, economic, legal and security contractual incentives can be implemented and offered to them by the host countries.

Our work will focus briefly on the current regional geopolitical situation in the East Mediterranean and will analyze the case by case relevant production costs faced regionally by the

oil companies and the necessary contractual terms needed in order to satisfy both the oil companies and the host countries in question.

THE ACTUAL GEOPOLITICAL SITUATION IN THE EAST MEDITERRANEAN

Since 2010 new geopolitical developments have caused a shift in old traditional regional interests, behavior patterns, and alliances between the Eastern Mediterranean's primary actors, Cyprus, Egypt, Greece, Israel, Syria and Turkey and have determined their actions. The change began with the sudden collapse in Israeli - Turkish relations [after the 2010 Mavi Marmara incident](#) and the collapse of Egyptian - Turkish relations, following the 2013 military revolution against the Islamic regime imposed by the Muslim Brotherhood after President Mubarak's resignation in February 2011. These events were added to the deteriorated situation in Syria and the historically troubled relationships between Cyprus, Greece and Turkey over the Turkish occupation of the northern part of the Cyprus Republic and the unfounded Turkish claims on the Aegean Sea and the Greek islands. The already tense relations became more complicated with the discovery of hydrocarbons deposits in the region in 2009-10.

After the dramatic political events that took place mainly in Syria and Turkey in 2015 and 2016 that have turned Eastern Mediterranean into one of the key areas for global security, the situation in the region is evolving around the following key aspects:

- The refugee crisis due to chaotic conditions in Syria.
- The growing influence of ISIS and the struggle against the totalitarian Islamism in its various forms.
- The consequences and President Recep Tayyip Erdogan's reaction to the failed military coup in Turkey.
- The developments and the prospect for cooperation in the field of energy.

The Refugee Crisis

The sudden and massive flow of population due to the chaotic conditions in Syria during the last years had a substantial impact on the security, the economy and on the domestic politics of the countries in the area, but mainly affected Greece and Turkey. It has generated new tensions, and intensified pre-existing ones, not only between the two countries, but also between Turkey and EU, and influenced the Union as a whole. This impact will be magnified as the crisis continues and its scale increases. On September 2015, the UN announced that in Syria, from a pre-war population of 22 million people, 7 million had been displaced, with more than 4 million seeking safety outside the country. Of those 2.1 million Syrians were registered by UNHCR in Egypt, Iraq, Jordan and Lebanon, and 1.9 million Syrians were registered by the Turkish government¹.

The immediate challenge is to manage the refugee flows arriving from Turkey to Greece crossing the Aegean Sea. Only in 2015 more than 850.000 refugees transited Greece on their way to central Europe. The refugee flow peaked up at a time when both Greece and Turkey were already facing a set of serious challenges; economic problems and the persistent low economic growth of Greece along the territorial disputes between the two countries due to Turkey's claims in Aegean and in Cyprus. The growing uncertainties concerning Turkey's relationship with the EU, the recent military coup against President Erdogan and his reactions to it, the Kurdish problem

¹ "The Eastern Mediterranean in 2020: Possible Scenarios and Policy Recommendations" ELIAMEP Policy Paper, April 2016.

within the country and at its southern borders with Syria and on the east with Iraq and the constant and pervasive threat from ISIS.

The refugee crisis represents to both countries primary a humanitarian concern, due to the reception, management and hosting problems, which such a huge number of people create. It is also an important security question, due to the difficulties involved in tracking so many people and the actual danger of terrorist members being able to infiltrate the refugee flows. The influx of immigrants has also revealed old, seemingly forgotten, radical social tensions: Xenophobia feelings, the sense of sovereignty loss and the consequent need to impose tight border control, anti Islamic feelings and rise of extreme right wing political parties. All these phenomena add significant tension to the already strained relationships among the countries of the area and undermine every reasonable and staid voice, already weakened by the economic crisis. The problem is not an easy one to solve and exceeds the Eastern Mediterranean limits¹. Cooperation and economic growth that derive from the exploitation of the energy resources could have a significant impact towards a more effective management of it.

The situation in Syria remains a most pressing regional challenge. It influences all regional actors, touching simultaneously humanitarian, refugee, sovereignty, security, balance of power and regional disputes issues. It would be extremely difficult to reach a diplomatic solution without the engagement of all the neighboring countries, but also the EU, Russia and the U.S.A. Cyprus and Greece, both members of the EU, countries with longstanding close and good relations with Syria and traditionally valued and respected by the Syrian people have the rightful obligation to actively become involved and work for a solution. "Time is a critical factor as an agreement must be reached before the conflict in Syria, and especially ISIS, further "contaminate" neighboring countries and continues to send waves of refugees to Europe."²

Totalitarian Islamism - ISIS

Parallel to the eruptive situation in Syria, totalitarian Islamism and the persisting influence of the so-called Islamic State are two additional significant factors that influence the traditional behavior of all actors, not only regional, in the Eastern Mediterranean area. The ISIS organization has initially surprised the world community with its aggressiveness and effectiveness. It gained the control of key cities in Syria and Iraq such as Raqqa, Ramadi and Mosul and in many occasions acted as a sovereign state with its own distinctive administrative institutions, from education to health and from justice to legislation, drawing on significant financial resources and a growing infrastructure. After their initial embarrassment and period of inaction the western powers managed to gradually restrict ISIS sources of income and financial resources and succeeded in delivering significant strikes to its military flank³. Currently ISIS is on the retreat; Mosul will soon be liberated and the organization will probably be militarily defeated and politically marginalized⁴.

¹ "The number of immigrants is increasing as a result of various conflicts and, in the near future, climate change. However much one tries to de-securitize the migration question, relations between Europe and the Middle East and the West and Islam will also affect domestic stability in those European countries with a substantial Muslim community." "The Eastern Mediterranean in 2020: Possible Scenarios and Policy Recommendations" ELIAMEP Policy Paper, April 2016.

² Dr. Dokos Thanos Director ELIAMEP. "The Eastern Mediterranean in 2020: Possible Scenarios and Policy Recommendations" ELIAMEP Policy Paper, April 2016.

³ On October 25th a Russian Naval Task Group composed by the CV Admiral Kuznetsov, Cruiser Kirov, two Destroyers t. Udalov, two General Support Ships and two Ocean Tug boats crossed the strait of Gibraltar on its way to the coasts of Syria. The French aircraft carrier PA Charles De Gaulle task force, escorted by the FGs Cassard, Jean de Vienne, Chevalier Paul, the Sub Rubis and the GSS Marne, is already operating in the area. A combined attack plan against ISIS remains to be confirmed.

⁴ It is critical to plan and administer the after ISIS sovereignty issues. Turkey, Iraq and the, from many actors desired, under creation Kurdish state are claiming the right of possession.

However the popular support that offers ISIS legitimacy and the reasons of its creation will remain and the main problem caused by totalitarian Islamism will be contained rather than resolved. Eventually radical Islamic and terrorist groups will seek other ways of action and consequently tensions will intensify and the stability prospects will weaken. It is almost certain that the winner of this war will not be the party that has the newest and most expensive or sophisticated weaponry, but the party that manages to inspire and motivate the people. The easiest way is to welcome fleeing refugees, win the hearts of the people and engage them to a political solution inside their own countries.

Developments in Turkey

The July 15, 2016 military coup attempt in Turkey has driven Ankara into political chaos and raised some significant questions regarding its:

- Strategic orientation within the western geopolitical system. President Erdogan suspects certain western capitals of keeping distances from, if not secretly supporting, the coup attempt and feels threatened by the alliances signed by Cyprus, Egypt, Greece and Israel on economic, energy and security domains. He will probably try to counterbalance these fears by bridging his differences with Israel and Russia.
- Democratic and Islamic identity. The Turkish authorities are still detaining thousands of judges and suspending tens of thousands of education officials on suspicion that they may sympathize with the exiled Erdogan's opponent Fethullah Gulen, whom Turkey accuses of inspiring the coup attempt. The July 20 declaration of a three-month state of emergency, which was extended for another three month period on October 3rd, will allow the government to rule by decree and will test the democratic sensitivities of Turkey's allies. Furthermore President Erdogan's recent efforts to undermine the secular and cosmic western values introduced by Kemal Atatourk during the 20's and 30's, his openly declared strategic vision to transform Turkey's constitution and strengthen the Presidential powers and to revise the Lausanne Treaty complete a picture of uncertainty on his intentions to lead the country towards a deeper Islamic state much less moderate than today's and to challenge the geographical borders and zones of influence which were imposed almost 100 years ago.
- Ability to defend itself. In addition to his ambition to minimize the influence of the Kemalic tradition inside the Turkish society mentioned above, Erdogan's administration sensitive relationship with the Turkish military is under enormous tension as nearly one-fourth of all senior officers (one-third of the Air Force officers) have either been detained or arrested. This undermines the readiness of the Turkish armed forces in a period when the problems with ISIS and the Kurds are escalating and the situation in Syria is unstable.

Cooperation Prospects in the Energy Field

The recent developments on the energy field in the East Mediterranean, which complete the region's complex political situation, have significant impact and led to a growing geostrategic shift affecting all bordering countries, especially Cyprus, Egypt, Greece, Israel and Turkey. The question that remains to be answered is whether the prospects of exploitation of this geological wealth can become the driving force behind a future cooperation among all the countries of the area.

The signing of the agreement on energy cooperation among Cyprus, Greece and Israel in Nicosia in February 2016 and among Cyprus, Egypt and Greece initiated in 2013 and confirmed in Cairo on October 2016, have very important implications for the future of this region. These trilateral alliances are forming new regional alignments and balances, offer to all the members a sense of security, provide to Israel the much needed strategic depth and after the lifting of

sanctions against Iran can create new economic opportunities by exploring the potential in the domain of energy.

Publicly, all four allies declare that these agreements are not against any other country, meaning specifically Turkey. However the reality probably differs. The four countries were obliged to form trilateral alliances in order to confront Turkey's revisionist attitude and aggressive rhetoric. Of these countries, Israel, a strong USA ally, is considered a major military power. Egypt with its strong Army, under the new secular regime is facing some internal security problems has strengthened its position after the recent discovery of the huge "Zohr" deposit. Greece with its Naval, both commercial and military power, and the Republic of Cyprus, both members of the EU, complete the sides of the two triangles. At the same time both countries are facing economic problems and the Cyprus sovereignty problem remains unsolved¹.

