

**HOW DO THE RECENT DISCOVERIES OF OFFSHORE ISRAELI AND
CYPRIOT GAS AFFECT THE REGION'S GEOPOLITICS?**

by

ECE DEMİR

**Submitted to the Graduate School of Arts and Social Sciences
in partial fulfillment of
the requirements for the degree of
Master of Arts**

**Sabanci University
January 2014**

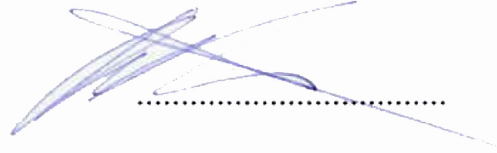
HOW DO THE RECENT DISCOVERIES OF OFFSHORE ISRAELI AND CYPRIOT
GAS AFFECT THE REGION'S GEOPOLITICS?

APPROVED BY:

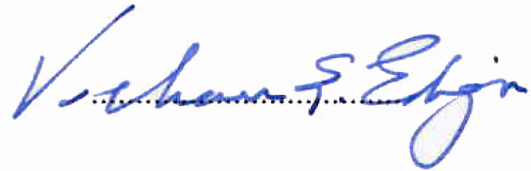
Ahmet O. Evin:
(Thesis Supervisor)



Meltem Müftüler-Baç:



Volkan Ediger:



DATE OF APPROVAL: 13.01.2014

© Ece DEMİR 2014

All rights reserved

To Zafer,

Hope he is still watching over me from heaven as he always did

ABSTRACT

HOW DO THE RECENT DISCOVERIES OF OFFSHORE ISRAELI AND CYPRIOT GAS AFFECT THE REGION'S GEOPOLITICS?

ECE DEMİR

M.A. in European Studies Program, Thesis, 2014

Supervisor: Ahmet O. Evin

Key Words: Natural gas power plant, Petrol Pipelines, Natural gas pipelines.

The effect of the recent discoveries of offshore Israeli and Cypriot gas on the region's geopolitics is the main focus of this study. The questions regarding the topic are answered in two chapters. In the first chapter, possible economic and political effects of offshore explorations in the Eastern Mediterranean are analyzed. The economic, financial and export potential of the resources is investigated in terms of the countries that claim the resources, particularly those of Egypt, Israel and Cyprus in the content of thesis political and historical relations with their neighbors. In the second chapter, possible investment and export options that may bring a solution to the challenges are proposed in terms of scenarios, and every scenario is analyzed in terms of its political, economic and regional effect. The six scenarios that are analyzed in this thesis follows: Arish-Ashkelon Pipeline, Israel's possibility of using the gas for regional peace, Pipeline to Turkey, Floating LNG Facility, East-Med Pipeline Project and Vassilikos LNG Terminal. These scenarios are presented hierarchically in terms of their relative effectiveness.

ÖZET

SON DÖNEMDE İSRAİL VE KIBRIS AÇIKLARINDA YAPILAN GAZ KEŞİFLERİ BÖLGENİN JEOPOLİTİĞİNİ NASIL ETKİLİYOR?

ECE DEMİR

Avrupa Çalışmaları Yüksek Lisans Programı, Tez, 2014

Danışman: Ahmet O. Evin

Anahtar kelimeler: Doğal gaz enerji santrali, Petrol boru hatları, Doğal gaz boru hatları.

Son dönemde İsrail ve Kıbrıs açıklarında yapılan gaz keşiflerinin Doğu Akdeniz jeopolitiğine etkisi bu çalışmanın ana konusudur. Konuyla ilgili sorular iki bölümde yanıtlanmaya çalışılmıştır. İlk bölümde Doğu Akdeniz kıyılarında geçmişte yapılmış ve hali hazırda yapılmakta olan açık deniz doğal gaz araştırmaları ve bu araştırmalardan çıkacak ekonomik ve siyasal sonuçlar ele alınmıştır. Kaynakların finansman, kullanım ve potansiyel ekonomik değeri bu kaynakları sahiplenen ülkeler bazında incelenmiş, özellikle İsrail, Mısır ve Kıbrıs'ın komşuları ve bölgedeki diğer ülkelerle tarihsel ve politik ilişkileri göz önünde tutularak irdelenmiştir. İkinci kısımda ise, bu soruna çözüm getirebileceği düşünülen olası yatırım ve ihracat senaryoları ele alınıp incelenmiş, her bir senaryonun ekonomik politik ve uluslararası ilişkiler bağlamında sebep olabileceği etkiler analiz edilmiştir. İrdelenen senaryolar Arish-Ashkelon Boru Hattı, İsrail'in gazı bölgesel barış için kullanması, Türkiye'den geçirilecek bir boru hattı projesi, Sıvılaştırılmış Doğal Gaz (LNG) İşleme Gemisi, Doğu Akdeniz Boru Hattı Projesi ve Vassilikos Doğal Gaz Terminali olmak üzere altı tanedir. Tez, bu senaryoları etkinlik derecesine göre sınıflandırmaktadır.

Acknowledgements

I would like to express my gratitude to my thesis supervisor, Ahmet Evin. I also want to thank Meltem Müftüler-Baç for supporting me, even when I looked hopeless and unpromising. Her patient guidance and belief in me made me feel safe, motivated me on moving to keep and work hard on what I had started.

I warmly thank my precious friends/colleagues Özgül Kızıldağ and Meryem Kösehanogulları for their moral support and patience during my thesis writing period.

I would also like to thank my dear friend, sister, Elif Özdemir, for being an enormous support for me during this process, forcing me to complete the work and do my best, she made my academic journey meaningful with all her love and care. I am so lucky to have her. I would like to thank my friend Saadet Şen, my unofficial nurse for healing me in the most stressful days with all her home made medicine and herbs. Also I thank Simone Tagliepietra, an incredible person and a friend that I gained during my study on energy, who always had patience for my endless questions. My lovely friends Veysel Sönmez, Sena (Seyhan) Dicle Günay, Ayşe Nazlı Söylet, which all had patience for my all crazy stuff during this whole process and made everything sweeter, funnier, and more enjoyable.

I am thankful to all my friends who, even though I was missing for months, none of them stopped calling me, or supporting me. I am glad to have you guys.

Above all, I am very grateful for my Mother; without her endless support and love, I would never be who I am. She is my biggest luck and treasure.

Lastly, my dear significant other, Said Doğan, who has always been with me, with all his care and love, he became my mind in the times when my mind had stopped. I am glad to have him.

TABLE OF CONTENTS

Abstract	v
Introduction	1
i. Existing Studies On The Subject.....	4
1 Chapter One: Offshore Explorations In East-Mediterranean	13
1.1 Historical Analysis.....	13
1.2 Exploration Offshore Egypt.....	15
1.3 Exploration Offshore Israel.....	16
1.4 Exploration Offshore Cyprus.....	18
2 Chapter Two: East-Mediterranean Natural Gas Scenarios	20
2.1 Scenario I: Arish-Ashkelon.....	20
2.2 Scenario II:Peace.....	24
2.2.1 Palestine.....	25
2.2.2 Lebanon.....	26
2.2.3 Egypt.....	27
2.3 Scenario III: Turkey.....	27
2.4 Scenario IV:Floating LNG Facility.....	30
2.5 Scenario V: Eastern-Mediterranean Pipeline Project.....	33
2.6 Scenario VI:Vassilikos LNG Terminal.....	36
Conclusion	40
Bibliography	42

LIST OF MAPS AND FIGURES

Maps

Map 1.1: Israel's Offshore Fields.....	17
Map 1.2: Offshore Cyprus Hydrocarbons Exploration Blocks.....	19
Map 2.1: Arish-Ashkelon, Arab Gas Pipeline (AGP).....	22
Map 2.2: The Republic of Cyprus EEZ delimitations and hydrocarbon research blocks and Turkey's continental shelf claims.....	25
Map 2.3: Overlap of maritime border claims by Israel and Lebanon	26
Map 2.4: Routes of TAP and TANAP pipelines.....	29
Map 2.5: Eastern-Mediterranean Pipeline Project.....	34

Figures

Figure 1.1: Projected LNG demand by region through 2020.....	38
--	----

INTRODUCTION

Pursuit for energy resources is one the most important interests a country would have since the industrial revolution. Since the 19th century, countries waged war with one another just to acquire a coal mining city in order to secure their coal supplies for the factories at home. It would be a mistake to make the assumption of all the major wars after the industrial revolution were caused by pursuit of securing energy resources. Countries, however, still needed to have a secure line of energy supply in order to have a stable economy even if the main causes of wars were not energy itself. This makes the pursuit of energy resources a highly important subject on which to focus in order to understand the economic development of a country, as well as its relationship with other countries.

After World War II, in order make war impossible, six European countries signed the Treaty of Paris in 1951 which established the European Coal and Steel Community. French Foreign Minister Robert Schuman proposed the idea of a supranational body to prevent a possible future war between Germany and France. Aim was to create a common market which would make waging a war too costly for economies of the countries. Thus, countries had to be in good terms with one another for their material interests. This example is a proof that, by using energy resources, countries can establish international bodies to stop themselves from waging war with one another, have peaceful relationships and cooperation with each other and thereby not only achieve economic stability at home, but also economic development and growth.

Eastern Mediterranean natural gas findings in the past ten years make the region an interesting area for research to understand the effects of these natural gas reserves on the geopolitics of the region and beyond. Israel holds the most gas reserves in the region with Tamar and Leviathan gas fields. Cyprus discovered significant offshore natural gas reserves. After the discovery of these large gas reserves in the Eastern Mediterranean, several challenges arose because of the complex politics and geopolitics of the region. Because of the unstable geopolitical landscape, countries with natural gas reserves continue to argue about how to monetize their resources and maximize their return from

this reserves. Natural gas discoveries surely would bring potential benefits and risks not only to countries which have the resources, but also to countries without resources which would have an interest to buy natural gas from those who have.

Potential benefits of their natural gas resources are countless for Israel, Cyprus, the Palestinian Authority and Lebanon. One of the most important benefits is the decreasing reliance on energy imports from uncertain suppliers, as well as stabilization of electricity supplies at more competitive prices. There exists a chance for the improved trade balance and gross domestic product (GDP) for the aforementioned countries, as well as sounder public finances through increased tax revenues that would lead to the possibility of increased investment in upstream and downstream industries, leaning to economic diversification. Based on natural gas, a cleaner energy mix could be achieved as well as more abundant water supplies from desalinization plants fuelled by natural gas and potentially less conflict in the region over water.¹

Benefits also do exist for the European Union in various areas. By putting its support behind Cypriot natural gas developments, the EU can ensure the economic stability of Cyprus, thus the stability of the Euro zone. Cyprus is one of the five countries that had to get a bailout from European Union after the Euro crisis. Strengthening of the economy of the EU member state Cyprus is of interest to the EU; thus, support for Cypriot natural gas is a potential way to accelerate economic development of Cyprus. Cypriot natural gas can also increase the EU's overall energy security by means of Cyprus gas exports to EU member states. One of the main goals of the EU for energy security is to reduce reliance on Russian natural gas supply and diversification of gas sources. This can be attained by supporting other natural gas development efforts in the Eastern Mediterranean, such as the Israeli gas fields, Leviathan and Tamar. The European Union's involvement in energy developments in the Eastern Mediterranean would increase the EU's foreign policy capabilities since involvement in the region would make the EU an important actor in the region rather than being merely an observer.

¹ Michael Leigh, "Preliminary Reports and Recommendations on Energy Resources in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension", German Marshall Fund, 2012
http://www.gmfus.org/wp-content/blogs.dir/1/files/mf/1339170753Leigh_SummaryDocument_Jun12_maps.pdf

The discovery of natural gas in the Eastern Mediterranean also holds potential benefits for Turkey. Natural gas reserves in the region can serve as a source of natural gas diversification for Turkey, a country that seeks to reduce its natural gas dependency on Russia. By accessing revenues earned from energy production, Turkish Cypriots would see a reduction in their economic dependency on Turkey. This would mean that Turkey can correspondingly reduce its direct economic assistance to the Turkish Cypriots and focus on other areas of cooperation, while the Turkish Cypriots would be able to cover substantial amount of their budgetary needs by their earnings from energy resources. If political circumstances allow the transport of gas from the Eastern Mediterranean to Europe through Turkey, interest in the Southern Corridor and offshore explorations in Turkey potentially can increase.

As the region is a highly troubled one, there are numerous political risks that may arise from these developments. First option that comes to mind is the possible delimitation disputes that may arise between Israel and Lebanon and between Cyprus and Turkey. Such disputes are likely to be aggrandized by the existing conflicts in the region such as the division of Cyprus, Israel's state of war with Lebanon, the Israeli – Palestinian conflict and tensions between Israel and Turkey following the Gaza flotilla incident. Ongoing regional turmoil and the uncertainties concerning the political regimes in Lebanon, Syria and Egypt also points to potential security risks.

The effect of the recent discoveries of offshore Israeli and Cypriot natural gas reserves on Eastern Mediterranean geopolitics is the main focus of this study. This work undertakes to investigate the following questions in two chapters:

Chapter One, "Offshore Explorations In East Mediterranean", aims to explore past and current developments in the Eastern Mediterranean region by focusing on three countries, namely Egypt, Israel and Cyprus. This chapter will explore the relationship of each of these three countries with its neighbors as well as its role in the region. It will then examine their natural gas resources and potential role as energy producers, in particular, as suppliers and consumers of natural gas.

Chapter Two, "East-Mediterranean Natural Gas Scenarios", intends to investigate the possible scenarios that Israel and Cyprus can choose from to develop their natural gas reserves. This chapter will present six scenarios. The first scenario,

Arish-Ashkelon, suggests Israel exporting its natural gas to Egypt through the existing Arish-Ashkelon pipeline. The second scenario, Peace, explores possible peace-building measures that Israel can choose to extend to Egypt, Lebanon and Palestine. The third scenario, Turkey, examines the possibility of Israeli natural gas export by building pipelines through the Turkish territory. The fourth scenario, Floating LNG Facility, gives a brief explanation of how FLNG facilities work and its possible application in Eastern Mediterranean. The fifth scenario, Eastern Mediterranean Pipeline Project, deals with building a pipeline from Israel to European Union through Cypriot and Greek territories. The sixth and last scenario, Vassilikos LNG Terminal, involves building an LNG terminal in Cyprus for Cypriot natural gas and possible supply of Israeli natural gas through Cyprus.