Main Regional Actors Examination

Republic of Cyprus: The Republic of Cyprus is the only country that has been able to sign bilateral agreements that delimit and demarcate its EEZ respectively with Egypt February 17, 2003, Lebanon January 17, 2007, yet to be ratified and with Israel December 17, 2010.

The multilevel agreements Cyprus has signed with Egypt, Greece and Israel, address various issues like trade and tourism, with [energy cooperation](#) being the [central element](#) in all these partnerships. Besides these reasons, from Nicosia's perspective, security concerns impose another necessity for participating in regional alliances. More specifically, Turkey's threats against Cyprus' energy-related activities are added to the occupation of the northern part of the Island by Turkish military forces and amplify the pre-existing perceptions of Turkey as an aggressor. In this context, in addition to collective benefits in multiple sectors, the Cyprus - Egypt - Greece and Cyprus - Greece - Israel partnerships render Cyprus a part of a broader regional alliance that provides diplomatic, political and security support to the country. For Cyprus, the formation of these partnerships is unquestionably a positive development.

On the energy domain, at present, Cyprus does not possess enough reserves to build its own LNG exploitation infrastructure and facilities or a major pipeline to Greece or anywhere else outside the immediate vicinity of the island. The cost to develop a liquefaction plant is extremely high and only if more gas reserves are discovered in Cyprus (and Israel) over the next few years, a pipeline option to Greece and via Greece to Italy and the European market could become realistically feasible. Such a project though would still have to overcome major technical challenges due to the East Mediterranean's huge depth and the distance between Cyprus itself, the island of Crete and the Greek mainland. Similarly, initial thoughts to connect through a gas pipeline the island with the south Turkish coasts seem to be unrealistic as well, as long as a comprehensive settlement for the occupied northern part of the island can't be reached.

It seems that the only realistically feasible option for Nicosia is the collaboration with Cairo. In February 2015, Cyprus and Egypt signed a memorandum to explore the possibility of exporting gas to Egypt from "Aphrodite's" probable reserve, and in July 2015 the Egyptian side completed a pre-feasibility study on the cost of a potential pipeline connecting Egypt with "Aphrodite". The cooperation between the two countries was sealed in October 2016 after the meeting their leaders had in Cairo, in presence of the Greek Prime Minister A. Tsipras. The plan is not an easy one to complete², but it seems that the three countries are determined to proceed to it.

The possibility of a Turkish military strike against Cypriot LNG facilities or against the International Oil Companies (IOC) exploring the republic's hydrocarbon resources is not

¹ The northern third of the Republic of Cyprus is still occupied by Turkey after 42 years, a fact that both the US and the EU seem to forget.

² Theodoros Tsakiris. "The Gifts of Aphrodite: The Need for Competitive Pragmatism in Cypriot Gas Strategy." The S. Daniel Abraham Center for International and Regional Studies, February, 2016.

perceived as a serious risk by Nicosia nor Athens. Turkey will probably try to increase its diplomatic and economic pressure on the interested state parties, the EU and the IOCs that are involved (or are willing to get involved) in Cyprus. As Dr Th. Tsakiris argues, Nicosia will face a difficult diplomatic puzzle if Ankara decides to initiate its own exploration efforts in the occupied territories and waters of northern Cyprus in an attempt to counterbalance diplomatically the progress already made by the Republic of Cyprus since 2011.

Egypt: Egypt can have reasonable ambitions to become a gas hub for the Eastern Mediterranean countries and be the second, after Turkey, most important energy player in the region. “Discovering “Zohr” has not only altered the realities of Egypt’s domestic gas market, but has also forced its neighbors to revisit their own gas exploitation plans”¹.

Cyprus and Israel originally hoped to export some of their gas to Egypt for local consumption. However, with the “Zohr” discovery, such additional supplies will not be needed and both countries have been forced to seek out other options. As gas prices fell, Cyprus has indicated that its original plans to exploit “Aphrodite” gas are likely to be altered. In February 2015, Cairo signed a memorandum of understanding with Nicosia to transport potential production from the “Aphrodite” field. On August 31, 2015 Egypt and Cyprus signed a preliminary deal for an underwater pipeline. For Egypt, the deal is part of a broader strategy to position itself as a hub of energy development and consumption which envisaged starting production in 2020, via offshore pipelines directly to its mainland for re-export. Similar agreements were signed by Egypt and Israel. Re-exporting Israeli gas from the “Tamar” and “Leviathan” fields via Egyptian LNG is also a possibility, particularly given the existence of pipelines that already connect the two countries².

In addition to the military cooperation agreements signed with Cyprus and Greece, Cairo implemented some important defense contracts with France, Saudi Arabia and USA in an effort to modernize its armed forces and mainly its Navy. On June 17, 2015 two FPBG Ambassador Mk III type, built in the USA, arrived in Egypt. Two others were delivered in 2014. On June 23, 2015 the French FREMM class frigate “Taya Misr”, formerly “FS Normandie”, was officially received by the Egyptian Navy. Egypt has also ordered from France four corvettes Gowind 2500. The first one is planned to be launched on 2018 and will be built at Lorient shipyards, while the rest three in Egypt. Finally, on September 23, 2015 Cairo and Paris agreed on the delivery from France to the Egyptian Navy of two Helicopter carriers LHD Mistral type, initially intended to be sold to Russia. The first one was delivered on September 2016 and the second one will arrive in Alexandria in 2017.

These moves should be seen in association with the completion of the New Suez Canal Project in August 2015; its \$8 billion development cost was entirely financed by the Egyptian government. The new routes expanded the Canal’s capacity to 97 ships per day, and will gradually allow Egypt’s government to turn the whole Canal Zone into a giant commercial, logistical, ship-servicing and manufacturing hub.

The discovery of the huge “Zohr” gas field arrived on the right time to verify Egypt’s position as a powerful stability factor in the region and confirm President Abdel-Fattah al-Sisi determination “to solidify Egypt’s Democracy by strengthen its economy and defeat the terrorism.”

Greece: Greece has a long history within the Western geopolitical system and serves as a key strategic point for both the EU and NATO. The country forms Europe’s South Eastern flank and

¹ Carole Nakhle, “Egypt Discovery Transforms Petroleum Outlook in Eastern Mediterranean.” Op-Ed August 16, 2016, The Lebanese Center for Policy Studies

² “Two of its neighbors, Cyprus and Israel, making use of Egypt’s existing LNG facilities is a far better option than sinking the capital required to build new ones”. “Egypt: The Eastern Mediterranean’s Next Natural Gas Hub?” STRATFOR Analysis magazine. <https://www.stratfor.com/analysis/egypt-eastern-mediterraneans-next-natural-gas-hub>, September 5, 2016.

its long eastern borders are exposed to the volatile conflicts that unfold in North Africa and the Middle East. According to Admiral J. Stavridis, former NATO Supreme Allied Commander Europe, "Greece occupies a remarkable geopolitical position as a solid southeastern anchor to the NATO Alliance. The bases on Crete are particularly critical when looking at the instability in the Levant"¹. As seen in figure 2, its strategic location allows easy access to most of the hot spot in the vicinity².

Despite the ongoing financial difficulties, Greece is determined to defend its national interests. By dedicating important assets to Hellenic Navy is seeking the maximum availability of existing instruments and full coverage of surveillance needs, upgrades its underwater fleet capacity and completes all the remaining shipbuilding programs³. Admiral E. Apostolakis, Chief of the Hellenic National Defense General Staff, has repeatedly confirmed that the current financial crisis has not affected the readiness and capabilities of the Hellenic armed forces; Greece maintains its military power and is ready to confront any threat when needed. ISIS, the civil war in Syria and the state of anarchy prevailing in Libya have caused a humanitarian crisis as well as a serious security issue not only for Greece but also for Europe, Middle East and North Africa. The Hellenic Ministry of National Defense should now find the means to gradually increase its military presence in Crete by deploying a small naval task force⁴, two or three Special Forces units, further explore NMIOTC training capabilities and strengthen NATO's presence in the area⁵.

In addition to its openly declared position to deter every aggressor from any territorial claims, we think that Greece has to focus its diplomatic efforts towards two goals:

- Expand and intensify the already developed trilateral alliances with Cyprus, Egypt and Israel in order to be able to explore the possibilities of cooperation in the energy domain and strengthen its economy.
- By traditionally defending International law, building regional alliances, being an EU member and investing on its traditional good relations with the Arab community, Greece has the legitimacy to be the credible mediator between all the actors in the region. Athens should invest in this image, insist and invite Turkey to participate as an equal and honest member of a broader cooperation. The sensitive balance between enmity and amity should be gradually tilted towards the later and change the traditional rivalry behavior patterns. Exploring the recently discovered energy fields constitute a strong motive to all parts.

¹ Dr. Daniel Goure. "Souda Bay: NATO's Military Gem in the Eastern Mediterranean" Lexington Institute, March 2016.

² Souda Bay closely located to Hotspots: Suez Canal 575 miles, Israel 650 miles, Lebanon 675 miles, Black Sea 690 miles, Egypt 716 miles, Libya 752 miles, Syria 1200 miles, Iraq 1553 miles. Dr. Daniel Goure. "Souda Bay: NATO's Military Gem in the Eastern Mediterranean" Lexington Institute, March 2016.

³ In April and October 2014 one (1) modernized 209 type and three (3) new 214 type submarines joined Hellenic Fleet's submarine flotilla. The new FPBG Vosper class HS RITSOS was commissioned in January 2016 and two similar class FPBGs will reinforce the Hellenic Fleet in 2017 and 2018. In 2017 the first out of four (4) modernized MPA's will be operational.

⁴ A Naval group composed by two or three frigates, one submarine, one LPD and one General Support Ship.

⁵ In 2015, the Greek Minister of National Defence, Panos Kammenos, proposed the creation of a new NATO air base on an island in the Aegean in conjunction with the naval base at Souda Bay to facilitate the battle against ISIS, and called for cooperation between Egypt, Cyprus, and other Middle Eastern countries to fight the terrorist group.