There have been a broad range of studies published on eastern Mediterranean natural gas ever since the discovery respectively of offshore resources by Israel and Cyprus. In addition to technical and economic aspects, these studies have considered the geopolitical, security and legal aspects of prospecting, extracting and transporting these newly found resources. The following subsection examines in detail the existing literature and academic studies on this topic.

i. Existing Studies On The Subject

Making comparative analyses of the potential benefits and distribution possibilities of the Eastern Mediterranean Hydrocarbons, especially the Israeli and Cypriot resources, is a new concept, at least not as old the rest of the energy politics literature. Although reliable analyses and reports do exist, the literature is still limited due to the fact that research on Eastern Mediterranean natural gas reserves is relatively new. Despite the lack of extensive academic work done on the newly discovered East-Med Hydrocarbons, research on the topic has been reinforced by the credibility of data provided by companies engaged in drilling, official sources and international agencies, such as the U.S. geological survey. The available data moreover, have been disseminated by the news media. As a result, there appeared in the brief period of time several significant studies that are taken into consideration in this subsection.

Written by Simone Tagliapietra from Fondazione Eni Enrico Mattei, *Towards a New Eastern Mediterranean Energy Corridor? Natural Gas Developments between Market Opportunities and Geopolitical Risks* is one of the few important papers that can

be used for a research on the Eastern Mediterranean Hydrocarbons. The author provides a comprehensive overview on the regional developments and proposes some critical discussion of the market opportunities and geopolitical risks related to the potential emergence of the new Eastern Mediterranean Energy Corridor.²

Starting with the series of events that keep reshuffling the political equilibrium of the region, such as the Arab Spring, the civil war in Syria, Turkey's claims being a regional leader, the tensions between Israel and Gaza, and the never-ending dispute between Turkey and Republic of Cyprus, Tagliapietra continues by explaining the developments that reshuffle another equilibrium in the region: energy. Tagliapietra claims that natural gas findings in the offshore Egypt, Israel and Cyprus are reshaping the regional energy map and rapidly making the Eastern Mediterranean a world-class gas province. The work addresses the Arab Gas Network as the most ambitious project of the natural gas cooperation ever attempted in the region, which is one of the most important statements of the paper.

Michael Leigh and Charlotte Brandsma's joint paper, published under the Brussels Forum, *Energy Resources in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension*³ is also an important source on addressing the geopolitical dilemmas and security concerns that may arise from the discoveries. The paper also makes references to the relations of the parties concerned and challenges in terms of infrastructure, financing, security, environmental protection, revenue sharing and political relations. The fact that the EU and the United States have an interest in preventing hostilities and in ensuring that new energy resources are developed for the benefit of the region as a whole is one of the far reaching arguments of the paper.

Tullio Scovazzi's GMF report on the *Maritime Boundaries in the Eastern Mediterranean Sea*⁴ is a significant source for gaining an understanding on the nature

² Simone Tagliapietra, "Towards A New Eastern Mediterranean Energy Corridor? Natural Gas Developments Between Market Opportunities And Geopolitical Risks", Fondazione Eni Enrico Mattei, 2013.

<http://www.feem.it/userfiles/attach/2013215105594NDL2013-012.pdf>

³ Michael Leigh, Charlotte Brandsma, "Energy Resources In The Eastern Mediterranean: Source For Cooperation Or Fuel For Tension", Brussels Forum, 2012.

http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/leigh_brandsma_easternmedenergy_bf12.pdf

⁴Tullio Scovazzi, "Maritime Boundaries In The Eastern Mediterranean Sea", German Marshall Fund Of The United States, 2012.

http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339504227Scovazzi_MaritimeBoundaries_Jun12.pdf

and extent of maritime zones, debated concepts as contiguous zone, exclusive economic zone, continental shelf, and high seas. United Nations Convention on the Law of the Sea is also examined in a historical dimension, taking into account the clashing interests and the significant roles of the parties that intervened (or did not intervene like Turkey) in the process. It makes references to maritime delimitation treaties concluded by Eastern Mediterranean states in trying to answer the open questions of the particular maritime delimitation in the East-Med Sea.

There are also country-based reports on East-Med Hydrocarbons, like Toulou Onoufriou's GMF report, *Cyprus – a Future Energy Hub?*⁵ The author examines the case from a Cypriot point of view, analyzing the case as an opportunity for the island to pay its debt and recover its economy from its economic crisis. Although Onoufriou's report has some weak arguments, such as her claim that there is nothing in the region that may discourage potential investors, it does give some hints about an academic view on the possible scenarios regarding revenue sharing.

Another country-based report from GMF is the *Rivalry in the Eastern Mediterranean: the Turkish Dimension* by Mehmet Ögütçü⁶. Ögütçü starts by explaining the political context and Turkey's Energy Policy, followed by Turkey's response to gas discoveries by Cyprus and Israel, and continues with questioning a possible new alignment in the Mediterranean. The author suggests that, in the absence of mutually agreed maritime boundaries, the possibility of joint development of offshore energy resources, or at least a more coordinated approach should be considered without prejudice to respective positions on long-standing political problems. There is also an emphasis on the fact that Turkey and its neighbors need to avoid harsh rhetoric and brinkmanship; instead, pending solutions of bilateral differences, they should consider interim agreements to reduce risk and allow exploration and production to go ahead in a more predictable environment.

Another country-based report of the GMF is the *Energy Discoveries in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension? The Case of*

⁵Toulou Onoufriou, "Cyprus – a Future Energy Hub?", German Marshall Fund Of The United States, 2012. http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1349894204Onoufriou_CyprusEnergy_Oct12.pdf

⁶Mehmet Ögütçü, "Rivalry In The Eastern Mediterranean: The Turkish Dimension", German Marshall Fund Of The United States, 2012. http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339171647Ogutcu_EasternMedRivalry_Jun12.pdf

Israel by Simon Henderson.⁷ This policy brief starts with Henderson giving a general account of the energy overview of the current development stage in Israel. Henderson argues that Tamar field would be enough to satisfy current domestic consumption when it comes on-stream and Leviathan field would make Israel a significant energy exporter when the production begins in 2017. Henderson lists several options on how to export natural gas which are; LNG, pipeline or export of electricity produced by natural gas via submerged cables. He illustrates positive aspects of these options as well as negative aspects. Henderson also explains political and security challenges of the listed options.

Another GMF Policy Brief, by Michael Koehler is *Gas Discoveries in the Eastern Mediterranean: Implications for the European Union*⁸. Koehler says that global demand for natural gas supplies is increasing and Europe will require substantial growth in both oil and gas imports in the next 10 to 20 years. Koehler then continues to list the reasons why the EU needs to be involved in the Eastern Mediterranean gas issues: reasons; they are mainly the energy security of Cyprus, Israel, and Palestinian authority but also EU's own energy security. These energy resources need to be developed as part of a balanced, overall energy strategy. According to Koehler, European Union has an interest in the stability of this region; Turkey also shares the EU's interest in regional stability. Due to the turmoil in Syria and political uncertainties, security of energy installations is important for all Mediterranean countries.

A policy paper from BST, a GMF project, written by Dorothee Schmid is titled as *Towards an Energy Revolution in the Eastern Mediterranean: Any Positive Effect for the EU?*⁹ Schmid argues that due to recent giant gas discoveries in the Levant, the EU should change its approach from long periods of planning and rhetorical deliberation to a more practical and active format. According to Schmid there is no doubt that the Levant-originated gas would have an impact on the EU's future economic outlook but it is hard to forecast, according to him, the magnitude of such an impact because different

⁷ Simon Henderson, "Natural Gas Exports For Israel and Cyprus", German Marshall Fund, 2013. <http://www.washingtoninstitute.org/uploads/Documents/opeds/Henderson20130901-NaturalGasExportOptions.pdf>

⁸ Michael Koehler, "Gas Discoveries in the Eastern Mediterranean: Implications for the European Union", German Marshall Fund, 2012. http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1351282654Koehler_GasDiscoveriesEU_Oct12.pdf

⁹ Dorothee Schmid, "Towards an Energy Revolution in the Eastern Mediterranean: Any Positive Effect for the EU?", Center For International and European Studies, 2013. [http://www.khas.edu.tr/cms/cies/dosyalar/files/NeighbourhoodPolicyPaper\(12\).pdf](http://www.khas.edu.tr/cms/cies/dosyalar/files/NeighbourhoodPolicyPaper(12).pdf)

scenarios regarding on Levant gas resources can yield different geopolitical results. Schmid argues that states would get into a power struggle to control these new resources. She also gives some early recommendations to the EU about how not to lose its political influence in the region by actions it can take.

The last GMF report used in this article is by Jeffrey Mankoff, *Resource Rivalry in the Eastern Mediterranean: The View from Washington*¹⁰. The author states that the United States welcomed the discovery of gas reserves in the Eastern Mediterranean over the past decade as these resources can bolster the energy security of Israel, Cyprus and Europe as a whole and reduce, to some degree, the European Union's dependence on exports from Russia. The US also supports Turkey's future involvement in the East-Med natural gas when and if political circumstances permit. The article also keeps emphasizing the fact that United States is seeking to avoid escalation of tensions in the region.

Michael Leigh's Preliminary Reports and Recommendations on *Energy Resources in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension*¹¹ is like a bibliography for the ideas stated in GMF policy briefs, and Mediterranean Policy papers. Leigh gives an introduction of five reports written on the opportunities and risks of Eastern Mediterranean gas discoveries. This paper includes list of recommendations and benefits towards the regional countries as well as for European Union and United States.

The Prio Report on *Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios*¹², written by Ayla Gürel, Fiona Mullen and Harry Tzimitras represents one of the most detailed researches on the area. The study focuses on the case of Cyprus, by examining the relevant developments from the legal, political and economic perspective. The report starts with a summary of the recent natural gas discoveries in the region and continues by assessing the significance of finds offshore Cyprus. As they

¹⁰ Jeffrey Mankoff, "Resource Rivalry in the Eastern Mediterranean: The View from Washington", German Marshall Fund, 2012.

http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339093526Mankoff_ResourceRivalry_Jun12.pdf

¹¹ Michael Leigh, "Preliminary Reports and Recommendations on Energy Resources in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension", German Marshall Fund, 2012

http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339170753Leigh_SummaryDocument_Jun12_maps.pdf

¹² Ayla Gürel, Fiona Mullen and Harry Tzimitras, "Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios", Prio Report, 2013.

http://www.prio.no/Global/upload/Cyprus/Publications/Hydrocarbons_Report-ENG.pdf

examine the legal framework of maritime delineation in the region, they focus, in particular, on the UN Convention on the Law of the Sea (UNCLOS or the Convention) as well as the reasons why the neighboring Turkey objects to certain UNCLOS articles, and therefore why it has not signed the Convention. There is also a detailed analysis on the maritime jurisdiction disputes in the region which relate to Cyprus, including the dispute between Greece and Turkey in the Aegean Sea and the maritime border dispute between Israel and Lebanon. The authors made connections between the historical positions on the Cyprus problems and dispute about sovereignty, and positions on hydrocarbons exploration of various parties involved in the dispute.

Clarifying Turkey's approach to explorations in the southern and northern parts of Cyprus to these developments, and the response of the international community, authors explain that, while it is clear that the international community supports the right of the (de facto Greek Cypriot) Republic of Cyprus (RoC) to explore oil and gas, it also has strong expectations that the hydrocarbons revenues will be shared with the Turkish Cypriot Community in the event of a solution to the Cyprus problem. The steps taken by the Turkish Cypriots and Turkey in response to the Greek Cypriot gas exploration is taken into account. In particular, the "policy of reciprocity", whereby the exploration by Greek Cypriots is met with exploration by Turkish Cypriots (with Turkey's collaboration) in areas to which the Turkish Cypriots feel they have an equal claim is explained. Potential attempts by Turkey to explore natural gas in areas claimed by Turkey as part of its continental shelf, some of which overlaps with the exclusive economic zone proclaimed by the RoC are also discussed.

The second part in which the export options open to the RoC are examined was used as a roadmap in the writing of this paper. Authors agreed that RoC must wait longer before construction of an LNG plant can begin, because financing a small liquefied natural gas (LNG) plant would be difficult if there will not be any additional volumes coming from further explorations in the second licensing round or from Israeli resources. Another option, which will bring revenue, sooner than an LNG plant, would be a pipeline to Turkey, which is not possible unless there is an agreement on the Cyprus problem. Outlining the positions of the parties, the authors seek to find the Cyprus problem solution scenarios and possible export options for each scenario. Simulating varieties of options from best to worst, authors argue that a scenario similar to the status quo—official negotiations to solve the Cyprus problem on-going but no

real progress in practice—is the most likely. The extent to which this scenario affects whether or how fast the RoC can earn hydrocarbons revenue will depend to a large degree on factors that are out of its hands, namely on whether Israel would export its natural gas with Cypriot cooperation or not, which is an important variable. Under a status quo scenario, gas revenue flowing to Greek Cypriots would be most vulnerable if Israel and Turkey were to make friends and Israel took up Turkey’s recent offer to pipe gas from Israel to Turkey.

Oxford Energy Journal, a quarterly journal for debating energy issues and policies, was also a fruitful source for making a research on East-Med Hydrocarbons. Issue 93 was dedicated to East Mediterranean Gas, and exploring the complex of web geopolitics and energy policy that provides the backdrop to the new gas province emerging in the East Mediterranean. The issue starts with Trevor Sikorski’s detailed overview of the changing face of the global LNG market with the East-Med gas’ entry to the game. Sikorski argues that when the projects come into practice, the LNG market will be different from today, as Qatar will lose its pre-eminent position as Australia and the USA will be making major inroads. Author projects greater competition will arise among LNG sellers, higher transparency on pricing, leading Asian buyers to move away from oil-indexed pricing. He also argues that Russia’s response to these developments will be key to the state of European LNG market, where East Mediterranean cargoes are likely to end up. Laura El-Katiri frames the regional context for the East Mediterranean gas revolution and claims that the gas exports from the region will be the center of attention. El-Katiri argues that last few years saw substantial growth in domestic power demand and that new natural gas producers will have an economic advantage as they would easily supply less expensive natural gas to their domestic market which would reduce costly oil-fired power generation. The author looks beyond the political issues that have so far prevented substantial cross-border energy flows, to consider the potential benefits for the growing number of regional energy-deficit countries, geostrategic interests will ultimately condition these outcomes.¹³

Joseph Paritzky and Bill Farren-Price discuss the current and future impact of gas on Israel’s dependence on energy imports and obstacles that may occur on export process on LNG or pipeline, in the face of domestic political opposition or technical

¹³ Oxford Energy Forum, Issue 93, Ed. Bassam Fatouh
<http://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/10/OEF-93.pdf>

security challenges. They taking into account various scenarios that may be applied, while export process, such as cooperation with Cyprus or a pipeline to Turkey – if the requisite political changes do happen.

Leigh Elston and Peter Stewart argue that the Israeli government's decision to limit exports to the gas discoveries at 40 per cent of the proven resources is made as a policy decision with the aim to give an increase to gas development, while leaving enough gas for the expanding domestic market. They discuss the complications that arise from the Israeli political objections to the gas export decision and various monetization options for Israeli resource holders.

According to Matthew J. Bryza, the Israel-Turkey gas pipeline is the most commercially efficient export option for the Israeli gas, and an influence and a possible guarantee on regional stability, which will be possible in an environment on smoother diplomatic relations between two countries and in further political work between Cyprus and Turkey.

Ayla Gürel examines the difficulties that arise from the Cyprus problem for regional energy integration. While options for a pipeline carrying gas from Cyprus and potentially from Israel and other producers in region, to Turkey and onwards to other South-Eastern European buyers discussed, an exploration on the positions of Turkey, Cyprus and the international community to offshore gas development as well as the issue of resource sovereignty made.

Charles Ellinas provides a Cypriot perspective and outlines the country's gas export strategy, make projections on future demand for Cypriot gas in Europe and explains Nicosia's decision on adopting LNG as its primary gas export option. Ellinas considers Cyprus as a liquefaction hub for Israeli and Lebanese gas, but he also states the economic and competitive risks looming in terms of shale gas and the uncertain global economic outlook.

Possibility of Cyprus' newly-found hydrocarbons playing an important role on the overcoming the banking and fiscal crisis can be taken into account, soon after appraisal drilling and fresh exploration are undertaken, and the reserves are understood better, says Anastasios Giamouridis.

Dimitris Manolis and Elsa Loverdos' article is on DEPA's proposed East-Med pipeline project, running from the offshore fields to Cyprus and onwards to Crete and Greece. They point out that the EU's strategy of diversifying its energy import sources can be reinforced with such a project, and the competition among the producers can be increased. Although there are some drawbacks of LNG, taking the LNG route would place Cyprus in competition with other lower-cost producers feeding the Asian market.

Gerald Butt points to the diversity of the Turkish energy policy: a strategy that now will favor oil and gas from northern Iraq over prospective supply from the East Mediterranean. Butt is skeptical about prospects for the resolution of Eastern Mediterranean political entanglements and instead argues that Ankara will persist with its political and capital investments in Iraqi Kurdistan.

Another guideline-formatted paper on this research was the *Natural Gas Export Options for Israel and Cyprus* by Simon Henderson.¹⁴ Stating the newly gained positions as energy exporters of Israel and Cyprus, by the recent discoveries, Henderson points that depth and distance of the resources from the both countries, and suggests solutions to diplomatic and technical challenges that may arise from the situation. Another obstacle that increases the challenges in decision-making process is the possibility of finding additional significant gas fields, and even exploitable oil deposits. While Henderson develops a range of export options, both by pipeline and liquefied natural gas (LNG) and even in electricity, he points the likelihood of cooperation between Cyprus and Israel, and Cyprus being an important element in each country's successful exploitation of the new-found riches.

¹⁴ Simon Henderson, "Natural Gas Exports For Israel and Cyprus", German Marshall Fund, 2013. <http://www.washingtoninstitute.org/uploads/Documents/opeds/Henderson20130901-NaturalGasExportOptions.pdf>

CHAPTER ONE

This chapter deals with the examination of the past and current developments in the Eastern Mediterranean region by focusing on Egypt, Israel and Cyprus. The reason for choosing these three countries is that all of them have significant proven natural gas reserves. Also, the three countries' relationship with other regional actors affects the geopolitical landscape of the region. Egypt's large population, its instable relationship with Israel and its being a natural gas producer were the main reasons for its selection. Recent natural gas discoveries in offshore Israel make examination of Israel an attractive and reasonable choice when doing research on Eastern Mediterranean. Since its creation in 1948, Israel struggled to have good relationships with other countries in the region. Effects of these natural gas reserves on geopolitics of the region is one of the reasons why Israel is examined in this chapter. Cypriot natural gas findings in its offshore are not much compared to the Israeli discoveries but Cyprus's divided status due to Turkish invasion of northern part of the island in 1974 and the fact that Cyprus is a European Union member with energy resources are the reasons why it got selected to be included in this chapter.

Firstly, this chapter will try to explain historical relationships of these countries with other countries in the region. Secondly, it will give an account of each of the selected countries' natural gas capabilities.

1.1 Historical Analysis

After the UN partition plan was announced in 1947 to find a solution to the Palestine question, the parties of the conflict did not accept the plan. As a result, a civil war broke out which caused a military intervention by several Arab states.¹⁵ Israeli military forces won the war and State of Israel was established within the borders of proposed partitioning plan. Egypt was able to retain the control of Gaza Strip and Jordan gained the control of Eastern Jerusalem.

¹⁵ "Resolution 181 (II). Future government of Palestine", United Nations, 29 November 1947. <http://domino.un.org/unispal.nsf/0/7f0af2bd897689b785256c330061d253>

In 1957 Egyptian president Gamal Abdel Nasser tried to nationalize Suez Canal to obtain higher revenues from the canal. Britain, France and Israel objected to Nasser's nationalization plan which prompted the invasion of Israel to Sinai Peninsula. Israel stayed in Sinai until the end of March 1957 and then withdrew its forces. Israel was able to defeat Egyptian forces without much hardship and it was able to gain the freedom of navigation in the Straits of Tiran at the end of the conflict. The defeat of the Egyptian forces in the conflict did not prevent Nasser from becoming a heroic figure in the eyes of Egyptian and Arab societies as a result of his standing up against British, French and Israeli forces.

In 1967, Israel suddenly attacked Egyptian and Syrian positions as Israeli intelligence suggested that Egyptian attack on Israel was imminent due to Egyptian military mobilization in Sinai Peninsula. Israel Defence Forces were able to overcome Egyptian, Syrian, Jordanian and Iraqi military forces just under six days. At the end of the Six-Day War, Israel gained control of the Sinai Peninsula, Gaza Strip and East Jerusalem.

In 1973, Egypt and Syria prepared and orchestrated a coordinated attack on Israeli positions in Sinai and the Golan Heights. At the beginning of the Yom Kippur War, Egypt and Syria were able to defeat Israeli forces quite easily as Israel was not expecting any attack. Israeli forces were able to pushback both Egyptian and Syrian forces to their pre-attack positions. The Yom Kippur War ended with Israeli military victory. However, early military successes of Egyptian and Syrian forces in the war damaged the image of invincibility of the Israeli military. In 1979, Egypt and Israel signed a peace treaty which paved the way the normalization of the Israeli-Egyptian relationship. Israeli withdrawal from the Sinai Peninsula after the signing of the peace treaty effectively gave the control of Sinai to Egypt. Also, Egyptian recognition of the state of Israel state prompted the Arab League to suspend Egypt's membership. After the 1979 peace treaty, Egypt started to supply crude oil to Israel, flights began between the two countries and increased.

Ottoman Empire had the sovereignty of Cyprus for over three centuries until it had to give control of the island to British Empire in 1878. The British annexed the island in 1914 and the Republic of Turkey recognized British sovereignty over the island in 1923. In 1955 intercommunal violence broke out between the two

communities on the island, Greek and Turkish Cypriots. Britain, Greece and Turkey became guarantor countries of the future state of Cyprus to ensure that Cyprus would not side with Turkey or Greece and to prevent the partition of the island. In 1960 Cyprus gained independence from Britain and joined the Commonwealth of Nations in 1961. Fearing plans to unite Cyprus with Greece, Turkey, using its guarantor status, intervened and invaded the northern part of the island in 1974. The Turkish military did not meet much resistance from Greek Cypriot forces and advanced until it controlled over 36% of the island. Turkish Cypriots, under the leadership of Rauf Denktaş, declared the establishment in 1981 of Turkish Republic of Northern Cyprus in the northern part of the island, which has been recognized by Turkey only.

Cyprus signed an Association Agreement with European Economic Community in 1972 and applied for European Union membership in 1990. Accession talks began in 1998 which were completed at the end of December 2002. On April 2003 Cyprus signed the Accession Treaty for to become a full member of the Union in May 2004.¹⁶The Annan Plan, a United Nations proposal to reunify the island, was put to a referendum on 24 April 2004. The referendum failed with 75% of the Greek Cypriots rejecting the plan while the 65% of Turkish Cypriots approved it. The Republic of Cyprus became a European Union member along with the whole island in May 2004. Turkey continued to hold Turkish military presence in the northern part of the island even after the accession of Cyprus to the EU membership.

1.2 Exploration Offshore Egypt

Egypt is the first significant case in the Mediterranean region in terms of ultra-deep water discoveries. Shell Oil Company made the first discovery in the Nile Delta region's North East Mediterranean (NEMED) block in 2003, followed by couple of more discoveries in the region in 2004. In 2006, ONGC Videsh Petroleum Company decided to drop out of NEMED block due to fears of project becoming unviable by the emergence of shale gas developments, particularly in United States.

¹⁶ European Commission Enlargement Archives.
http://ec.europa.eu/enlargement/archives/enlargement_process/past_enlargements/eu10/cyprus_en.htm

Today, Egypt's NEMED block is estimated to have 1.5 trillion cubic feet (tcf), or 42 billion cubic meters (bcm) of natural gas¹⁷. Egyptian state owned EGAS (Egyptian Natural Gas Holding Company) launched an international bidding round for 15 mainly onshore licenses (Gulf of Suez, Eastern and Western deserts and Sinai) in 2011¹⁸ and 15 mainly offshore licenses in the Mediterranean and Nile Delta in June 2012.¹⁹ This was an encouragement to the rest of the East-Mediterranean countries to search for oil and gas reserves in their territorial zones. In 2010, United States Geological Survey Agency estimated that there was 122 tcf (3,455 bcm) of recoverable natural gas and 1.7 billion barrels of recoverable crude oil in the Levant basin, south-east Cyprus and the north-east of the NEMED block.²⁰

1.3 Exploration Offshore Israel

Attempts for offshore explorations in Israel started in 1960's.²¹ First significant discovery was made in 1999 in Noah/Noa offshore field, followed by an additional reservoir discovery at "Mari-B" field in 2000.²² Noble Energy (US) and Israeli companies Avner, Delek Drilling, Isramco and Dor made the first large offshore discovery in Tamar 1 site, with Tamar gas field been the greatest gas reserve discovery in 2009. Dalit 1 site discovery happened shortly after the discovery of Tamar 1 in 2009, at a 100 km distance from Israel's northern coast. Delek has estimated that Tamar and Dalit fields contain 9 tcf (255 bcm) of natural gas, a quantity sufficient to meet Israel's gas needs for over 20 years.²³

¹⁷R. SuryAmurthy, "Shale lures ONGC to quit block", The Telegraph India, 20 February 2011.

http://www.telegraphindia.com/1110221/jsp/business/story_13611726.jsp

¹⁸ "Egyptian General Petroleum Company launches International Bid Round 2011", Deloitte.

http://www.psg.deloitte.com/NewsLicensingRounds_EG_110927.asp

¹⁹ "EGAS launches international oil and gas Bid Round 2012", Deloitte.

http://www.psg.deloitte.com/NewsLicensingRounds_EG_120607.asp

²⁰ "World Petroleum Resources Project, Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean, Fact Sheet 2010–2014", U.S. Geological Survey, March 2010.

²¹ Michael Gardosh, Yehezkel Druckman, Binyamin Buchbinder and Michael Rybakov, "The Levant Basin Offshore Israel: Stratigraphy, Structure, Tectonic Evolution and Implications for Hydrocarbon Exploration", 21 April 2008.

²² Ministry of Energy and Water Resources, Petroleum and Natural Gas Prospecting.

<http://energy.gov.il/English/Subjects/OilAndGasExploration/Pages/GxmsMniPetroleumAndNaturalGasProspecting.aspx>

²³ Delek Group, Holdings, Energy and Infrastructure,

<http://www.delek-group.com/Holdings/EnergyInfrastructure/DelekEnergy.aspx>

The Leviathan gas field, greatest gas discovery in the history of Israel and region, was discovered in 2010 by a consortium comprising Noble Energy, Delek Drilling, Avner Oil and Ratio Oil.²⁴ At the time Leviathan was estimated to hold 17 tcf (491 bcm) natural gas reserves. Other smaller discoveries include Dolphin and Tanin, while Pelagic, owned by Stenmetz, Sagui, Israel Opportunity and AGR Group, is estimated to hold 6.7 tcf (190 bcm). According to official Israeli data, Israel had 300 bcm proven gas reserves in 2011, mostly from the Tamar field. Israel Natural Gas Authority director general Yehosua Stern says that this number will likely to grow to 1300 bcm in the near future. Stern asserts, after production testing is completed in the Leviathan field, 300 bcm proven gas reserve figure would rise to 453 bcm and preliminary findings suggest the possibility of further large gas field discoveries, amounting to 550 bcm.