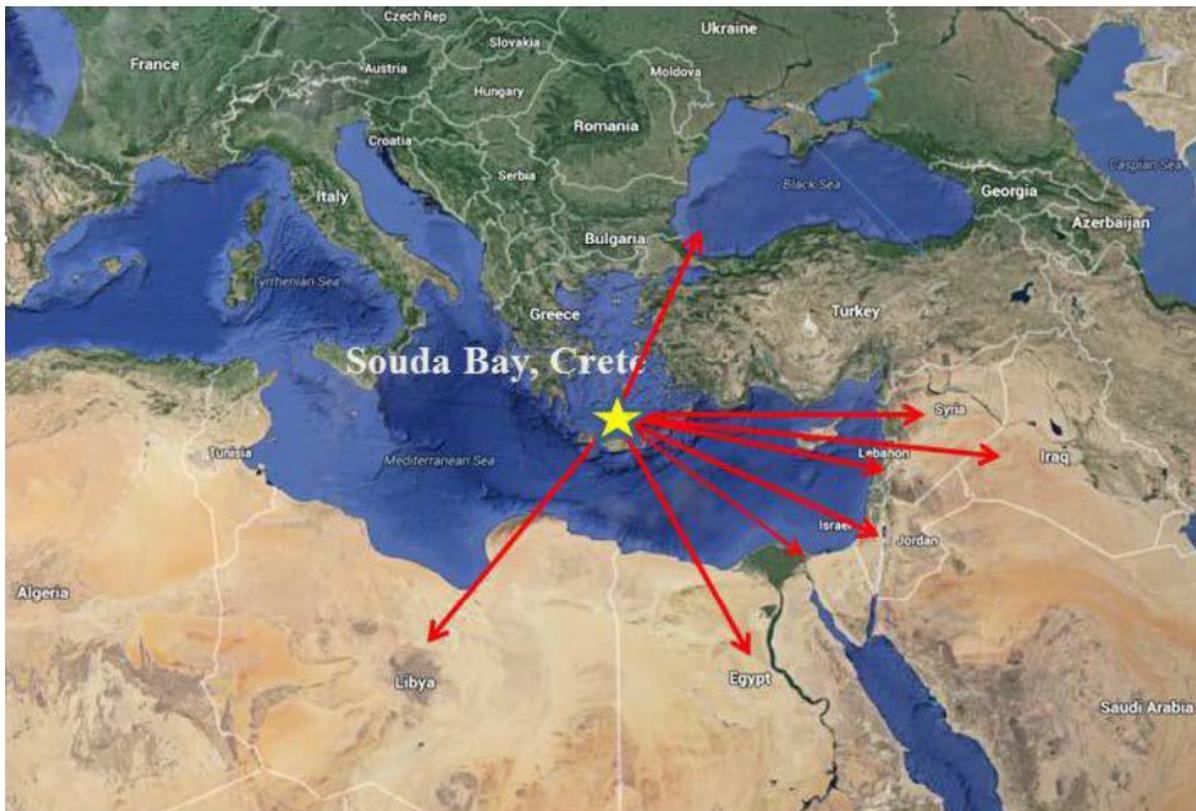


FIGURE 2. Souda Bay and Crete's Strategic Position¹

Israel: Since its creation Israel has been the closest USA ally in the Eastern Mediterranean area and the Middle East. Jerusalem's foreign policy has been always characterized by caution, determination and a pro-Western agenda. The political instability in the Eastern Mediterranean over the last years has rewarded this prudent and vigilant strategy.

As aforementioned, Israel has signed important cooperation agreements with Cyprus and Greece which allow the conduct of an indirect dialogue between Jerusalem and Cairo. In addition to those agreements, a similar strategic cooperation should be signed directly with Egypt too. Although not declaring it publicly both countries political and military leadership are trying to overcome the deeply rooted contradictions of their societies and engage into a closer cooperation. In fact, an agreement of such magnitude can't be imposed from top to down. It is paramount to be accepted by their citizens and that's were Cyprus and Greece can play a facilitator role.

Containing radical Islam is the main pylon upon which Jerusalem and Cairo can found common ground and move closer. The relations between the two countries have seen a noticeable improvement following the expulsion from power of Mohamed Morsi, as President Sisi's determination to confront with terrorism offers the right political signs to Jerusalem. Energy is another equally important pylon of this common ground. For Israel, as for every country in the region, the discovery of hydrocarbons has created an opportunity for increasing regional economic integration. Israel's initial ambition was to export gas to Europe, his biggest trade partner, by using Turkey's soil and pipelines as the most efficient route to the European market. The rapid deterioration of relations between Jerusalem and Ankara since 2010 obliged the first to

¹ Dr. Daniel Goure, "Souda Bay: NATO's Military Gem in the Eastern Mediterranean Lexington Institute, March 2016".

align its efforts with Cyprus and Greece. Both countries are EU member states and energy cooperation with them can be a profitable partnership. While [there are no guarantees](#) that the under discussion pipeline connection will work, Israel's actions reflect a determination to enhance this partnership. Signing the EEZ delineation agreement with Cyprus in 2010 and the deepening of the agreement with Cyprus and Greece in the domains of trade, tourism, environment and security in addition to the energy domain verify it. As mentioned earlier the "Zohr" discovery has changed the initial plans. Utilizing [Egypt's LNG plants](#) seems to be a more reasonable solution and a natural-gas deal can provide not only diversify and strengthen the relationship, but can also bring an economic boost for Israel and Cyprus as well¹.

Alongside with the signed agreements Israel is investing in security by increasing its own military capabilities. Although a close cooperation with the Hellenic Navy is being materialized, significant procurement and modernization programs aim to gradually increase the country's naval capabilities to the level of its air and army power. The mid-life modernization program for its three Sa'ar 5 class corvettes is underway and a new program of building four new Sa'ar 6 class corvettes from Germany has been signed. The eight Sa'ar 4.5 class FPBG modernization program started this year and Israeli's submarine fleet will be soon, by the end 2017, reinforced with three Dolphin II class Air Independent Propulsion technology submarines.

Turkey: Turkey is the biggest economic and military power in the region. It is considered to be the bridge between East and West and it's NATO's South-eastern border. She is the country with physical borders to Russia and the three of the most unstable countries in the rich in energy Middle East region, Iran, Iraq and Syria. From 1945 to 1991, Turkey was a key factor to the USA containment strategy against the Soviet Union due to its control of the Bosphorus strait.

The clear and relatively simple foreign strategy followed by Ankara until 1991 started to dissolve following the fall of the Soviet Union and took a completely different orientation in 2003 after the U.S. invasion of Iraq. From Turkey's point of view, the invasion was unnecessary, threatened to empower Iran, and by reintroducing and reinforcing the national aspirations of the Kurdish population in the area impose the country to serious domestic and internal political challenges. For the first time since 1945 Ankara not only refused to participate in an U.S. initiative, but also prevented the Americans from using Turkish territory to invade Iraq.

Turkey is emerging as a significant regional power and after the transformation of its ties with the U.S.A. it can consider developing relationships with other regional and non-regional actors. Turkey gradually improved its relations with EU², Russia, China and Iran mainly by taking advantage of its strategic geographical location and the energy routes that connect East with Europe. The country is currently in a transitional stage for a variety of reasons which include limited democratic legalization and serious questions on the country's democratic quality and the independence of judicial and media independence³, primitive and authoritarian institutions in managing regional affairs, an international community unwilling to accept Turkey as a major power with the right and the ability to support regional interventions, a region biased by old prevailing rivalries not yet prepared to view Turkey as a beneficial and stabilizing force and Ankara's aggressive leadership attitude. Turkey's new strategy is shaped by the following realities:

¹ "LNG has become extremely costly to develop even for Israel, which has the necessary reserves to build a commercially viable two-train LNG export facility. Unless new discoveries are made, a combination of pipeline and LNG exports is no longer a viable option for Israel or, for that matter Cyprus, or Cyprus and Israel together." Theodoros Tsakiris. "The Gifts of Aphrodite: The Need for Competitive Pragmatism in Cypriot Gas Strategy." The S. Daniel Abraham Center for International and Regional Studies, February, 2016.

² Turkey failed to integrate with EU for a host of reasons, the hostile relations with Greece and Cyprus, Europeans fears of massive Turkish immigration, reluctant adaptation to the European values.

³ Roy Karadag, "No True Democracy in Turkey without Peace", Carnegie Europe, <http://carnegieeurope.eu/strategieurope/64964>, October 27, 2016.

First, the country is rapidly developing demographically and economically and has the most powerful military in its region. Second, its frontiers are surrounded by increasingly unstable and dangerous neighbors. Third, although not encountering any immediate existential external threats, Turkey is facing a serious internal security problem with the Kurdish irredentism¹. Fourth, the long existing tension between the secular and the religious elements inside the Turkish society and the struggle to redefine its political and cultural identity regarding its position towards Islam is dominating its internal policy.

In a region of unstable powers, Turkey's relative strength is increasing thus providing Ankara with new options. It is one of the two (the other being Egypt) most important energy, oil and gas, hub in the high turbulent area of the Middle East and has the potential to play a leadership role in security, trade, economy and energy domains². However Ankara so far has not been established as proper energy leader in the region. It is reluctant to accept the International Law fundamental basis and the core western value that international actors negotiate on equal terms and common interests. "Instead, the country's actual foreign policy behavior is closer to a securitization strategy. It is less interested in gathering followers to work towards a shared objective than in exploiting the leverage gained from energy governance for other political purposes"³. This policy, which is rooted in old imperial attitudes coming back from the Ottoman Empire period, generates doubts to its neighbors regarding its real plans and turns them from potential allies to clear opponents. Ankara has to abandon rhetoric and actions that question the sovereignty of its neighbors and try to gradually create relations of trust based on the International Law⁴.

On the other hand it is for everybody's interest to engage Turkey in a way that its strategic link with Europe and the West is not broken. Turkey is a too valuable actor, an important ally to the West and is already being destabilized by the Kurdish issue, the war on ISIS and the internalization of Middle Eastern instability. "In a not distant future, it could become a gateway of Middle Eastern instability to Europe. It is in the interest of virtually all regional stakeholders, both friends and rivals, to avoid a further "Middleeasternization" of Turkey"⁵.