Map 1.1: Israel's Offshore Fields



Source: LNG World News²⁵

In June 2013 the Netanyahu government decided to export 40% of natural gas reserves. Petition that was submitted to Israel's Supreme Court to stop the export policy

²⁴ Noble Energy, Operations, Eastern Mediterranean, <http://www.nobleenergyinc.com/Operations/International/Eastern-Mediterranean-128.html>

²⁵ LNG World News. <http://www.lngworldnews.com/noble-energy-leviathan-resource-estimate-up-israel/>

of the Netanyahu government failed in October 2013 by a 5-2 ruling in favor of the government policy. Director General of the Ministry of Energy and Water Resources, Shaul Tzemach, submitted export recommendations to Prime Minister. Recommendation list sets a number of export conditions for Israeli natural gas, such as export quota would be determined according to maximum daily production limit for export purposes, licenses would be granted for a period of 25 years and Petroleum Commissioner would further examine license applicants to determine whether granting such licenses would contribute to the development of the energy market, increase energy competition, ensure energy security, maximize economic benefits, public security and interest. As export option is decided with Israel's Supreme Court ruling in October 2013, with Leviathan and Tamar fields, Israel would become a major energy player in the Middle East.

1.4 Exploration Offshore Cyprus

Explorations for hydrocarbons in Cyprus started in 2006 in an exploration area of 51,000 sq km offshore, which was divided into 13 blocks, that is a part of the exclusive economic zone (EEZ) proclaimed by the Republic of Cyprus.²⁶ This was followed by two new Exclusive Economic Zone (EEZ) delineation agreements -there was already one with Egypt, signed in 2003- with Lebanon (2007) and Israel (2010 - first exploratory drilling began on 2011).

When RoC announced its first international tender for three-year oil and gas exploration licenses, there were only three bids and Noble Energy was the only company. The natural gas discovery in Cyprus Block 12 has estimated gross mean resources of 7 trillion cubic feet exploration Offshore Cyprus.²⁷ The discovery well encountered 310 feet of net natural gas pay. The Block 12 field covers approximately 40 square miles and will require additional appraisal drilling.²⁸ Delek, Noble's partner in Aphrodite field, estimated the reserves a little lower 5.2 tcf³ (147 bcm) as Delek is a

²⁶ Ministry of Energy, Cyprus, Hydrocarbon Exploration, 2012.

http://www.mcit.gov.cy/mcit/mcit.nsf/dmlhexploration_en/dmlhexploration_en?OpenDocument

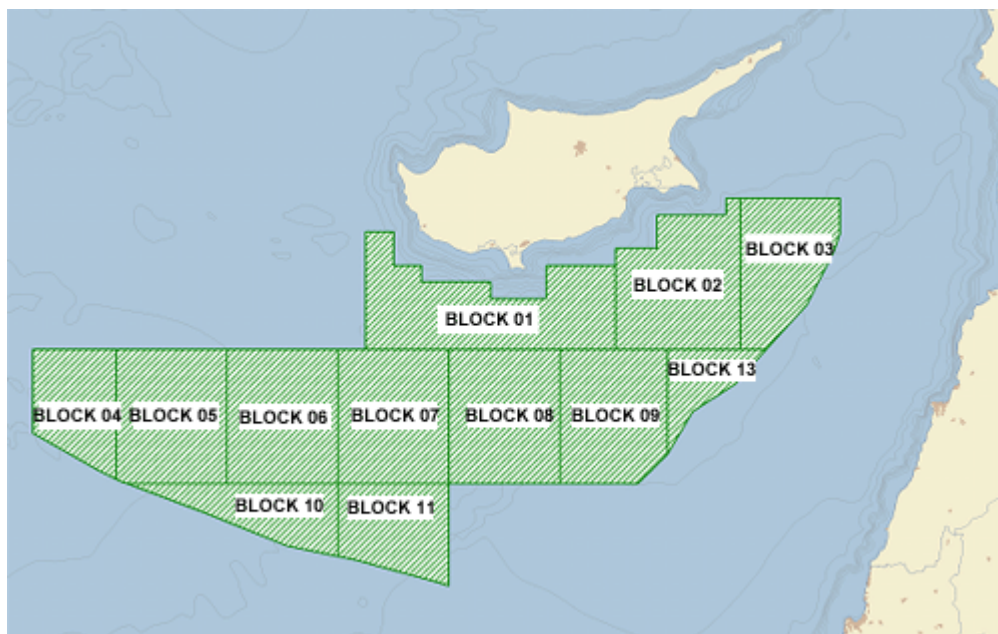
²⁷ Noble Energy, Operations, Eastern Mediterranean.

<http://www.nobleenergyinc.com/Exploration/Recent-Discoveries-130.html>

²⁸ Ibid.

company listed on the Tel Aviv Stock Exchange it is obliged to use different methods for estimation.

Map 1.2: Offshore Cyprus Hydrocarbons Exploration Blocks



Source: Deloitte.²⁹

Significant discoveries in the Israeli Leviathan block had also become an encouragement for the companies for their bids in the second licensing rounds on Cyprus block 12, launched on 11 February. Protests from Turkey did not stop the 15 bidders consisted of individual companies and consortia, and also a handful of oil and large gas companies like Total of France, Eni of Italy, Gazprombank of Russia, Petronas of Malaysia and Kogas of South Korea. Primary interest was in block 9, adjacent to block 12 and block 2, adjacent to block 9. The successful bidders for blocks 2, 3, 9 and 11 were announced at the end of October 2012. ENI and Kogas were initially invited to negotiate a contract for blocks 2 and 3. Total and Novatek for block 9, and Total by itself for Block 11. Talks with Total and Novatek over Block 9 were subsequently terminated and the government started negotiations for that block with the ENI-Kogas consortium instead. At the same time, it started talks with Total for Block 10 with Total alone.³⁰

²⁹ The Republic of Cyprus opens International Bid Round for twelve offshore blocks, Deloitte. http://www.psg.deloitte.com/NewsLicensingRounds_CY_120208.asp

³⁰ Ayla Gürel, Fiona Mullen and Harry Tzimitras, Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios, Prio Report, 2013.

CHAPTER TWO

There are several options of which some are listed and examined in the subsection of the introduction of this thesis. Academicians and policy makers consider these options with respect to when it comes to how to use Eastern Mediterranean energy reserves. All the options listed here give considerable benefits to regional countries. Also, disadvantages associated with any single option are also discussed below. Regional countries are actively considering these options but these options too, may not remain valid for long because of the fast changing geopolitical landscape and newly developed technologies. All of this reflects the dynamic nature of the geopolitics of energy.

This chapter examines six possible scenarios that Israel and Cyprus choose to pursue for their natural gas reserves. Each scenario tries to answer questions of whether an option is economically feasible, whether it is politically feasible in terms of agreement among the countries, whether it can play a role in developing cooperation and a peace-building measure. All scenarios examined in this chapter bear potential benefits and risks for the Israel and Cyprus. An economically viable scenario may not be politically viable for a country. Also, in order to use gas as a conflict resolution tool, countries can choose to disregard economic and political aspects. To understand where the current geopolitics of the region is headed, examination of this scenarios is crucial. Some of the scenarios include pipeline projects involving countries such as Egypt, Turkey and Greece. Some others involve LNG and Floating LNG facilities to export Eastern Mediterranean gas.

2.1. Scenario I: Arish-Ashkelon

Arish-Ashkelon pipeline project came to realization when Egypt and Israel agreed in 2005 to supply Egyptian natural gas to Israel Electric Corporation. Israeli Minister of Infrastructure Benjamin Ben-Eliezer and Egyptian Minister of Petroleum Sameh Fahmy signed the agreement, which had a 15 year life span with an option to

http://www.prio.no/Global/upload/Cyprus/Publications/Hydrocarbons_Report-ENG.pdf

renew it.³¹ According to the agreement, 100 km pipeline with a total capacity of 9 bcm a year would be built under the sea connecting Ashkelon to Arish. East Mediterranean Gas Company, which is a consortium of Mediterranean Gas Pipeline Ltd, Israeli Merhay, PTT and others, had taken the construction and operation obligations.³² Construction of submerged pipelines estimated to have cost \$469 m.³³ In February 2008, Egypt started to supply natural gas through the pipeline occurring to the initial agreement of 1.7 bcm annually to Israel.³⁴ Later on, this figure increased to 2.1 bcm a year, which corresponded to 40% of Israel's natural gas needs in 2009.

Egyptian activists who were concerned about the 2005 deal, tried to find a legal case against the project by claiming Egypt was selling its natural gas below the world gas prices. In November 2008, Egyptian court had overruled the agreement between Egypt and Israel by siding with the lawyer Ibrahim Yousri, who appealed to the court by claiming the Egypt was losing \$9m a day due to fixed-price sale to Israel.³⁵

However, this ruling did not have any effect on Egypt's natural gas deliveries as Egyptian government did not change its policy to supply gas to Israel. Mubarak's downfall in Egyptian revolution in 25 January 2011 marked an important point in the project's survival as gas deliveries became problematic due to bombings several times of pipelines in Sinai, which halted the deliveries for long periods of time.³⁶ On April 2012, EGAS canceled the natural gas agreement with Israel, claiming Israel was months late in its payments. President of the state-owned company, EGAS, said cancellation of the project was purely done for economic considerations and Israeli Prime Minister

³¹Shlomi Eldar, "Israel's Miscalculation on Egyptian Natural Gas", Al-Monitor, 12 September 2013. <http://www.al-monitor.com/pulse/originals/2013/09/israel-ariel-sharon-palestinians-egyptian-natural-gas.html>

³²"PTT buys 25% of East Mediterranean Gas Co.", Oil & Gas Journal, 7 December 2007. <http://www.ogj.com/articles/2007/12/ptt-buys-25-of-east-mediterranean-gas-co.html>

³³Jodi Sanger-Weaver, "Egypt- Israel, And The Arish-Ashkelon Pipeline Controversy", Prospect, 24 January 2012.

<http://prospectjournal.org/2012/01/24/egypt-israel-and-the-arish-ashkelon-pipeline-controversy/>

³⁴Nassir Shirkhani, "Egyptian gas flows to Israel", Upstream, 10 March 2008.

<http://www.upstreamonline.com/live/article1153755.ece>

³⁵"Egypt court freezes Israel gas deal", Al Jazeera, 18 November 2008.

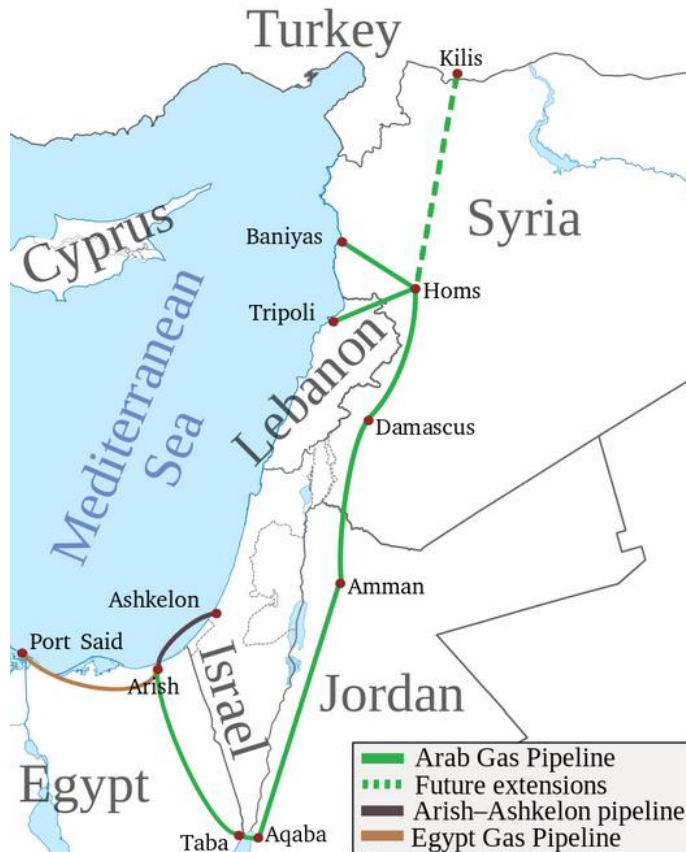
<http://www.aljazeera.com/news/middleeast/2008/11/2008111895917929279.html>

³⁶Stratfor, "Egypt's Dilemma After Israel Attacks", Business Insider, 19 August 2011.

<http://www.businessinsider.com/egypts-hamas-dilemma-after-attacks-in-israel-2011-8>

Benjamin Netanyahu also said cancellation of the natural gas agreement was not politically motivated.³⁷

Map 2.1: Arish-Ashkelon, Arab Gas Pipeline (AGP)



Source: Hydrocarbons-technology³⁸

Egypt has a growing population with a yearly growth rate of 1.7%.³⁹ Domestic natural gas consumption in Egypt is also rising, with a 10% rate annually over the past 3 years.⁴⁰ In 2012, domestic gas consumption in Egypt was 55 billion cubic meters while it produced only 60 billion cubic meters.⁴¹ As the consumption rate increased to the

³⁷Edmund Sanders, “Egypt-Israel natural gas deal revoked for economic reasons”, Los Angeles Times, 23 April 2012.

<http://articles.latimes.com/2012/apr/23/world/la-fg-egypt-israel-oil-20120424>

³⁸Arish-Ashkelon, Arab Gas Pipeline (AGP), Hydrocarbons-technology.

<http://www.hydrocarbons-technology.com/projects/arab-gas-pipeline-agp/arab-gas-pipeline-agp1.html>

³⁹ World Bank, “Population growth (annual %)”.

<http://data.worldbank.org/indicator/SP.POP.GROW>

⁴⁰ Daria Solovieva , “Why Is Egypt Importing Natural Gas?”, Egypt Oil & Gas, 2013.

http://www.egyptoil-gas.com/read_article_issues.php?AID=623

⁴¹ Nadine Marroushi, “Egypt: natural gas in abundance but every day brings power cuts”, Financial Times, 18 December 2013.

<http://www.ft.com/intl/cms/s/0/5aabd292-52c1-11e3-8586-00144feabdc0.html#axzz2pqOT0tiZ>

level of the production rate, Egyptian Petroleum Ministry announced on 17 December 2012 that Egypt had become a gas importing country.⁴²

In order to compensate its gas deficit Egypt needed to buy some portion of its natural gas needs from abroad. One of the less costly options for Egyptians is to get newly discovered Israeli natural gas through the already established Arish-Ashkelon pipeline. Through technological and mechanical modifications to the pipeline, Leviathan gas can be supplied to Egypt. Arish-Ashkelon pipeline was bombed dozens of times in the past, which makes this option a risky choice for both countries. In addition, Israel would not enter a project if its possible material benefits do not outperform the possible costs and the risks.