Political Prospects and Challenges

The improvement in relations between Greece and Israel which started in 2010 and gradually included Cyprus and Egypt constitutes for all four countries a win-win situation. 2016 has been characterized by an unprecedented diplomatic activity between the four capitals, a reality that

¹ The Kurdish problem is perhaps the only issue that can cancel Turkey's efforts to become a regional great power as it intersects with interests and balances not controlled by Ankara. For example, the question of Iraq's and Syria's future and the extent of autonomy the Kurdish region will enjoy will definitely have an effect on Turkish Kurds.

² In October 10, 2016 President Erdogan and his Russian counterpart, Vladimir Putin, signed an agreement on the Turkish Stream gas pipeline, which will bring Russian gas to Turkey and onward to the EU. "Turkey, Russia, and the European Diplomatic Chessboard" Posted by: [Marc Pierini](#) Monday, October 17, 2016.

³ Jörn Richert, Turkey's Energy Leadership Ambitions and Their Implications for Energy Governance in the Eastern Mediterranean. The S. Daniel Abraham Center for International and Regional Studies, February, 2016.

⁴ It is a painful and long procedure. Greece can be Turkey's main ally in this effort. Its honest and open attitude after the recent military coup proves it.

⁵ Emiliano Alessandri, "Scenarios for the East Mediterranean: The Pessimistic / Catastrophic Outcome" "The East Med in 2020: Possible Scenarios and Policy Recommendations" ELIAMEP Policy Paper, April 2016.

suggests the emergence of a new geopolitical partnership in the region. This new partnership has political, economic and security significance, and although it was initiated by the need to counterweight Turkish ambitions it should not be perceived as such. Economic opportunities created by the discovery of hydrocarbons are the primary reason for Cyprus, Egypt, Greece and Israel recent closer partnership. There is no doubt that these dynamics have been built by each country's ongoing tensions with Turkey. However, the energy field can have great integrating powers and would serve to alleviate some of these disputes. If handled in the right way, energy policy can create important geopolitical synergies, which can serve not only to mitigate conflict, but to actually provide a solid basis for long-term cooperation and economic development in the region. We strongly believe that if all countries want to prosper, energy ambitions should be seen as an opportunity of cooperation and not confrontation. Turkey is a significant actor and could be an equal party and valuable ally in this process of economic integration, but has yet to demonstrate the will to abide with the International Law and the necessary flexibility to reach an honest settlement with its neighbors.

EAST MEDITERRANEAN PERSPECTIVES AND ITS IMPORTANCE TO GREECE

Starting from the year 2.000, several offshore Exploration and Production (E&P) contracts have been signed between several oil companies and countries like Cyprus, Egypt and Israel (Noble Energy, Delek, Avner, BP, SHELL, TOTAL, ENI, etc). These contracts defined the technical, economical and legal rights provided to the oil companies in order to locate, find, develop and produce oil or gas from the oil fields discovered into the contractual concession areas (Blocks). Till September 2015 companies' exploration investments allowed oil companies to discover important gas fields like "Dalit", "Tamar", "Leviathan" and "Aphrodite" to localize some similar geological drilling targets (Fig.1). All these field discoveries concerned sandstone reservoirs. Apart these sandstone reservoir plays, a new limestone reservoir play emerged very recently - beginning September 2015 - thanks to ENI's supergiant biogenic natural gas discovery, the "Zohr" gas field (Fig.1). These new plays lead not only to a great commercial success but also to a scientific one, in the sense that has shown us possible presence of further new giant exploration biogenic gas targets offshore Cyprus, Greece, Egypt, Lebanon and Israel. All these perspectives could in the long term improve above countries economics and energy security of supply and in parallel contribute to the security of natural gas supply of the European Union.

Concerning Egypt with its 80 million inhabitants, and Greece with its 11 million inhabitants, it is interesting to notice that they have about the same annual gross domestic product (GDP), i.e. round 235 billion €. In parallel in the middle of a serious global economic crisis Greece is struggling in a perplexed way to survive and not to collapse financially. In the opposite Egypt following a specific strategy plan, took care in time of energy matters early on and managed through a specific exploration schedule to discover in September 2015 a real treasure, the supergiant "Zohr" biogenic natural gas field. This was of course realized thanks to the Italian company ENI and through this specific discovery the Egyptian economy and the Egyptian internal energy problems have been nearly both solved.

"Zohr" is located 150 km from the Egyptian sea shore at sea water depth of 1.450 meters, and his production will require ENI to drill several wells in 4.300 m drilling depths below the sea bottom. Field development investments could reach around \$12 billion. "Zohr" limestone reservoir gas water contact touches the point of Egyptian offshore EEZ sea boundaries with the Cypriot ones and is estimated to contain recoverable proven reserves (with 90% probability) of approximately 26 trillion cubic feet (Tcf), while the Egyptian state company E-GAS estimated recently total possible reserves (with 10% probability) being about 60 trillion cubic feet. ENI has

stressed that - from a geological point of view - this kind of giant biogenic gas discovery trapped into a karstified limestone reservoir (reef), was something that happened for the first time in the Mediterranean Sea. In order to locate the “Zohr” discovery, ENI used his experience from an analog previous identification case in Venezuela, the “Perla” biogenic gas field. “Perla” gas field - the biggest South American one - was discovered in 2009 with total in place reserves of about 17 Tcf. Paleogeographically the “Perla” structure was created in a similar to “Zohr” way at the edge of an extremely salty paleo-lagoon during the miocene era, actually is located near the well known as “Maracaibo Lake”.

Recent studies of the University of Columbia (Fig. 3, William Ryan, 2008) and studies from the Netherlands Utrecht University showed the existence of analog to the Zohr biogenic gas field geological areas. These specific geological sites could be part of Miocene age paleolagoons created during late Miocene age in the East Mediterranean region.

We believe that these areas should receive special exploration attention because they have reasonable chances to include important strategic biogenic natural gas reserves trapped into karstified limestone reservoirs. We observe that the areas south of Crete are particularly very interesting areas for further oil and gas exploration. Karstified gas reservoirs have significant advantages over other kind of classical reservoirs. As an example the Egyptian “Zhor” Gas Field covering an area of 100 square kilometers (km²) contains 26 Tcf. Compared to the Cypriot Sandstone one Reservoir - the “Aphrodite” gas field - covering also a similar area of 100 km² with recoverable reserves 5 times smaller, about 5 Tcf. High gas productivity per well is another important factor related to the economics and the commerciality of this kind of reef type gas fields.

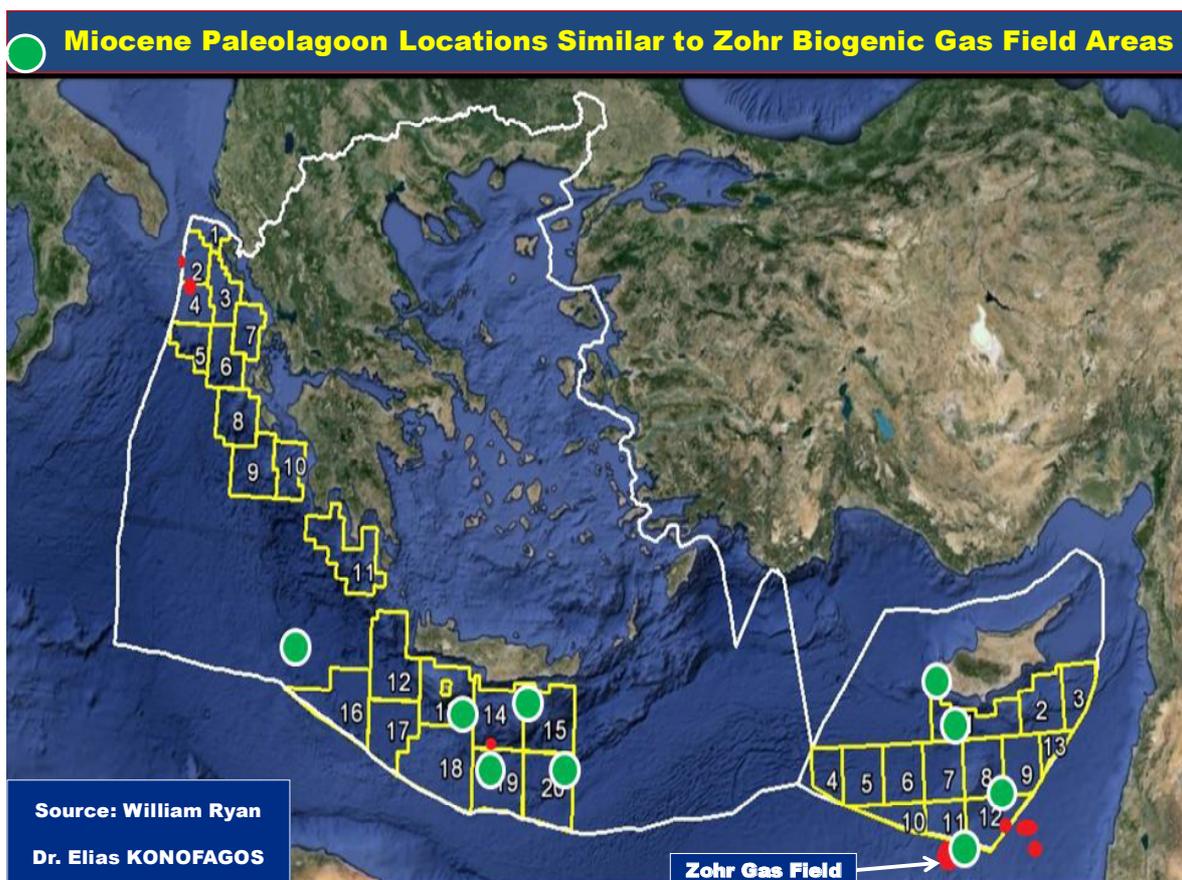


FIGURE 3. Miocene age paleolagoons locations.