For Egypt, Arish-Ashkelon pipeline would not be a suitable option due to pipeline security reasons. Pipelines that connect Israel and Jordan to Egypt are situated at the Sinai Peninsula and Egypt was unable to secure the region from terrorist attacks since the ousting of Hosni Mubarak.⁴³ Egypt needs a stable natural gas supply to meet its growing domestic gas demand, and therefore, without any political considerations to be made, security of Sinai Peninsula needs to be established before the any talk of Israeli natural gas supply through Arish-Ashkelon pipeline.

As it is an already established pipeline, connected with LNG terminals Damietta and Idku at the end of the route, there won't be any additional costs of construction. The option proposed change of direction of flow in the pipeline by an engineering alteration, which would need a small budget. So, it can be clearly said that Arish-Ashkelon Pipeline Scenario is economically feasible. The scenario is politically a challenge in terms of agreement between the countries. It includes risks of repercussions on domestic politics for both the Israeli and Egyptian politicians, considering the troubled past of the relationship between the two countries and the current political turmoil on the region.

Another important fact that aggravates the solution in political terms is the fragile environment that escalated after the Egyptian Revolution. It is true that political agreement within the countries is challenging, yet it is too early to say that the scenario

⁴² Al-Masry Al-Youm, "Egypt officially becomes gas-importing country to meet demand", Egypt Independent, 19 December 2012.

<http://www.egyptindependent.com/news/egypt-officially-becomes-gas-importing-country-meet-demand>

⁴³ "Blast hits gas pipeline between Egypt, Jordan", Reuters, 6 July 2013.

<http://www.reuters.com/article/2013/07/07/us-egypt-protests-pipeline-idUSBRE96601I20130707>

is not feasible in political terms. The political and economic conditions of the Arish-Ashkelon Pipeline Scenario, as stated above, will be the core elements in determining the role that it will play in terms of developing cooperation between Israel and Egypt. As these conditions, especially political situation is still unclear, it is not possible to make an estimation in terms of conflict resolution or cooperation in developing full implications of this scenario.

2.2. Scenario II: Peace

Recent natural gas discoveries in the East Mediterranean Sea changed the already complicated regional dynamics further into a more complex one as littoral countries started to claim and publicly announce their clashing interests with one another.⁴⁴ Israel announced that, with Cyprus, they would co-develop fields in the territorial waters of Cyprus. Turkey sent warships into the area objecting to the deal Cyprus had made with Israel, claiming the northern part of the island was not a part in the negotiations.⁴⁵

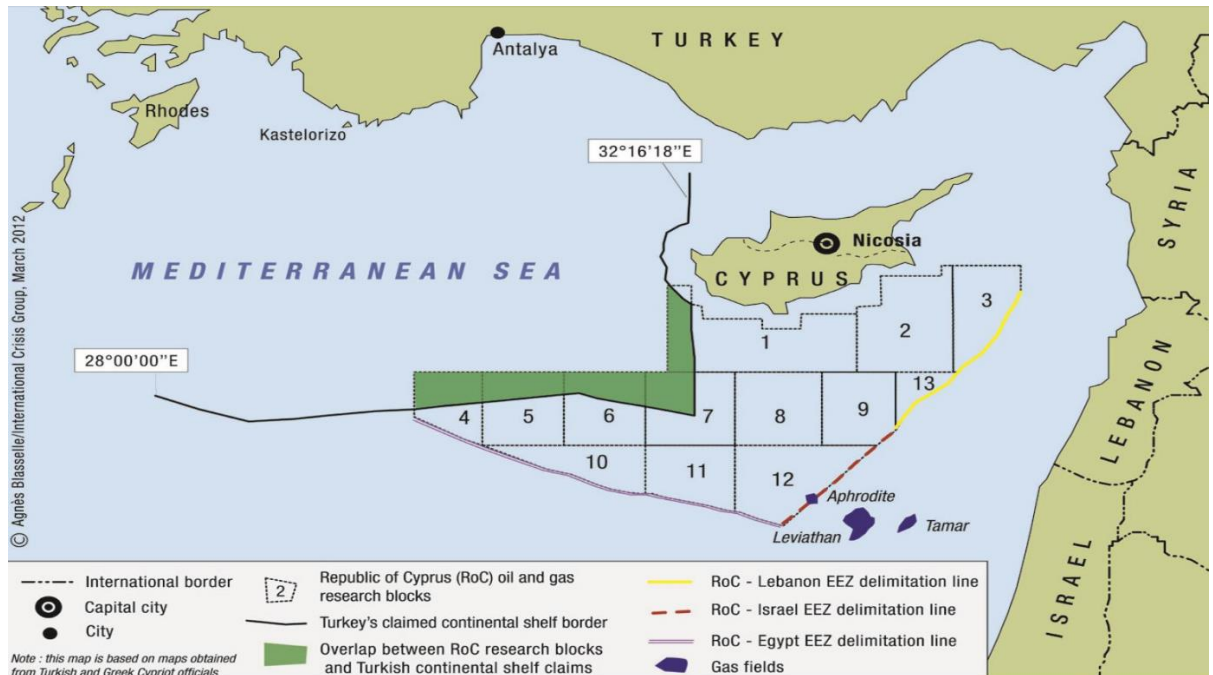
This move presents us a dark image of the region's future. Although natural gas reserves became another source of conflict in an already conflicted part of the world, reserves can also serve the littoral countries as a tool to help create peace in the long term. This scenario looks at three neighbors of Israel, Egypt, Lebanon and Palestine, and tries to examine the possibility of using natural gas as a tool for conflict resolution. Economic viability of options generally did not get much focus in here as this scenario's main aim is not economic benefits but the establishment of peace-building measures. Thus, economic and political calculations were given second place, whereas peace-building and conflict resolution dimensions were given the main importance in the following country subsections.

⁴⁴ "Gas Finds Complicate Eastern Mediterranean Security", International Relations and Security Network, 26 June 2013.

<http://isn.ethz.ch/Digital-Library/Articles/Detail/?lng=en&id=165423>

⁴⁵ Anshel Pfeffer, "Turkey to deploy warships over gas dispute with Cyprus", Haaretz, 25 September 2011. <http://www.haaretz.com/news/diplomacy-defense/turkey-to-deploy-warships-over-gas-dispute-with-cyprus-1.386659>

Map 2.2: The Republic of Cyprus EEZ delimitations and hydrocarbon research blocks and Turkey's continental shelf claims



Source: International Crisis Group⁴⁶

2.2.1. Palestine:

Israeli natural gas can be used as a confidence-building tool in negotiations with Palestinians. However, confidence-building measures would be best used when some peace framework was already in place, such as established communication channels which would provide information on the activities of relevant parties.⁴⁷ Also, sharing natural gas resources with Palestinians for peace purposes would be a politically risky move. Nationalistic reactions would prevent any such attempt, so decision makers would need to carefully craft such a scheme.

British Gas Company found a large natural gas reservoir in 2000, named Gaza Marine, 32 km west of Gaza Strip inside of Gaza territorial waters.⁴⁸ Back then Ariel Sharon government did not put its support behind the project due its lack of trust in

⁴⁶The Republic of Cyprus EEZ delimitations and hydrocarbon research blocks and Turkey's continental shelf claims, International Crisis Group, 2 April 2012.

⁴⁷ Confidence and security building, OSCE.

<http://www.osce.org/fsc/44569>

⁴⁸Nafeez Mosaddeq Ahmed, "Israel's War for Gaza's Gas", *Le Monde diplomatique*, November 2012. <http://mondediplo.com/blogs/israel-s-war-for-gaza-s-gas>

Palestinians with regard to on how they would handle the wealth they would receive.⁴⁹ Sharon saw Egyptians as a more reliable and trustworthy business partner than Palestinians and signed a natural gas agreement with Egypt in 2005.⁵⁰ British Gas continued to lobby to develop the fields.⁵¹

By putting support behind the Gaza Marine project, development of the Gaza Marine fields' 30 bcm reservoirs can help Israel to release some of the pressure it had endured over the years.⁵² If also a decision is made to develop Gaza Marine, estimated cost would be \$2.5 billion.⁵³ Development of these fields can become a precursor of future energy cooperation with Palestinians, which would help to achieve a long lasting solution to Palestine question.

Map 2.3: Overlap of maritime border claims by Israel and Lebanon



Source: Natural Gas Europe.⁵⁴

2.2.2. Lebanon:

Lebanon's territorial claims in East-Mediterranean Sea are troubling for Israelis.⁵⁵ But, if the political climate becomes suitable for both sides to reach an

⁴⁹Shlomi Eldar, "Israel's Miscalculation on Egyptian Natural Gas", Al-Monitor, 12 September 2013. <http://www.al-monitor.com/pulse/originals/2013/09/israel-ariel-sharon-palestinians-egyptian-natural-gas.html>

⁵⁰Amiram Barkat, "Israel in secret talks with BG on Palestinian gas", Globes, 13 March 2013. <http://www.globes.co.il/serveen/globes/docview.asp?did=1000829662&fid=1725>

⁵¹*Ibid.*

⁵²*Ibid.*

⁵³*Ibid.*

⁵⁴ "Lebanon: Israel's Intent to Unilaterally Demarcate its Maritime Borders Violates International Law", Natural Gas Europe. <http://www.naturalgaseurope.com/lebanon-israel-maritime-borders-international-law>

⁵⁵ Herb Keinon, "Israel irritated at UN for nodding at Lebanese gas claims", The Jerusalem Post, 1 December 2011.

understanding in sharing natural gas reserves, this would have greater regional effects. However, chances of Lebanon accepting any Israeli offer or vice versa on natural gas reserves are quite dim. Israelis would not want to share natural gas reserves in which they have already invested politically and economically.⁵⁶ Also, Hezbollah in Lebanon would not accept any agreement that would potentially share Lebanese natural gas with Israel.⁵⁷

2.2.3. Egypt:

For quite some time Israel was getting a portion of its natural gas needs from Egyptian supplies. In 2005, the two sides agreed on Egyptian natural gas supply to Israel for over 20 years, annually 7 bcm. Problems with Egyptian-Israeli pipeline made Egyptian gas unreliable for Israelis. Until the disruption of the natural gas deal in 2012 by Egyptian Natural Gas Holding Company, the pipeline between Egypt and Israel was bombed over 15 times, which negatively affected the natural gas prices in Israel due to supply shortages.⁵⁸

Since 2012, decision makers in Egypt have not been in favor of exporting their natural gas to Israel. There are two reasons for this Egyptian behavior. Firstly, due to ousting of Mubarak and the political instability that came with it, decision to export natural gas to Israel would take a toll on the Political of Egyptian leadership. Secondly, for decades, the Egyptian population graphic portrayed a stable growth.⁵⁹ Population increase in Egypt also would increase Egypt's energy consumption levels in upcoming years. Israel can supply natural gas to Egypt by an already existing pipeline between two countries. Also, not only this exchange would ensure two sides that they have more to gain if both cooperated in energy fields, but also their cooperation would give more tools for achieving peace in Levant region.

Egyptian politics has evolved away from its authoritarian tradition, thus, domestic political calculations in both countries increases the unlikelihood of this

<http://www.jpost.com/National-News/Israel-irritated-at-UN-for-nodding-at-Lebanese-gas-claims>

⁵⁶Yahya Dbouk , "Israel Accuses Lebanon of Stealing Its Gas and Oil", Al-Akhbar English, 3 October 2013. <http://english.al-akhbar.com/node/17222>

⁵⁷ "Hezbollah: Lebanon will not let Israel seize its natural gas", Haaretz, 14 July 2011.

<http://www.haaretz.com/news/diplomacy-defense/hezbollah-lebanon-will-not-let-israel-seize-its-natural-gas-1.373201>

⁵⁸Gabe Khan, "Egyptian Gas Stoppage to Cost Israel \$1.5m Per Day", Arutz Sheva, 28 April 2011.

<http://www.israelnationalnews.com/News/News.aspx/143760#.Us3fprTJa4k>

⁵⁹ World Bank, "Population growth (annual %)", <http://data.worldbank.org/indicator/SP.POP.GROW>

option. However, when regional dynamics change into a more favorable atmosphere, Israeli natural gas exports would be a positive development for security and stability for the region.

2.3. Scenario III: Turkey

One of the export options that Israeli political establishment thinking seriously about is building a pipeline to Turkey. Relationship between two countries has been shaken by a series of events over the past years. Israel launched a military operation on Gaza in 2009 when Turkey was acting as a negotiator between Israel and Syria. In 2009, referring to the military operation of Israel in Gaza, Turkish Prime Minister Erdoğan stormed out of a Davos panel with words directed at Israeli President Peres “When it comes to killing, you know well how to kill”.⁶⁰ Gaza Flotilla that aimed to break the Israeli blockage of Gaza Strip and bring aid to the city was stopped by the Israeli Navy on 31 May 2010. The Turkish Mavi Marmara ship was raided by Israeli Navy personnel, who killed nine Turkish citizens. The Mavi Marmara incident put a complete freeze to an already unstable Turkish-Israeli relationship.

In 1990’s two countries enjoyed cooperation on military equipment and intelligence sharing.⁶¹ Their alliance considered to be “anchor of stability in a changing region” by U.S. senior officials.⁶² Over the years, unaffected by the stormy relationship two sides had, Turkey and Israel’s total trade volume has continuously increased, reaching \$4 billion in 2012.⁶³ In March 2013, Prime Minister Netanyahu apologized for the Mavi Marmara affair and announced that Israel was ready to compensate to families for the losses.⁶⁴ Still, even if the rapprochement process takes time to heal a deeply

⁶⁰Katrin Bennhold, “Leaders of Turkey and Israel Clash at Davos Panel”, The New York Times, 29 January 2009. http://www.nytimes.com/2009/01/30/world/europe/30clash.html?_r=1&

⁶¹ Dan Arbell, “Turbulence in Turkey–Israel Relations Raises Doubts Over Reconciliation Process”, Brookings, 1 November 2013.