The above observations showed us the importance on identifying biogenic natural gas accumulations - in the East Mediterranean region - trapped into karstified limestone reservoirs against the classical perception on localizing pyrolitic natural gas deposits into sandstone reservoirs. Localization of such reservoirs need advanced technology models based on high quality offshore 3D Seismic recordings. We must therefore notice that there is an urgent need - specially from the part of the Greek State - to take a new positioning related to hydrocarbons exploration and production concessions strategy into the Greek deep sea waters. This strategy should have as its ultimate goal to attract major oil companies, which could invest the necessary funds with the main aim to efficiently localize strategic gas reserves into the Greek EEZ through a new exploration model similar to the one suggested by the Italian Company ENI.

We see therefore that, based on Greek domestic natural gas prices, the Egyptian supergiant "Zohr" gas reserves exceeds the gross value of 260 billion €, which represents at least the annual gross national product of Greece or Egypt. Based on all the above, we wonder with some surprise, that a country like Greece, which actually lives on imports of goods, is still hesitating to develop a strategic plan similar to what Egypt has already opted for: creation of Mineral Wealth. A new Greek Exploration Strategy must be created taking into account that geologists are already aware, that exploration priorities and methods in the East Mediterranean regarding giant discoveries of biogenic gas reserves have very recently changed radically. Despite the presently very low oil prices in the International market and taking into account that oil and gas offshore exploration and production campaigns last for decades, it is about time for the new Greek government to become alert and attempt to attract appropriate investors in a new strategic spirit, as Cyprus, Egypt and Israel have already done so effectively in the past. The most promising area for discovering new gas reserves in the region seems to be the south of Crete area, where major geological biogenic accumulation targets - similar to that of the supergiant Zohr gas field - could be discovered.

TECHNICAL PRODUCTION COST OF THE EAST MEDITERRANEAN GAS FIELDS

When an oil company makes a natural gas field discovery into a specific offshore concession block he has at first to determine if his find is a commercial one. Commerciality depends not only on the technical characteristics and the amount of gas reserves discovered but also on the contractual terms signed between the oil company and the host country (production sharing terms or royalty + tax terms) and of course on the current, medium term and expected long-term gas prices. Very recently (between 2011 and 2016) we have experience an important collapse of the gas prices in the international market of about 50% (Fig. 4). Taking into account this recent collapse of gas prices it remains interesting to investigate if offshore deep or ultra deep (1.500 m sea water depth) east Mediterranean recent or expected future discoveries can remain commercially attractive for the International Oil Companies (IOC's) in the region for the medium & long term future exploration campaigns.

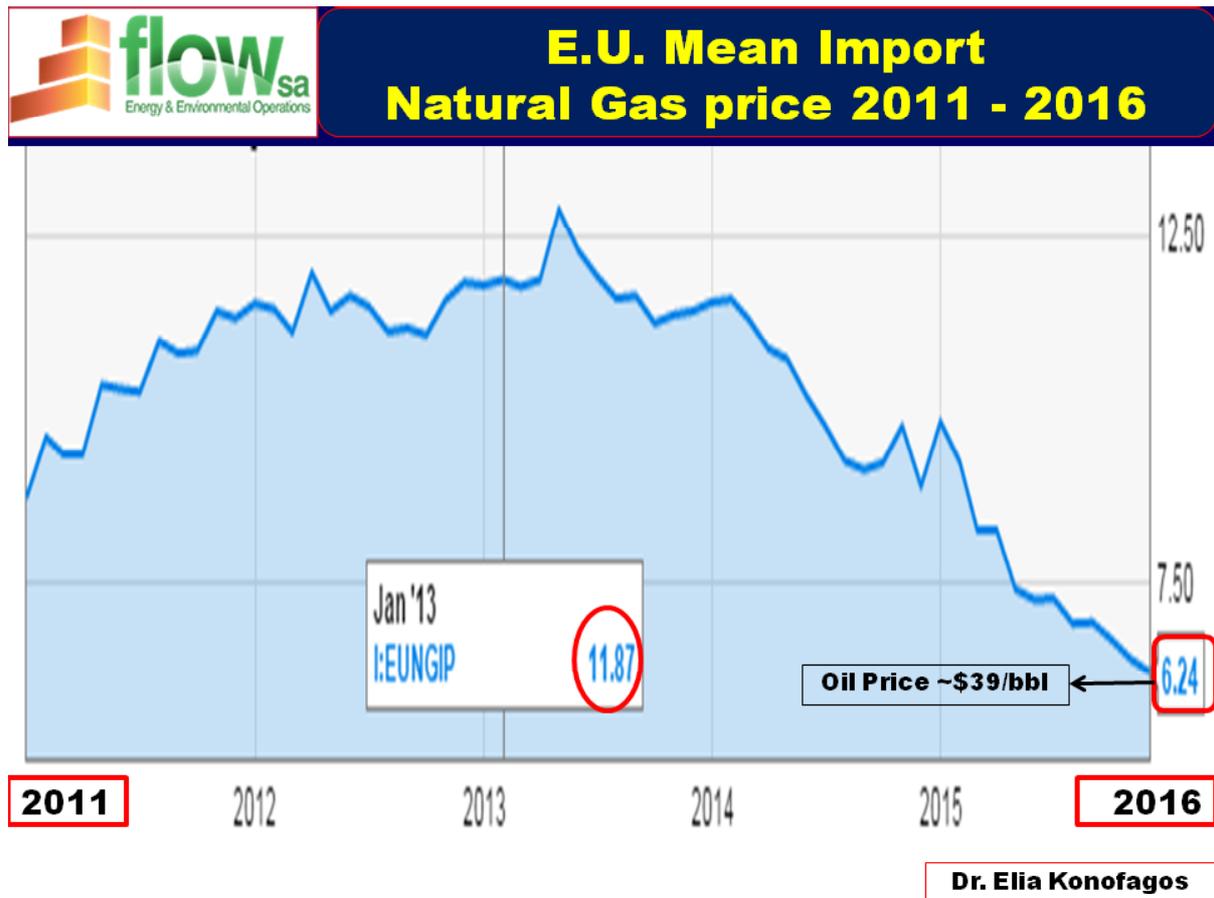


FIGURE 4. EU Mean Import Natural Gas Prices 2010 - 16

Apart the above considerations on commerciality following a gas find in the east Mediterranean region, countries like Cyprus, Egypt and Israel have at first to attract experienced and wealthy investors offshore in order to locate, drilling, develop and produce hydrocarbon accumulations. So the most important factor in attracting investors for such objectives is the expected level of the “Technical Production Cost” in the region for finding, developing and producing such sandstone or limestone gas reservoirs. “Technical Production Cost” (T.P.C.) is a cost - before royalty, taxes or profit - which includes financing costs and which is usually expressed in \$/Mcf (dollar per thousand cubic feet) or in \$/boe (dollar per barrel of oil equivalent) and which is defined as the ratio of the overall investments for finding, develop and produce a natural gas field divided by the total expected recoverable gas reservoir reserves:

$$T.P.C. = \frac{\text{Total Cost (F\&D Expenses + OPEX)}}{\text{Total Recoverable Reserves}}$$

F&D = Finding & Development
OPEX = Operating Expenses

Taking into account that all existing technical and economic information on gas fields already developed (“Tamar” gas field), fields under development (“Zohr” gas field) or to be discovered and developed in the region, we have assessed the order of magnitude of the technical production costs level of all these gas fields. The annual operating expenses were estimated being from 8%

to 12% of the total find and development expenses. The commerciality of these fields depends of course from the level of technical production cost achieved by the IOC's but also from the level of gas prices guaranteed by the contract signed between the state and the operating oil companies and from the relevant production sharing terms (or royalty + tax terms) included into the same concession contract.

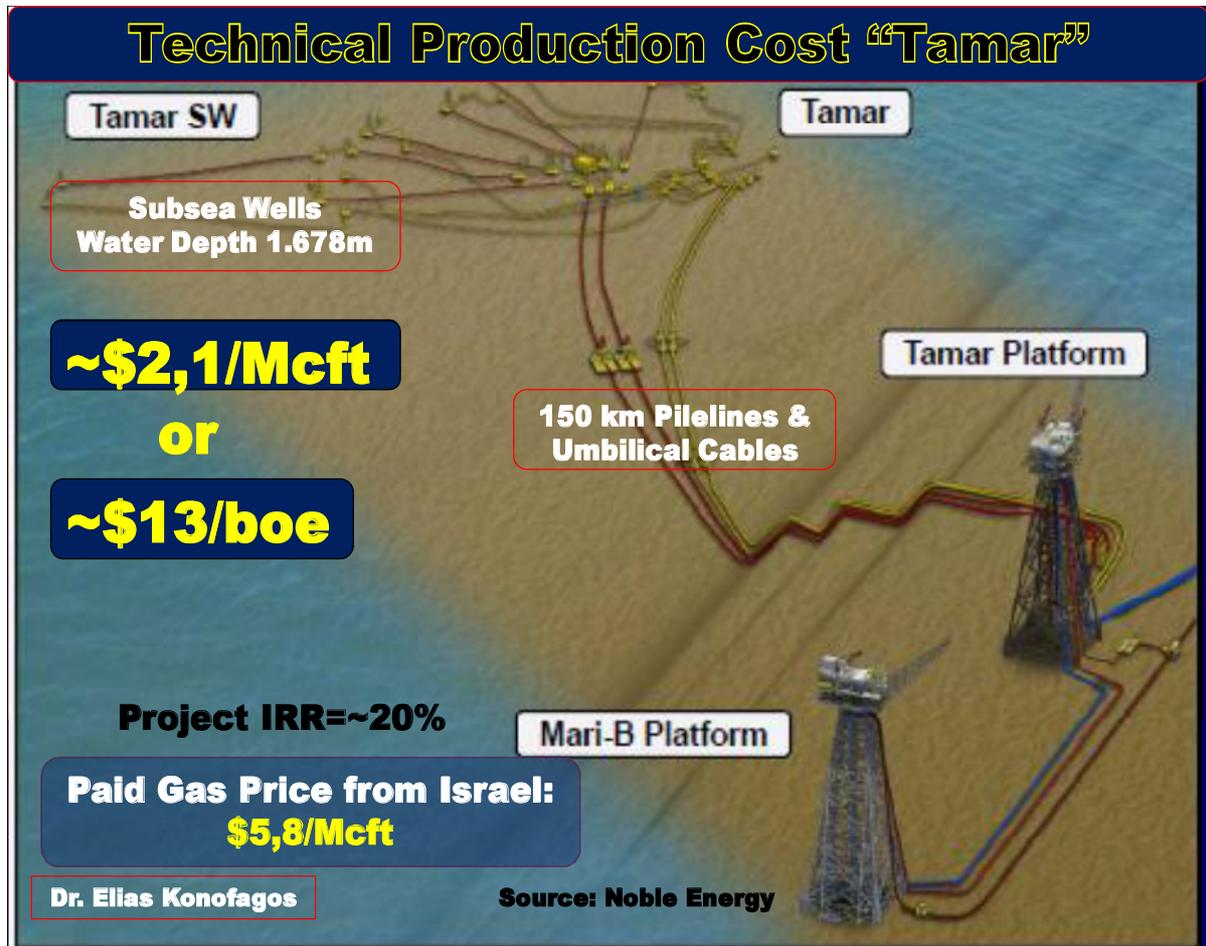


FIGURE 5. "Tamar's" Technical Production Cost

Today "Tamar" gas field with 8,4 Tcf recoverable reserves covers entirely Israel natural gas needs and will still secure his natural gas needs for at least 20 years long. The field located at 1.688 m water depth, was discovered in 2009 and started production only four years later, in 2013. Exploration cost reached before development ~\$1 billion and the field was entirely developed through subsea well heads and subsea facilities. Yearly production of 420 Bcf is carried out by using 7 wells connected by a 150 km long subsea double pipe tie-back to a gas processing Tamar steel platform located offshore Ashkelon near the Israeli sea shore (Fig. 5). Finding and Development (F&D) cost reached ~\$6 billion. Unmanned field production management ensured through 240 km subsea steel tube umbilical's guided from Tamar platform operating rooms. Annual operating costs were estimated at about \$600 million.

Based on the above data "Tamar" technical production cost was evaluated at a level of ~\$2,1/Mcf or ~\$13/boe. Taking into account that the Israeli government buys the "Tamar" gas at a price of ~\$5,8/Mcf and that contract terms provide for a 66% royalty plus tax share for the Israeli state, we have calculated that project's Internal Rate of Return (IRR) could reach ~20% (Fig. 5).

Development of the supergiant gas field “Zohr” by the Italian company ENI, received a few weeks ago the green light by the Egyptian government. “Zohr” is located in water depth of ~1.500m into the “Shorouk” Block 9 (Fig. 3) and the field is expected be developed in three phases (Fig. 6).

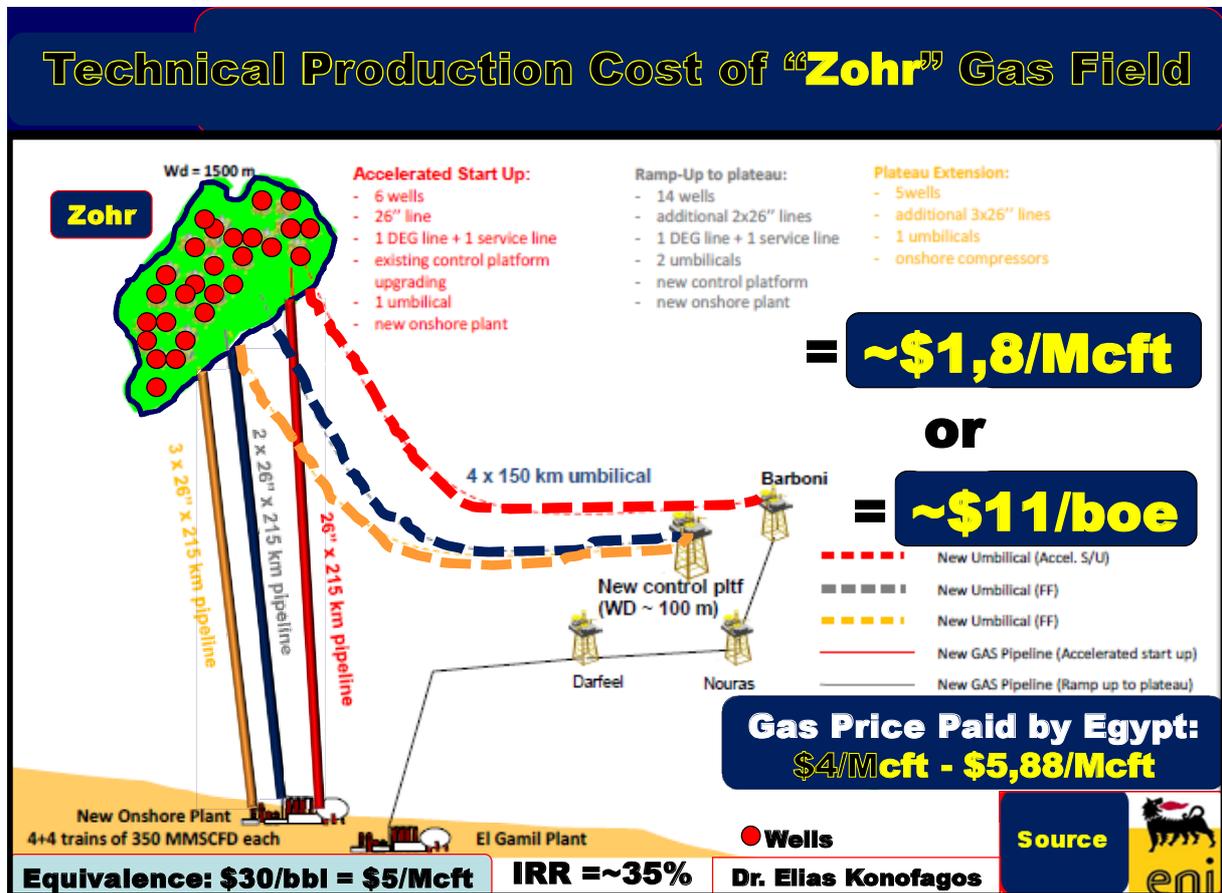


FIGURE 6. “Zohr’s” Technical Production Cost

ENI planned to develop the 26 Tcf field gas reserves without using any floating processing units (like in the “Tamar” case). Full yearly production of 900 Bcf will be assured by using 26 wells and by conveying the gas to shore through three 215 km long subsea pipelines. According to ENI sources, investment for developing this field could reach a total amount of ~\$9 billion. Nevertheless taking into account that well tests have shown recently presence of H₂S (hydrogen sulphide) into this biogenic lean natural gas, we have provided a much higher development costs of about ~\$11 billion. Field unmanned production will be managed by subsea steel tube umbilical's, guided from a control room to be constructed on a pretty new fixed steel platform located at 100 meters water depth near the Egyptian sea shore. Yearly operating costs were considered at ~\$1,1 billion.

Based on the above data “Zohr” technical production cost could reach ~\$1,8/Mcf or ~\$11/boe. Taking also into account that the Egyptian government is committed contractually to buy the “Zohr” natural gas at prices being between \$4/Mcf and \$5,88/Mcf, a \$5/Mcf price case brings “Zohr” project IRR at a ~35% level. This IRR was calculated by taking into account a 65% - 35% production sharing term, condition that has already been agreed and signed between the Egyptian government and ENI (Fig. 6).

Taking into account that in the medium term new natural gas discoveries could also occur south of Cyprus and south of the island of Crete, we have tried to see if smaller discoveries of about only ~2,5 Tcf recoverable gas (half of Cyprus “Aphrodite” field) at water depths of 1.500 m, could still be considered commercially viable in the region (Fig. 7).