<http://www.brookings.edu/blogs/up-front/posts/2013/11/01-turkey-israel-reconciliation-arbell>

⁶²*Ibid.*

⁶³Busra Ozerli, “Economic ties grow despite political fluctuations between Israel, Turkey”, Today’s Zaman, 28 July 2013.

<http://www.todayszaman.com/news-321902-economic-ties-grow-despite-political-fluctuations-between-israel-turkey.html>

⁶⁴Harriet Sherwood, “Netanyahu apologizes to Turkish PM for Israeli role in Gaza flotilla raid”, The Guardian, 22 March 2013.

<http://www.theguardian.com/world/2013/mar/22/israel-apologises-turkey-gaza-flotilla-deaths>

damaged relationship, it is probable that the two sides can come to an understanding on energy issues, such as the proposed pipeline project.

Map 2.4: Routes of TAP and TANAP pipelines



Source: Trans Adriatic Pipeline⁶⁵

According to a study done by the Turkish energy company Turcas, for a distance of 470 km, ranging from Israel to Turkey, \$2.5 billion will be required to construct a pipeline under the sea.⁶⁶ This cost estimate was made on the basis of two 8 bcm capacity pipelines to be placed side by side. Pipelines would be constructed from the Leviathan reserves to either Ceyhan or Mersin in Turkey. The Ceyhan option seems to be more suitable option as it would be more efficient to connect pipelines to Anatolian natural gas corridor. For a 40 km pipeline, this would additionally increase the cost of the project by an \$83 million.⁶⁷ Another \$647 million would be required to build a connection between Ceyhan and TANAP (Trans Anatolian Natural Gas Pipeline) for the Leviathan gas to reach Europe. If the Trans-Adriatic Pipeline (TAP), is to be chosen instead of TANAP, 1,215 km of pipelines would be needed to be built from Ceyhan to

⁶⁵ Trans Adriatic Pipeline.

<http://www.trans-adriatic-pipeline.com/why-tap/southern-gas-corridor/>

⁶⁶Matthew J. Bryza, “An Israel–Turkey Natural Gas Pipeline: inter-connection of commercial and geopolitical logic”, Oxford Energy Forum, Issue 93, August 2013.

<https://www.oxfordenergy.org/2013/10/issue-93-august-2013/>

⁶⁷*Ibid.*, pp. 11

Turkey-Greece border with a cost of \$1.93 billion. For the Leviathan gas to reach European markets, if the TANAP option is chosen, the total project would cost an estimated \$3.12 billion.⁶⁸ TAP option would increase the estimated cost of the project to \$4.4 billion.

To reach European markets, the Turkey scenario is the most commercially attractive option for Israel. Other options, such as Floating LNG, LNG platform in Vassilikos or Eastern-Mediterranean pipeline project does not give the same economic efficiency as Turkey option. However, the relationship between Israel and Turkey still remains problematic even if some steps have been taken to ease it up. The current government in Turkey would not want to enter any visible economic relationship with Israel in the near future due to Turkey having three elections in 2014-2015. Also, after the Egyptian revolution and energy cost spikes in Israel due to problems in the Egyptian natural gas pipeline, Israel is more careful not to rely on third countries for its energy dealings.

Building a pipeline to Turkey is one of the few feasible options in terms of economic viability, and maybe the best one in terms of reaching the European market. Looking at all the cost calculations stated above, it can be said that this scenario is economically feasible. On the other hand, it does not seem politically possible in terms of an agreement between the countries due to the turbulent and dynamic relationship. Progression in terms of policy coordination in trade and military deals and diplomatic initiatives especially in international arena cannot be undermined. However, due the fragile relationship between the parties, which is a result of the various political disputes in the past, reconciliation is not foreseeable in the near future, at least to facilitate such a territorial and cooperation.

2.4 Scenario IV: Floating LNG Facility

One of the alternative solutions for this dispute is to set up a Floating Liquefied Gas Facility (FLNG) to process and transport the gas. Floating liquefied natural gas (FLNG) refers to water-based liquefied natural gas (LNG) operations employing technologies designed to enable the development of offshore natural gas resources.

⁶⁸My own calculation according to data provided in Matthew J. Bryza's Oxford Energy Forum paper.

Israel may set up this FLNG installation off the Mediterranean coast, beginning with the Tamar FLNG project, followed by the beginning of operations by 2017. The FLNG facility would draw on volumes from the nearby Tamar and Dalit fields and be able to export up to 3 million tons per year (144 Bcf per year). This option is likely to cost around \$5 billion.

The first development of FLNG was initiated by Shell with the Au\$12bn Prelude Project, which covers 200 kilometers (120 mi) offshore Western Australia. Royal Dutch Shell made their investment decision public on 20 May 2011 and initiated the construction in October 2012. In theory, the FLNG will produce, liquefy, store and transfer LNG (and potentially LPG and condensate) at sea before carriers ship it directly to markets.

Although it seems feasible and innovative, there are several challenges for this floating liquefied natural gas facility. In terms of the design and construction of the FLNG facility, every element of a conventional LNG facility needs to fit into an area roughly one quarter the size, whilst maintaining the utmost levels of safety and giving increased flexibility to LNG production.⁶⁹ Wave motion is also an important challenge once the facility starts operating. Due to harsh weather conditions in open seas, LNG containment systems must have good resistive measures to withstand sea waves and storms, which ultimately affect the stability of LNG tanks. Possible solutions for reducing the effect of weather and motion should be found in designs that must be capable of withstanding and reducing the impact of waves.

Despite the challenges, the project is still appealing due to substantial advantages. FLNG technology is environmentally advantageous. First, natural gas is one of the cleanest-burning fossil fuel. Moreover, natural gas is abundant and affordable, and may have the capacity to respond the need for world energy through realization of the potential of otherwise unviable gas reserves.

Because the facility is operated in the sea, constructing pipelines on the shores is not necessary. As Shell Australia Chairman Ann Pickard stated during the construction process of Prelude FLNG facility, developing a floating LNG technology reduces the

⁶⁹Chen Hwa-Chiu, "Commercial And Technical Considerations In The Developments In The Offshore Liquefaction Plant", 23rd World Gas Conference Amsterdam, 2006.
<http://www.igu.org/html/wgc2006/pdf/paper/add11306.pdf>

project's cost and environmental footprint as it removes the need for offshore platforms, long pipelines to shore, near shore works such as dredging and jetty construction, and onshore development such as building roads, lay down areas and accommodation facilities.⁷⁰ As there will be no construction or deconstruction of the facilities, there will not be any possible harm to marine and costal environments. Also, in times of need, the facility can easily be disconnected and removed, before being refurbished and re-deployed elsewhere. While one of the main concerns of LNG facilities is the high cost of pumping the gas to shore, FLNG is a more feasible option in this case. In addition, this may set an example for new business prospects for countries to build FLNG facilities for fields that would otherwise remain disconnected and unreachable, such as those off the coast of East Africa up to the present day.

The FLNG facility will be moored directly above the natural gas field, it will route gas from the field to the facility via risers. When the gas reaches the facility, it will be processed to produce natural gas, LPG, and natural gas condensate. The processed feed gas will be treated to remove impurities, and liquefied through freezing, before being stored in the hull. Ocean-going carriers will offload the LNG, as well as the other liquid by-products, for delivery to markets worldwide. The conventional alternative to this would be to pump gas through pipelines to a shore-based facility for liquefaction, before transferring gas for delivery.⁷¹

In the case of Israel, a Floating LNG facility may be positioned over the producing field, and tankers being loaded would be positioned alongside it. As mentioned above, an FLNG facility will be cheaper, as it reduces the need for expensive and complex undersea pipelines. As the facility is not stable, its position can be changed between the fields. Noble Energy is evaluating FLNG for the Tamar field, envisioning a capacity of 3.4 million tons per annum (mtpa) and a target start-up in 2018.⁷²

Daewoo Shipbuilding and Marine Engineering (DSME) signed an agreement with Noble Energy led consortium for to do a feasibility study of constructing a floating

⁷⁰ "Australia: Shell Prelude LNG Project gets Federal Approval", The Global Herald, 15 November 2010. <http://theglobalherald.com/australia-shell-prelude-lng-project-gets-federal-approval/7000/>

⁷¹ "A revolution in natural gas production", Shell. <http://www.shell.com/global/aboutshell/major-projects-2/prelude-flng/revolution-natural-gas-production.html>

⁷² Simon Henderson, "Natural Gas Exports For Israel and Cyprus", German Marshall Fund, 2013. <http://www.washingtoninstitute.org/uploads/Documents/opeds/Henderson20130901-NaturalGasExportOptions.pdf>

LNG platform. Russian state owned Gazprom Company also signed a non-binding letter of intent with DSME to purchase LNG from the FLNG platform when the project successfully reaches to completion. By being the first vessel that will be completed and being operationalized offshore Australia; FLNG continues to push the technological boundaries. In order to be a strategic partner of Leviathan's investment, the Australian company Woodside Petroleum initiated negotiations with Noble Energy and its Israeli partners.

Despite the advantages, there are several disadvantages to this option. Floating LNG facility is a big installation, which will always be vulnerable to attack by anti-ship missiles or even rocket-propelled grenades. Current turmoil in Syria exposed many weapons to non-state actors which can potentially be used to launch terror attacks on FLNG. Also, most countries in the region have large amounts of missile arsenal as their disposal, giving them the capability to make threats or even act on such threats. On the other hand, industry experts play down the security risk and predict that the attractiveness of FLNG, not only in the Eastern Mediterranean but also other parts of the world, will lead to breakthroughs in technology, cost constraints and commercial viability.⁷³

2.5. Scenario V: Eastern-Mediterranean Pipeline Project

European Commission's approval of East-Med Pipeline project as a Project of Common Interest (PCI) surfaced once again probability of realization of the project.⁷⁴ Several EU criteria met by the East Med pipeline can be listed as follows: the pipeline facilitates access to sources of supply that regarding diversification of sources, counterparts, and routes and hence contributes to competition inter alia. Moreover, it encourages market integration and interoperability through connecting Cyprus to the EU mainland. The pipeline has a potential influence on security of supply beyond Cyprus and Greece to Bulgaria, Italy and the SEE. Beside the already existing route via Turkey, the pipeline constructs a new one for Caspian gas, which makes it meet the Europe's necessary criteria for alternative routes. Keeping in mind the Russia-Ukraine

⁷³*Ibid.*

⁷⁴ "Greece, Cyprus Push for East Med Pipeline Amidst Difficulties", Natural Gas Europe, 29 November 2013.
<http://www.naturalgaseurope.com/greece-cyprus-east-med-pipeline>

crisis that occurred in 2009, which also disrupted supplies transported through Turkey, the significance of this cannot be overemphasized. Regarding the reverse-flow infrastructure of the East Med, it might enable provision of supplies from Italy and North Africa towards the southeast.

The technical feasibility of the project is indicated by studies. Although the maximum water depth of 2,873 m constitutes a challenge, required engineering is similar to already completed projects such as the planned Galsi and Medgaz. While the approach to Crete is considered complex because of the rough sea bed, it still does not cause insurmountable problems and the project already defines a marine survey scope.

Map 2.5: Eastern-Mediterranean Pipeline Project



Source: Interfax Energy⁷⁵

It is known that it is expensive to establish a major energy infrastructure. The EU estimates that to cover gas needs from 2010 to 2020, investments of €70bn are required; this sum includes import pipelines, interconnectors, reverse flow, storage, and LNG.⁷⁶ This total covers import pipelines, interconnectors, reverse flow, storage, and LNG. As expected, one of the criteria for PCI status requires project's overall benefits

⁷⁵ A third gas corridor: prospects for the East Med, Interfax Energy. <http://interfaxenergy.com/natural-gas-news-analysis/middle-east/a-third-gas-corridor-the-prospects-for-an-east-med-gas-pipeline-to-europe/>

⁷⁶Dimitris Manolis and Elsa Loverdos, "The East Med Pipeline", Oxford Energy Forum, Issue 93, August 2013.

to exceed its costs. Generating a new corridor from the Eastern Mediterranean to Europe is more costly regardless of the choice between LNG and a pipeline. The East Med's costs (from source to Italy) are estimated at €6bn and would be realized with Project financing probably consisting of 70 per cent debt and 30 per cent equity.⁷⁷ As potential sources for facilitating financing, European institutions have increasingly focused on energy, with the European Bank for Reconstruction and Development having contributed around €8bn since 1991 and the European Investment Bank more than €55bn since 2000 (27 per cent on gas).⁷⁸

Furthermore, as part of PCI the provisions of Regulation 347/2013, which was mainly designed to encourage investment, would facilitate the East Med's development, through focusing on obstacles with respect to regulatory issues, granting of permits, and financing. It provides several advantages to increase investment, which can be argued as following: "preferential treatment for PCI's, streamlined permit procedures, a clear regulatory framework, long-term incentives for investments including the obligation on national regulatory authorities to grant risk-related incentives through tariffs (anticipatory investments, early recognition of costs incurred, additional return, etc.), and appropriate cost allocation to enable investments with cross-border impact."⁷⁹

Moreover, as part of PCI the East Med possesses eligibility for financial support, including grants for studies and financial instruments from CEF (Connecting Europe Facility). Even though the Commission's initial proposal of €41.2bn for CEF has decreased to almost €30bn, where €5,126 million directly goes to the energy sector, the instruments will help projects leveraging more private investments.⁸⁰ Especially important for investors, though, the analysis indicates that the East Med would provide competitive tariffs that are lower than the tariffs of an LNG plant. Hence this makes the project less prohibitive than has been considered. For instance, in case of exports to Italy and SEE, the costs associated with LNG would be three times of the pipeline's average transportation tariffs. While the tariff of LNG to Italy and SEE would change between 54% and 100%, the corresponding pipeline tariff to Italy via Greece would range between 43% and 51%. Actually, this can be compared to the transportation of

⁷⁷*Ibid.*

⁷⁸*Ibid.*

⁷⁹List of Projects of Common Interest, European Commission, 20 November 2013.

http://ec.europa.eu/energy/infrastructure/pci/doc/2013_pci_projects_country.pdf

⁸⁰Dimitris Manolis and Elsa Loverdos, "The East Med Pipeline", Oxford Energy Forum, Issue 93, August 2013.

gas from the Caspian to Europe via Turkey and Greece, considering the range of their tariffs that change between 31% and 68%.⁸¹

According to calculations stated above, Eastern Mediterranean Pipeline Scenario is not feasible in economic terms, even though it is a Project of Common Interest approved by European Commission. In contrast, it is considered as politically feasible, and the project's approval by European Commission as a PCI is an indicator of it. The project is actually not playing a role in terms of playing an active role of developing cooperation, as there is already cooperation and the project is positioned according to and by the help of it.