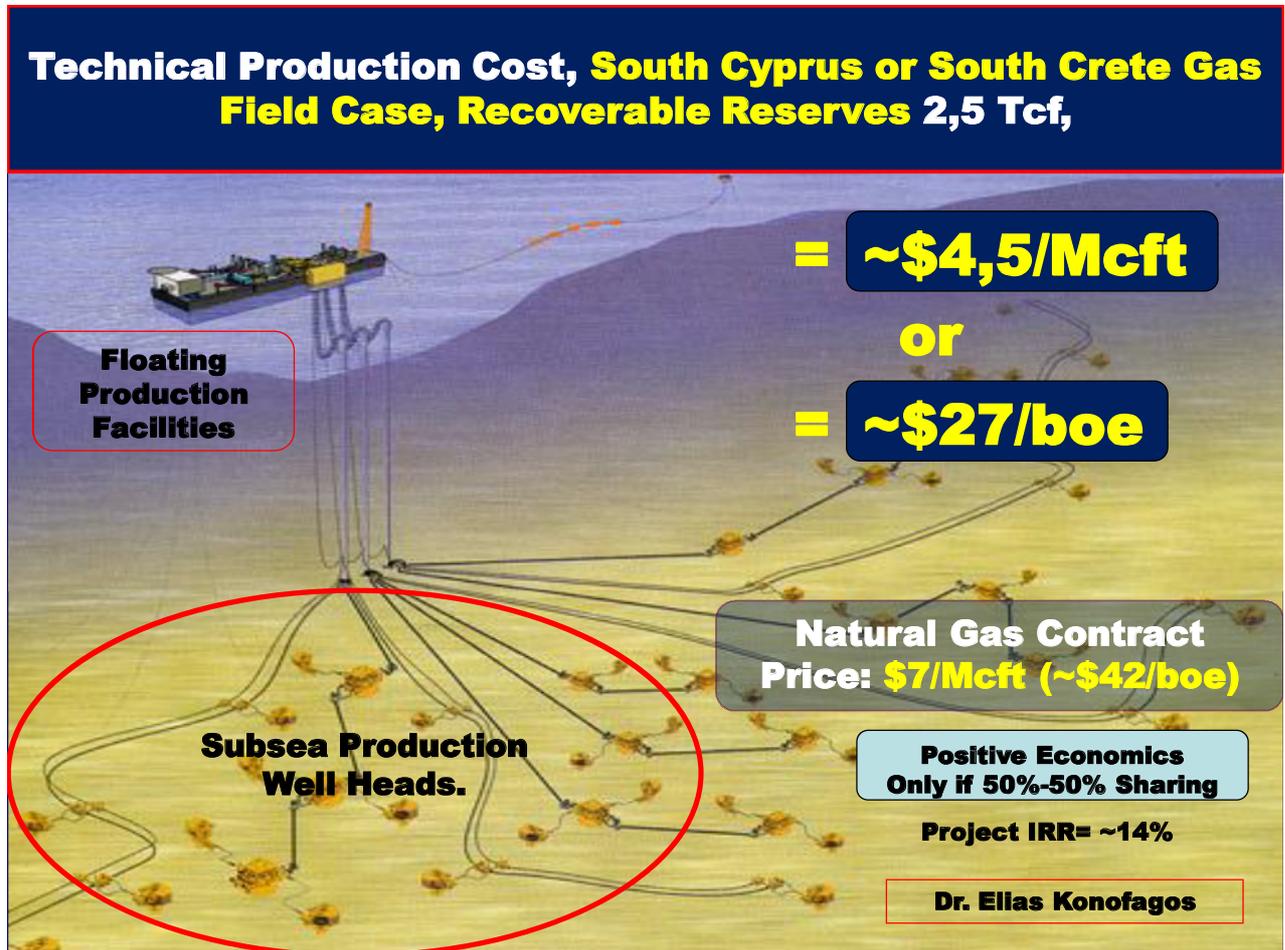


FIGURE 7. Technical Production Cost, Cyprus – south Crete

In order to minimize production investments we have considered development schemes using a combination of subsea production well heads, flexible production lines and floating production processing facilities. The gas was considered to be delivered by pipelines to shore at a distance of 70 km. Reservoir drilling depths were considered ~3.000m with a yearly production plateau reaching 150 Bcf. Mean finding and development cost of such a project could be of the order of \$4 billion accompanied by a yearly operating cost of ~\$360 million. Technical production cost was estimated at ~\$4,5/Mcf or \$27/boe (Fig. 7).

The economic analysis of such a case showed that this field can be considered commercially viable only if gas market prices could reach a level of \$7/Mcf and if Contractual terms could allow a production sharing of 50% for the state and 50% for the Company/ies. In such a case IRR could reach a level of ~14%.

Concluding giant field gas discoveries can have in practice very low technical production costs provided that productivity of the subsea development production wells are high and that an attractive natural gas market exists near the gas discoveries. The great difference between an oil

field discovery and a natural gas discovery is that in the case of an oil field discovery oil has the same price everywhere in the world. In the opposite natural gas prices depends on the distance of the natural gas discovery from his natural gas commercial delivery market.

CYPRUS 3rd ROUND AND EXPECTED HUGE PERSPECTIVES

On March 24th the 3rd Cyprus Licensing round was announced. His target was to attract new oil and gas exploration production investments from oil companies into the Cypriot blocks 6, 8 & 10 of the Cyprus EEZ. This event represents an important step for improving further the existing already positive economic development of the island (Fig. 8). This 3rd Cyprus licensing round was entirely based in the new geological exploration model which permitted to the Italian oil company ENI to discover the Egyptian supergiant biogenic gas field “Zohr” - only 6 months way - located in the Cyprus EEZ border with Egypt.

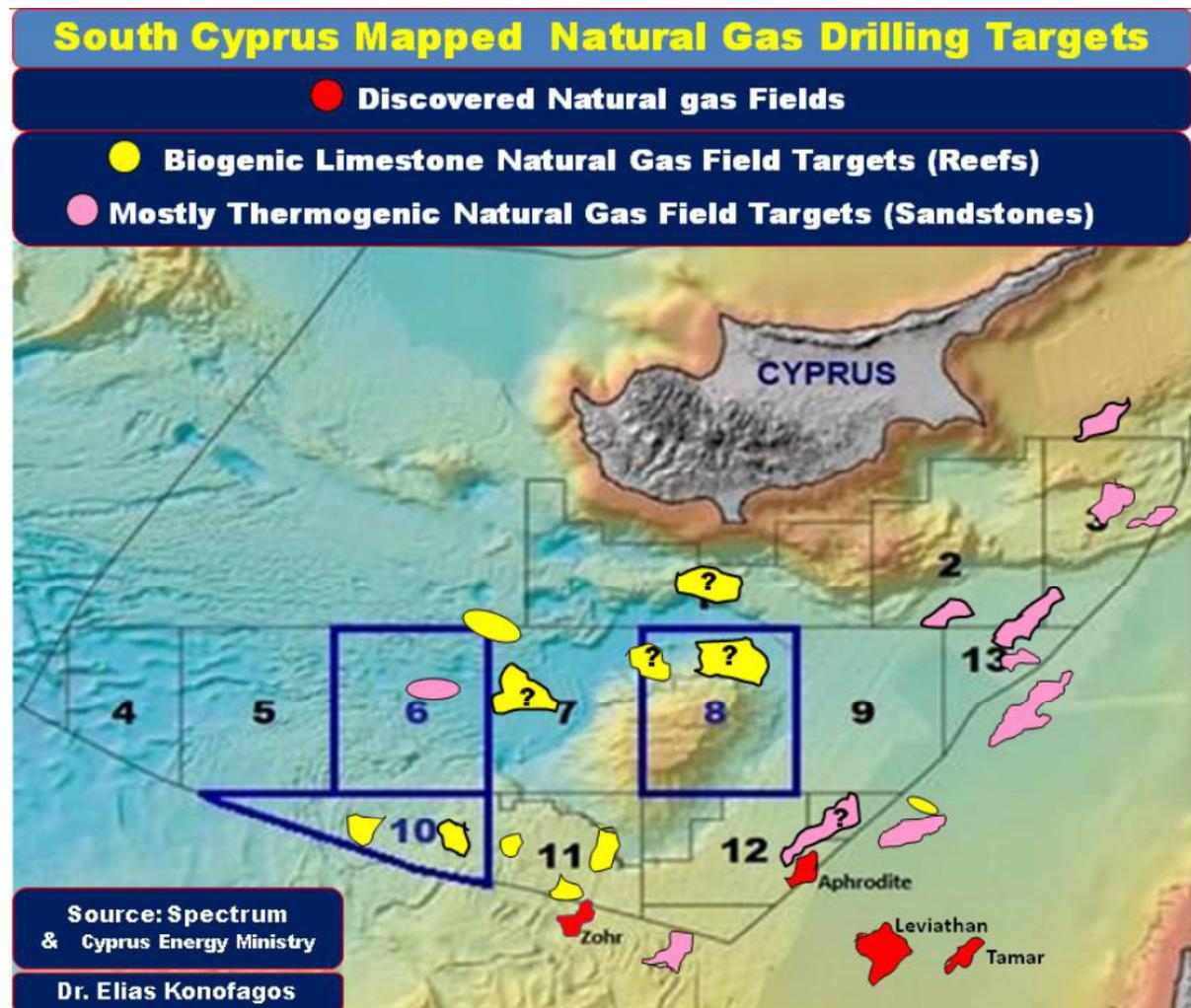


FIGURE 8. South Cyprus Mapped Natural Gas Drilling Targets

“Zohr” karstified limestone gas field is the biggest natural gas field in the Mediterranean and one of the biggest field in the world. Through recent publications we have shown that a certain

number of karstified limestone structures have been created in the edge of Mediterranean paleolagoons during the Miocene period. These Mediterranean paleolagoons fed these karstified reef type high porosity limestone reservoirs with biogenic natural gas. From a first analysis of a geophysical study published by the geophysical company Spectrum which has been conducted around south Cyprus subsea “Eratosthenes” sea mount area we have found that “Zohr” biogenic gas limestone reef type structure is not the last one but only the beginning of a series of at least 10 other similar structures. We have investigated more precisely to locate and map all these new limestone play structures (colored in yellow) into the south Cyprus blocks map. Yellow structures with question mark on them have to be studied further in order to confirm with more recent geophysical data closure existence, size and reservoir type.

From a first look on this map (Fig. 8) we have found that into the Cyprus block 10 two “Zohr” type structures are present and both of them seems to be bigger than the already discovered “Zohr” gas field. The block 11 includes also similar to Zohr type reservoir targets & one of them is expected to be drilled during the first months of 2017. Into the Block 7 a target 5 times bigger than the “Zohr” one has been identified. The government of Cyprus avoided including the Block 7 into the recent Cyprus licensing round possibly wanting to preserve this Block as a strategic natural gas reserve. We must also notice that a big sandstone type reservoir target exists into the Cyprus Block 6 and his size is about the one of Leviathan gas field. Of course more accurate existence of all the above targets will be investigated further from the oil companies through seismic 3D recordings and by exploration wells.

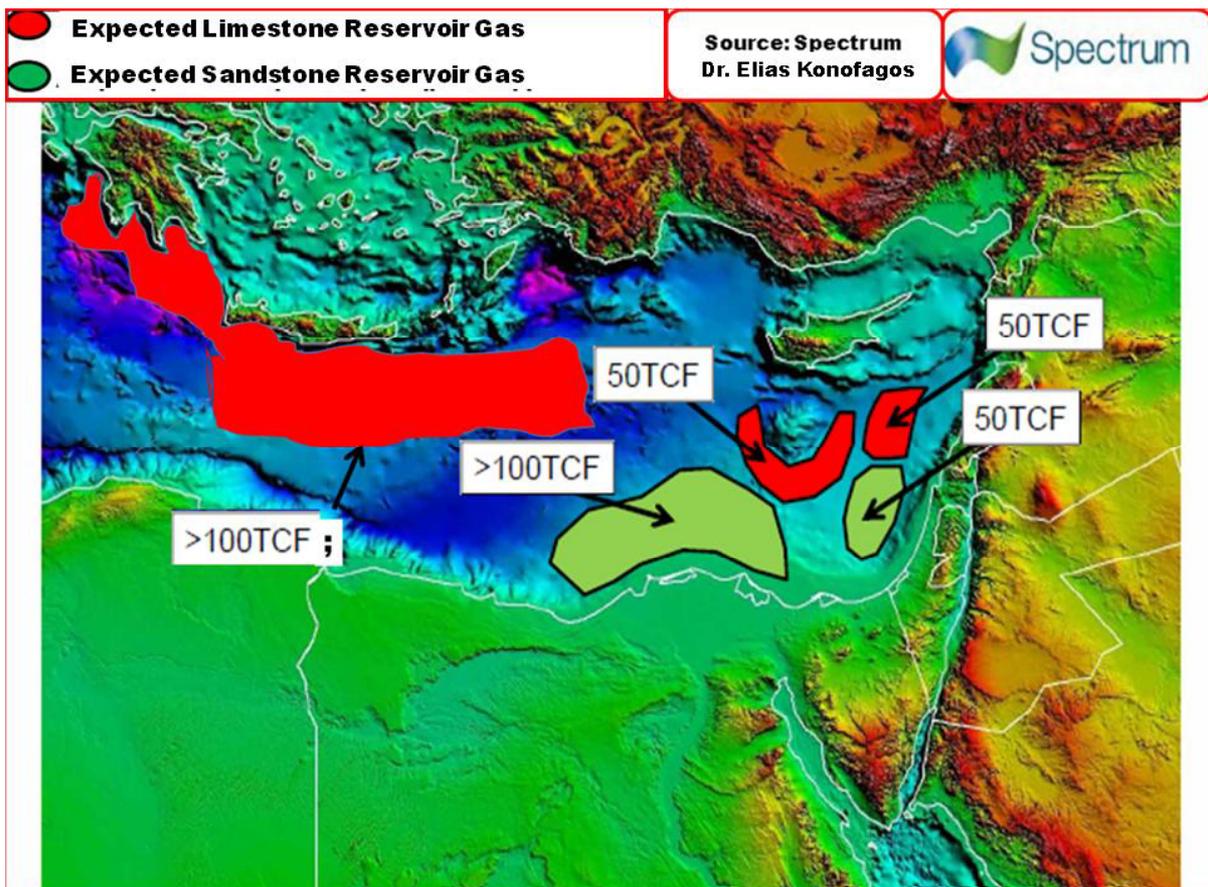


FIGURE 9. Expected Limestone and Sandstone Reservoir Gas

This new map show us that in the case of new giant or supergiant gas discoveries in Cyprus the economic growth for the country could reach much higher levels. According to Spectrum, with 50% probability, in the south Cyprus area we could expect biogenic gas limestone reservoirs gas resources of about 50 Tcf. The same amount is expected also to be explored in the western costs of Lebanon (Fig. 9). According to our evaluations, despite the existing geological complexity of south Crete offshore areas, this huge area could contain, with 50% probability, resources exceeding 100 Tcf.

Based on the above perspectives the 3rd Cyprus Licensing Round received a certain number of very interesting offers from energy giant oil companies:

- EXXON - MOBIL - QATARPETROLEUM, ENI - TOTAL, STATOIL, CAIRN -DELEK - AVNER for the Block 10.
- TOTAL - ENI for the Block 6.
- ENI, CAPRICORN OIL - DELEK - AVNER for the Block 8.

CONCLUSIONS

East Mediterranean is well located for resources development, with its proximity to Europe and the Suez Canal (a route to export its natural gas to Asia). In addition, it provides a diversification option for European gas supply (as it allows bypassing the existing and potential pipeline routes from/via Russia and Turkey). At the same time, the region suffers from substantial geopolitical tensions which may lead even to territorial disputes. In this unstable environment Cyprus has signed EEZ delimitation agreements with Egypt, Israel and Lebanon, but not with Turkey or Syria. Moreover, Israel and Lebanon have a disputed maritime border which could affect Cyprus should they wish to pursue tripartite collaboration.

Unfortunately, the countries in the region, trapped in old antagonistic behavioral patterns, haven't yet developed a comprehensive and successful energy policy that takes into account the above mentioned challenges along with the region's geopolitical changes. In the absence of the export option within an effective policy scheme, not only they will be hard-pressed to attract companies for upstream business, but the development of their resources may be seriously delayed.

This brings us to the future export potential of the countries in the region. The future of whole East Mediterranean region depends on the expected evolution in the international market. Taking into account that oil and gas offshore exploration and production campaigns last for decades and despite the current unstable geopolitical situation in the East Mediterranean and the presently low gas prices in the International market, it is about time for Cyprus, Egypt, Greece, Israel, Lebanon and Turkey to resolve their security disputes and by coordinating their actions attempt, without further delay, to attract appropriate serious investors in a new strategic spirit. This spirit has to facilitate development synergies by improving production infrastructures in the region and adopt much more flexible contractual terms and conditions for the IOC's. The forthcoming medium term presence of several centers of production facilities in the region will minimize deep and ultra deep regional natural gas production costs. Production infrastructure operations must be protected by efficient security measures insuring them from any kind of piracy, terrorist or military attack. Through new contractual terms and conditions between the oil companies and the host countries, the East Mediterranean natural gas resources could find the way to reach easier the European market either in the form of CNG, LNG or through appropriate pipelines network.

According to BP (2013), the global proved reserves of natural gas (those that can be recovered with reasonable certainty in the future from known reservoirs under existing economic and operating conditions) are 6,600 Tcf, including Russia's reserves of 1,160 Tcf, Qatar's reserves of 880 Tcf, and Turkmenistan's reserves of 620 Tcf. In addition, there is a substantial potential for shale gas with a recent estimate of 7,200 Tcf of technically recoverable resources

(EIA, 2013). To put these numbers into context, global gas use in 2012 was 117 Tcf (BP, 2013). There are plenty of alternative gas suppliers to satisfy a projected increase in global natural gas demand. Due to its location and geopolitical considerations, Eastern Mediterranean gas has a great potential but most likely it will not be a major player in global gas markets as this has happened in the Qatar case.

Apart these considerations, according to recent FLOW Energy studies, Greece remains the most unexplored country in the East Mediterranean region, more particularly in its deep and ultra deep offshore areas. Based on the ratio of the already discovered reserves versus to the resources yet to be found, Greece remains the third most unexplored country in the world after Morocco and South Africa. In accordance to International Law Greece claims an offshore EEZ of about 500.000 km². For comparison Qatar state owns an exclusive economic zone of about only 32.000 km². In 2013 a first 220.000 km² non exclusive seismic campaign was executed by the Norwegian company PGS into the western's Greek EEZ which included Ionian and Libyan sea areas. PGS recorded more than 12.000 km of seismic lines, for identifying possible oil and gas fields, in sea water depths varying between 500 m to 3.500 m. Recent initial seismic fast track interpretations followed by offshore geostatistics related to the Greek continental shelf indicated that the biggest expected oil and gas possible reserves targets are mostly located in deep and ultra deep Greek sea waters. Cypriot and Israeli gas field discoveries were also located in ultra deep water depths exceeding 1.500 m and in drilling depths of about 5.500 m under the seabed. We must also notice that East Mediterranean drilling costs were found being between \$70 million to \$120 million per well. It is estimated that completion of exploration efforts into offshore sedimentary geological basins of the Ionian and south Crete areas - in totally unexplored frontier zones - will require investments that could reach a minimum amount of 27 billion € into the next 40 years. The determination of attractive exploration licensing blocks into the existing geological basins of this wide offshore area of 220.000 km², according to our estimation, a first group of 20 blocks can be created, taking in account the local geological risk.

The next step for attracting E&P investments into the Greek offshore areas is the announcement of a Licensing Round where companies are required to submit bids for each of the blocks based to the terms of the tender compatible to the Greek Law and the EU directives and international petroleum contract standards. Following Offers Evaluation, Successful Bidders are invited to negotiate Exploration and Production contracts. Usually negotiations can last from 6 months to 1 year period, for an exploration period of 8 years and production period of 25 to 35 years. According to the Greek petroleum law based on European Union directive, concessions can also be granted through bid procedures out of Rounds, in case that company/ies make an application for acquiring a specific exploration area. In case of discovery the Greek petroleum tax provides for a tax of 25% constant for 25 years. This can be considered as a very attractive case. In the past (1995 - 1999) only two offshore seismic survey activities have been carried out in country, one in the Ionian sea and one in northern Greece. It should be emphasized that at that period there existed a dedicated state company (DEP-EKY subsidiary of the Public Petroleum Corporation of Greece) exclusively responsible for all upstream activities in Greece and abroad. Both the natural environments of the Survey Area as well as the "Greek bureaucratic environment" are indeed very challenging - and sometimes the latter is much more challenging than the former. For the specific activities, things are further complicated by the fact that currently Greece does not have a dedicated entity (like DEP-EKY) with experienced personnel on issues relating to hydrocarbon exploration. Experience has shown that foreign investors need expert local advice and services to assist them in the efficient execution of their projects and in the "navigation" through the confusing maze of the Greek bureaucracy thus avoiding major delays.

Concerning future oil and gas discoveries in Greece, the region's resources may significantly change the energy picture in the wider East Mediterranean region if they will be developed in a timely and successful way. Of course developing these resources will require overcoming numerous major obstacles with geopolitical implications. Today Cyprus, Egypt, Greece and Israel

with all other surrounding Middle East countries can be considered as a potential long term gas security axis supplying European countries. Based on forthcoming further production oil and gas infrastructure in Cyprus Egypt and Israel, Greece must attract similar investors in order to soon create his own infrastructure in this joint effort. Under the current adverse conditions, Greece can reestablish its economic position by exploiting its hydrocarbons potential, integrating the whole South East Mediterranean energy reserves, improving the long term energy security of the E.U. and making the rest of the reserves of Cyprus, Egypt, Israel, Lebanon, Syria and Turkey more economically attractive in the long run. By unified reserves and natural gas network, the region should and can consider all the natural gas and hydrocarbons export possibilities (Pipeline or maritime LNG or CNG transport etc) in a competitive framework. Joint energy synergies in the whole East Mediterranean region will certainly contribute to a peaceful better future for the region. If handled in the right way, energy policy can initiate important geopolitical partnerships, which can serve not only to mitigate conflict but to actually provide a solid basis for long-term cooperation and economic development in the region. We strongly believe that if all countries want to prosper, energy ambitions should be seen as an opportunity of cooperation and not confrontation.

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