2.6 Scenario VI: Vassilikos LNG Terminal

Vassilikos option entertained by Israel and Cyprus will jointly operate an LNG plant that would serve as their natural gas to enter to a liquefaction process. The facility will also enable the parties to export the gas by ship to Greece for regasification. The Project is supported by Cypriot government and Noble energy, although there exists series of weaknesses as well as the strengths.

A memorandum of understanding had been signed between Total and the Cypriot government to build a LNG facility in Vasilikos. According to this agreement the construction of LNG trains is expected to start in 2016. Total also had the exploration license for blocks 10 and 11 of Cyprus' exclusive economic zone, in February 2013. On June 2013, to plan LNG facility in the Cyprus, American Noble Energy signed a memorandum of understanding with Israeli Delak and Avnar. Italy's ENI and South Korea's Kogas have respectively %80 and % 20 interests in Blocks 2, 3 and 9 of the island's EEZ. During a meeting with the President of Cyprus Nicos Anastasiades, ENI's CEO Paolo Scaroni revealed the Italian company's interest in eventually participating in the LNG Project should its exploration activities off the

⁸¹*Ibid.*

shores of the island prove to be successful.⁸² ENI plans to start the exploratory drilling in 2014.⁸³

A press release had been made by Noble Energy on 3 October 2013, which mentions that one appraisal well drilled at Block 12, offshore Cyprus has encountered approximately 120 feet of net natural gas. According to Noble Energy Vice President Keith Elliott, Cyprus A-2 field showed substantial amounts of recoverable natural gas and further appraisal activities would be needed to discover other Cyprus gas fields.⁸⁴

In the Mediterranean region, several LNG regasification terminals can serve as entry points to Europe. This option would allow the Eastern Mediterranean LNG to avoid being restricted to a particular market. On the other hand, the European Investment Bank (EIB) considers building a Cyprus LNG facility as a valid investment option. The Bank has already raised a loan worth of €130million for reconstructing the power station exploded in July 2011 at Vasilikos area.⁸⁵

This kind of an LNG facility will able the Cyprus to be flexible enough in terms of monetization of its funds by reaching European and Asian markets, it should be mentioned that any agreements signed between the government and the companies regarding the building of the facility are not binding. Cyprus' EU membership is a great advantage to the island for entering the gas market, but the discovery of additional amounts of natural gas is essential for the justification of the economic feasibility of the project.

Given the field proximity of Leviathan to the Aphrodite field, a joint LNG plant at Vassilikos looks like the most sensible option in economic terms. Besides, it seems to be the only realistic and viable option for EU to receive Israeli and Cypriot natural gas. Moreover, the Cyprus National Hydrocarbons Company (CNHC) stated that they consider the LNG plant at Vassilikos as the only viable economic solution to Cyprus'

⁸²Koran Ayat, "Cyprus and Total Sign MOU To Build Vassilikos LNG Facility", Natural Gas Europe, 8 November 2013.

<http://www.naturalgaseurope.com/cyprus-total-sign-mou-vassilikos-lng-facility>

⁸³*Ibid.*

⁸⁴"Noble Energy Announces Appraisal Drilling And Flow Test Results Offshore Republic Of Cyprus", 3 October 2013.

<http://investors.nobleenergyinc.com/releasedetail.cfm?ReleaseID=794694>

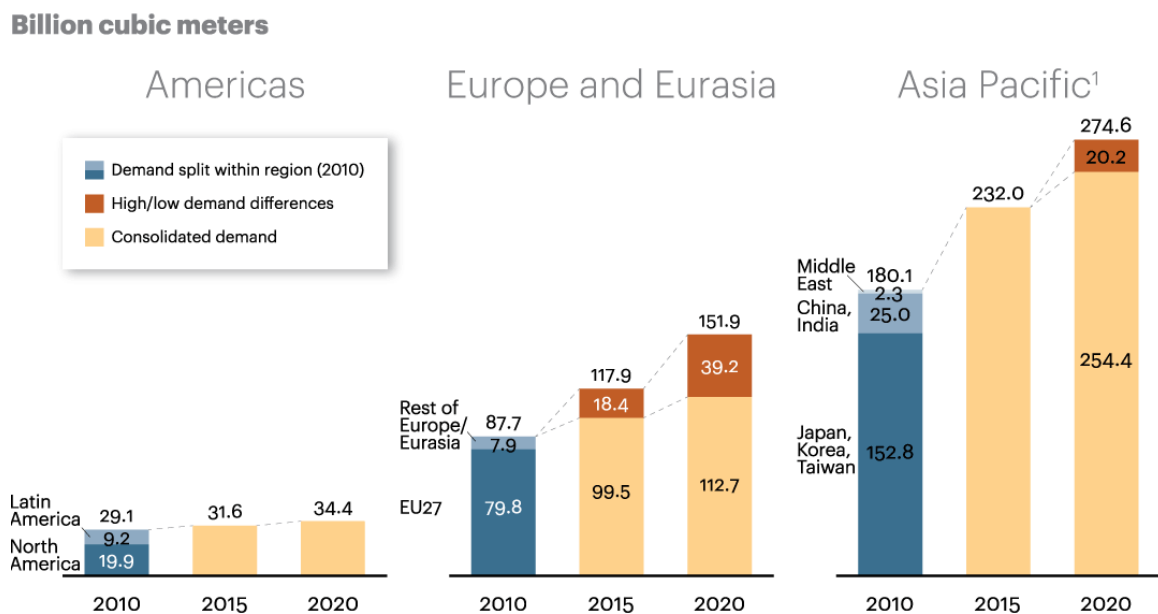
⁸⁵"Cyprus: Vital EIB Support of EUR 130 million for energy production", European Investment Bank, 8 March 2012.

<http://www.eib.org/projects/press/2012/2012-035-cyprus-vital-eib-support-of-eur-130-million-for-energy-production.htm>

gas exports. Involved in other significant discoveries beside Aphrodite in the Cypriot EEZ, the CNHC also claims that this project has the best destination for Israeli gas as well as the Lebanese gas that has not discovered yet.

The commercial viability arguments are based on decreasing cost of a facility with increasing number of trains. Accordingly, establishing a regional LNG hub at Vassilikos with one train facility would cost \$6 billion, in addition to a \$3 billion of infrastructure cost. Whereas expanding it to a two-train facility would only add \$3 billion to the budget, which increase total expenditure to \$12 million. A three-train facility would only cost \$15 billion with respect to similar calculations.⁸⁶

Figure 1.1: Projected LNG demand by region through 2020



Source: Energy Information Administration, International Energy Agency, BP, Facts Global Energy; A.T. Kearney analysis⁸⁷

However, the size of the area in Vassilikos is only about 2 sq. km. Hence, there are various questions raised by industry sources about the adequacy of the space for a modern-sized export plant of at least three trains of 5 million tons/yr of LNG each in the area.⁸⁸ Besides, there is even a more relevant weakness of the project. Considering the

⁸⁶ FES Cyprus Newsletter, Friedrich Ebert Stiftung, July 2013.

<http://www.fescyprus.org/media/newsletter/en/Cyprus%20Newsletter%20nr13%20en.pdf>

⁸⁷ Projected LNG demand by region through 2020, Energy Information Administration.

⁸⁸ Charles Ellinas, "Development of Cyprus Hydrocarbons and Safety Considerations", CNHC, 24 May 2013.

vitality of what will be substantial state revenues for Israel, their concerns regarding controlling the revenues from exports. In addition, there are potential security risks that might put Cyprus in a situation of higher political tensions with Turkey. Additionally, the military point of view clearly indicates that Israeli generals necessarily perceive the export facility as a matter of Israeli sovereignty.

However, these plans require discovering more fields and a significant shift in Israel's policy on sending its gas for processing to a third country. By the scenario where Vassilikos become an LNG hub in the Eastern Mediterranean region, which takes in gas from Israeli and Lebanese fields, the exports might rise to 50 bcm per year.⁸⁹ Cypriot officials' optimistic predictions indicate that an LNG plant could be exporting 7 bcm by 2020, while exports will reach to 35 bcm by 2025.⁹⁰ The plans to deliver gas to Vassilikos from offshore Lebanon by 2020 are not to be considered viable yet.

Furthermore, in port cities such as Ashdod, Ashkelon and Eilat, there are opposition voices raised against domestic LNG export plans.⁹¹ Hence, a joint plant built in Vassilikos would help Israel to bypass this opposition. In addition, this option would benefit Israel in terms of preferential import with other EU countries, beside EU grants. Cyprus and Israel enjoy a good relationship which should help two sides to agree on a roadmap. Regarding all, this project is the monetization option that seems most likely to be actualized. Nevertheless, the project's commercial viability is dependent upon delivering additional Israeli gas to Vassilikos.⁹²

http://www.cysha.org.cy/gr/News/20130524/Final_CY_HCSafety_cpe.pdf

⁸⁹ Simon Henderson, "Natural Gas Exports For Israel and Cyprus", German Marshall Fund, 2013. <http://www.washingtoninstitute.org/uploads/Documents/opeds/Henderson20130901-NaturalGasExportOptions.pdf>

⁹⁰ *Ibid.*

⁹¹ Yifa Yaakov, "High Court gives green light to gas export", The Times of Israel, 21 October 2013. <http://www.timesofisrael.com/high-court-gives-green-light-to-gas-export/>

⁹² Simon Henderson, "Natural Gas Exports For Israel and Cyprus", German Marshall Fund, 2013.

CONCLUSION

Eastern Mediterranean natural gas discoveries in the offshores of Israel and Cyprus is a new development that needs a further analysis with every new development. This thesis attempted to explore possible answers to the question of how these natural gas discoveries affect the region's geopolitics. Two regional countries, Israel and Cyprus, were the main focus of this study. By focusing on these two countries and examining their possible policy decisions, the thesis tried to explain the effects of natural gas reserves on geopolitics. As Israel has the most natural gas reserves in the region, compared to Cyprus, it was assumed that Israeli policy decisions on how to use natural gas reserves in Leviathan and Tamar fields will be more dramatic and decisive when geopolitics taken into consideration. However, importance of Cypriot natural gas reserves has taken enough attention even if the Israel has most of the gas in the Eastern Mediterranean. Cyprus's history with Turkey, its divided status since 1974 and Cyprus being a European Union member makes Cypriot natural gas discoveries an important factor that affects regional politics.

Some of the natural gas scenarios for Israel and Cyprus discovered in Chapter Two are economically feasible but realization of these scenarios are problematic due to political realities of the region. Nevertheless, even if the political realities or economic feasibility of the scenario look negative, viability of a scenario can still exist if it can be a part of conflict resolution process. Arish-Ashkelon scenario is a cheap option which involves only some mechanical engineering on the pipeline to reverse the flow of natural gas from Israel to Egypt. However, politically this is a hard scenario to implement for both the Israeli and Egyptian politicians due to risk of repercussions on domestic politics on both countries, especially for Egyptian politicians after the Egyptian Revolution.

Peace scenario is not an economically interesting option for Israel but it is a beneficial option to use resolving conflicts with its neighbors. Political realities for Egypt, Lebanon and Palestine, which are examined in the scenario, different between each other. For Israel to use this scenario, it has to have an ad hoc approach to for each country to use natural gas for conflict resolution purposes.

Economic feasibility of Turkey scenario is the most attractive option for Israel among other scenarios listed in Chapter Two but its realization is highly dependent on the change of political behavior in Turkish and Israeli sides. Domestic politics play a key role on scenarios viability.

Scenario that deals with Floating LNG facility does not give us a clear picture whether FLNG facilities are feasible or not due to it being an untested new technological development. Eastern Mediterranean Pipeline Project is an interesting scenario that involves Israel, Cyprus and Greece to build a pipeline and carry Eastern Mediterranean gas to European Union. Politically, other than possible objections and actions by Turkey, there are no obstacles to build such a pipeline but economically it is not a feasible option for Israel to choose. Vassilikos scenario's economic feasibility depends on arrival of additional Israeli gas as LNG facilities themselves would be too costly for Cyprus if it only receives Cypriot gas.

Historical past of Israel and Cyprus with other regional countries affect the options they can choose to export their natural gas. Divided status of Cyprus removes options, which were not discussed in this thesis, which could be the most economically efficient option for Cypriot gas. Turkey disregards any natural gas proposal that would come from Cyprus before the long lasting solution to the island happens. Israel's problematic relationship with Turkey forces it to consider other options and diverge its focus from an economically most reasonable option by building pipelines through Turkey to other options which carry risks for both Israel's economic and security spheres.

This thesis tried to explain geopolitical effects of recent offshore Israeli and Cypriot natural gas discoveries by examining several countries histories, their natural gas capabilities and scenarios that main natural gas actors can implement. All the scenarios carry potential political and economic risks as well as benefits for both the Israel and Cyprus. Israeli policy decisions with regard to natural gas will play a key role for determination of the region's geopolitics as the entire Eastern Mediterranean natural gas story is about Israel because it has majority of the gas reserves in the region that can change geopolitical dynamics.

Bibliography

Ahmed, NafeezMosaddeq. (01/11/2012). Israel's War for Gaza's Gas. *Le Monde Diplomatique*, <http://mondediplo.com/blogs/israel-s-war-for-gaza-s-gas> Date of access: December 03, 2013

Al Jazeera. (18/11/2008). Egypt court freezes Israel gas deal. <http://www.aljazeera.com/news/middleeast/2008/11/2008111895917929279.html> Date of access: December 03, 2013

Al-Youm, Al-Masry. (19/12/2012). Egypt officially becomes gas-importing country to meet demand. *Egypt Independent*. <http://www.egyptindependent.com/news/egypt-officially-becomes-gas-importing-country-meet-demand> Date of access: December 30, 2013

Arbell, Dan. (1/11/2013) Turbulence in Turkey–Israel Relations Raises Doubts Over Reconciliation Process. *Brookings*. <http://www.brookings.edu/blogs/up-front/posts/2013/11/01-turkey-israel-reconciliation-arbell> Date of access: December 03, 2013

Amurthy, R. Sury. (20/02/2011) Shale lures ONGC to quit block, *The Telegraph India*. http://www.telegraphindia.com/1110221/jsp/business/story_13611726.jsp Date of access: November 15, 2013

Ayat, Karen. (08/11/2013). Cyprus and Total Sign MOU To Build Vassilikos LNG Facility. *Natural Gas Europe*. <http://www.naturalgaseurope.com/cyprus-total-sign-mou-vassilikos-lng-facility> Date of access: December 22, 2013

Barkat, Amiram. (13/03/2013). Israel in secret talks with BG on Palestinian gas. *Globes*. <http://www.globes.co.il/serveen/globes/docview.asp?did=1000829662&fid=1725> Date of access: December 23, 2013

Bennhold, Katrin. (29/01/2009). Leaders of Turkey and Israel Clash at Davos Panel. *The New York Times*. http://www.nytimes.com/2009/01/30/world/europe/30clash.html?_r=1& Date of access: November 14, 2013

Bryza, Matthew J. (08/2013). An Israel–Turkey Natural Gas Pipeline: inter-connection of commercial and geopolitical logic. *Oxford Energy* *Forum*. <https://www.oxfordenergy.org/2013/10/issue-93-august-2013/> Date of Access: November 12, 2013

Dbouk, Yahya “*Israel Accuses Lebanon of Stealing Its Gas and Oil*”, Al-Akhbar English, 3 October 2013. <http://english.al-akhbar.com/node/17222> Date of a

Delek Group. *Holdings, Energy and Infrastructure*. <http://www.delek-group.com/Holdings/EnergyInfrastructure/DelekEnergy.aspx> Date of access: November 12, 2013

- Deloitte. *EGAS launches international oil and gas Bid Round 2012*.
http://www.psg.deloitte.com/NewsLicensingRounds_EG_120607.asp Date of access:
 December 13, 2013
- Deloitte. *Egyptian General Petroleum Company launches International Bid Round 2011*.
http://www.psg.deloitte.com/NewsLicensingRounds_EG_110927.asp Date of access:
 December 10, 2013
- Ellinas, Charles. (24/05/2013). *Development of Cyprus Hydrocarbons and Safety Considerations*. *CNHC*.
http://www.cysha.org.cy/gr/News/20130524/Final_CY_HCSafety_cpe.pdf Date of
 access: December 12, 2013
- Eldar, Shlomi. (12/09/2013). *Israel's Miscalculation on Egyptian Natural Gas*. *Al-Monitor*.
<http://www.al-monitor.com/pulse/originals/2013/09/israel-ariel-sharon-palestinians-egyptian-natural-gas.html> Date of access: November 24, 2013
- European Investment Bank. (08/03/2012). *Cyprus: Vital EIB Support of EUR 130 million for energy production*.
<http://www.eib.org/projects/press/2012/2012-035-cyprus-vital-eib-support-of-eur-130-million-for-energy-production.htm> Date of access:
 December 26, 2013
- Friedrich Ebert Stiftung. (07/2013). *FES Cyprus Newsletter*.
<http://www.fescyprus.org/media/newsletter/en/Cyprus%20Newsletter%20nr13%20en.pdf> Date of Access: November 30, 2013
- Gardosh, Michael; Yehezkel Druckman, Binyamin Buchbinder and Michael Rybakov, *"The Levant Basin Offshore Israel: Stratigraphy, Structure, Tectonic Evolution and Implications for Hydrocarbon Exploration"*, 21 April 2008. Date of Access: November 12, 2013
- "Gas Finds Complicate Eastern Mediterranean Security"*, International Relations and Security Network, 26 June 2013.
<http://isn.ethz.ch/Digital-Library/Articles/Detail/?lng=en&id=165423> Date of Access:
 November 12, 2013
- "Greece, Cyprus Push for East Med Pipeline Amidst Difficulties"*, Natural Gas Europe, 29 November 2013.
<http://www.naturalgaseurope.com/greece-cyprus-east-med-pipeline> Date of Access:
 December 22, 2013
- Gürel, Ayla; Mullen, Fiona and Tzimitras, Harry *"Cyprus Hydrocarbons Issue: Context, Positions and Future Scenarios"*, Prio Report, 2013.
http://www.prio.no/Global/upload/Cyprus/Publications/Hydrocarbons_Report-ENG.pdf
 Date of Access: November 12, 2013
- Henderson, Simon *"Natural Gas Exports For Israel and Cyprus"*, German Marshall Fund, 2013.
<http://www.washingtoninstitute.org/uploads/Documents/opeds/Henderson20130901-NaturalGasExportOptions.pdf> Date of Access: November 12, 2013

Haaretz “*Hezbollah: Lebanon will not let Israel seize its natural gas*”, 14 July 2011.
<http://www.haaretz.com/news/diplomacy-defense/hezbollah-lebanon-will-not-let-israel-seize-its-natural-gas-1.373201> Date of Access: November 02, 2013

Hwa-Chiu, Chen “*Commercial And Technical Considerations In The Developments In The Offshore Liquefaction Plant*”, 23rd World Gas Conference Amsterdam, 2006.
<http://www.igu.org/html/wgc2006/pdf/paper/add11306.pdf> Date of Access: November 02, 2013

Khan, Gabe “*Egyptian Gas Stoppage to Cost Israel \$1.5m Per Day*”, ArutzSheva, 28 April 2011. <http://www.israelnationalnews.com/News/News.aspx/143760#.Us3fprTJa4k> Date of Access: November 22, 2013

Keinon, Herb “*Israel irritated at UN for nodding at Lebanese gas claims*”, The Jerusalem Post, 1 December 2011.
<http://www.jpost.com/National-News/Israel-irritated-at-UN-for-nodding-at-Lebanese-gas-claims> Date of Access: December 02, 2013

Koehler, Michael “*Gas Discoveries in the Eastern Mediterranean: Implications for the European Union*”, German Marshall Fund, 2012.
http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1351282654Koehler_GasDiscoveriesEU_Oct12.pdf
December 22, 2013

Leigh, Michael “*Preliminary Reports and Recommendations on Energy Resources in the Eastern Mediterranean: Source for Cooperation or Fuel for Tension*”, German Marshall Fund, 2012
http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339170753Leigh_SummaryDocument_Jun12_maps.pdf
Date of Access: December 02, 2013

Leigh, Michael Charlotte Brandsma, “*Energy Resources In The Eastern Mediterranean: Source For Cooperation Or Fuel For Tension*”, Brussels Forum, 2012.
http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/leigh_brandsma_easternmedenergy_bf12.pdf Date of Access: November 02, 2013

List of Projects of Common Interest, European Commission, 20 November 2013.
http://ec.europa.eu/energy/infrastructure/pci/doc/2013_pci_projects_country.pdf Date of Access: December 02, 2013

Mankoff, Jeffrey “*Resource Rivalry in the Eastern Mediterranean: The View from Washington*”, German Marshall Fund, 2012.
http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339093526Mankoff_ResourceRivalry_Jun12.pdf Date of Access: December 30, 2013

Manolis, Dimitris and Elsa Loverdos, “*The East Med Pipeline*”, Oxford Energy Forum, Issue 93, August 2013. Date of Access: December 30, 2013

Marroushi, Nadine “*Egypt: natural gas in abundance but every day brings power cuts*”, Financial Times, 18 December 2013.

<http://www.ft.com/intl/cms/s/0/5aabd292-52c1-11e3-8586-00144feabdc0.html#axzz2pqOT0tiZ> Date of Access: December 30, 2013

Ministry of Energy and Water Resources, Petroleum and Natural Gas Prospecting.
<http://energy.gov.il/English/Subjects/OilAndGasExploration/Pages/GxmsMniPetroleumAndNaturalGasProspecting.aspx> Date of Access: December 20, 2013

Ministry of Energy, Cyprus, Hydrocarbon Exploration, 2012.
http://www.mcit.gov.cy/mcit/mcit.nsf/dmlhexploration_en/dmlhexploration_en?OpenDocument Date of Access: December 20, 2013

Noble Energy, Operations, Eastern Mediterranean.
<http://www.nobleenergyinc.com/Exploration/Recent-Discoveries-130.html> Date of Access: December 14, 2013

“*Noble Energy Announces Appraisal Drilling And Flow Test Results Offshore Republic Of Cyprus*”, 3 October 2013.

<http://investors.nobleenergyinc.com/releasedetail.cfm?ReleaseID=794694> Date of Access: December 14, 2013

Confidence and security building, OSCE.
<http://www.osce.org/fsc/44569> Date of Access: December 24, 2013

Onoufriou, Toula “*Cyprus – a Future Energy Hub?*”, German Marshall Fund Of The United States, 2012.
http://www.gmfus.org/wp-content/blogs.dir/1/files/mf/1349894204Onoufriou_CyprusEnergy_Oct12.pdf Date of Access: December 16, 2013

Oxford Energy Forum, Issue 93, Ed. Bassam Fatouh
<http://www.oxfordenergy.org/wpcms/wp-content/uploads/2013/10/OEF-93.pdf> Date of Access: December 16, 2013

Öğütçü, Mehmet. (06/2012). RivalryInTheEasternMediterranean: TheTurkishDimension. *German Marshall Fund Of The United States*.
http://www.gmfus.org/wp-content/blogs.dir/1/files/mf/1339171647Ogutcu_EasternMedRivalry_Jun12.pdf Date of access: October 24, 2013

Özerli, Busra. (28/07/2013). Economic ties grow despite political fluctuations between Israel, Turkey. *Today's Zaman*.<http://www.todayszaman.com/news-321902-economic-ties-grow-despite-political-fluctuations-between-israel-turkey.html> Date of access: November 21

Pfeffer, Anshel. (25/09/2011). Turkey to deploy warships over gas dispute with Cyprus. *Haaretz*. <http://www.haaretz.com/news/diplomacy-defense/turkey-to-deploy-warships-over-gas-dispute-with-cyprus-1.386659> Date of Access: November 14

Oil & Gas Journal. (07/12/2007). PTT buys 25% of East Mediterranean Gas Co. <http://www.ogj.com/articles/2007/12/ptt-buys-25-of-east-mediterranean-gas-co.html> Date of Access: December 20

Reuters. (06/07/2013). Blast hits gas pipeline between Egypt, Jordan.<http://www.reuters.com/article/2013/07/07/us-egypt-protests-pipeline-idUSBRE96601I20130707> Date of access: December 12

Sanders, Edmund.(23/04/2012). Egypt-Israel natural gas deal revoked for economic reasons. *Los Angeles Times*. <http://articles.latimes.com/2012/apr/23/world/la-fg-egypt-israel-oil-20120424> Date of access: November 1, 2013

Sanger-Weaver, Jodi. (24/01/2012). Egypt- Israel, And The Arish-Ashkelon Pipeline Controversy. *Prospect*. <http://prospectjournal.org/2012/01/24/egypt-israel-and-the-arish-ashkelon-pipeline-controversy/> Date of access: November 6, 2013

Shell. Website. *A revolution in natural gas production*.<http://www.shell.com/global/aboutshell/major-projects-2/prelude-flng/revolution-natural-gas-production.html> Date of access: November 6, 2013

Shirkhani, Nassir. (10/03/2008). Egyptian gas flows to Israel. *Upstream*. <http://www.upstreamonline.com/live/article1153755.ece> Date of access: November 16, 2013

Schmid, Dorothee.(03/2013). Towards an Energy Revolution in the Eastern Mediterranean: Any Positive Effect for the EU?. *Center For International and European Studies*.[http://www.khas.edu.tr/cms/cies/dosyalar/files/NeighbourhoodPolicyPaper\(12\).pdf](http://www.khas.edu.tr/cms/cies/dosyalar/files/NeighbourhoodPolicyPaper(12).pdf) Date of access: November 6, 2013

Scovazzi, Tullio. (06/2012). Maritime Boundaries In The Eastern Mediterranean Sea. *German Marshall Fund Of The United States*.http://www.gmfus.org/wp-content/blogs.dir/1/files_mf/1339504227Scovazzi_MaritimeBoundaries_Jun12.pdf Date of access: December 14

Sherwood, Harriet. (22/03/2013). Netanyahu apologises to Turkish PM for Israeli role in Gaza flotilla raid. *The Guardian*. <http://www.theguardian.com/world/2013/mar/22/israel-apologises-turkey-gaza-flotilla-deaths>. Date of access: November 26, 2013

Solovieva, Daria. (2013). Why Is Egypt Importing Natural Gas?. *Egypt Oil & Gas*.http://www.egyptoil-gas.com/read_article_issues.php?AID=623 Date of access: December 12

Stratfor. (19/08/2011). Egypt's Dilemma After Israel Attacks. *Business Insider*.
<http://www.businessinsider.com/egypts-hamas-dilemma-after-attacks-in-israel-2011-8>
Date of access: November 1, 2013

Tagliapietra, Simone. (12/ 2013). Towards A New Eastern Mediterranean Energy Corridor? Natural Gas Developments Between Market Opportunities And Geopolitical Risks. FondazioneEni Enrico Mattei.
<http://www.feem.it/userfiles/attach/2013215105594NDL2013-012.pdf> Date of Access:
December 30, 2013

The Global Herald. (15/11/2010). *Australia: Shell Prelude LNG Project gets Federal Approval*.
<http://theglobalherald.com/australia-shell-prelude-lng-project-gets-federal-approval/7000/> Date of access: December 30, 2013

U.S. Geological Survey.(03/ 2010). *World Petroleum Resources Project, Assessment of Undiscovered Oil and Gas Resources of the Levant Basin Province, Eastern Mediterranean, Fact Sheet 2010–2014*. Date of Access:December 30, 2013

World Bank. *Population growth (annual %)*.
<http://data.worldbank.org/indicator/SP.POP.GROW> Date of access: December 3, 2013

Yaakov, Yifa. (21/10/2013). High Court gives green light to gas export. *The Times of Israel*.
<http://www.timesofisrael.com/high-court-gives-green-light-to-gas-export/> Date of Access:December 30, 2013