



## **Master Thesis**

# **Energy Security Threats: A Comparative Geopolitical Assessment in the Southeast Mediterranean**

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## **Abstract**

Energy sector is a very crucial sector for a country as it drives economic development, specific policies and diplomatic moves and it is constantly drawing attention. This thesis is a study of energy security and energy threats of the countries of the Eastern Mediterranean, by analyzing factors related to policy, diplomacy, geopolitics, economics and total energy supply. The thesis begins with the state of the art of the literature review of the concept of energy security, and more specifically the definitions of the energy security, its dimensions and its threats are presented. Since there is no global agreement among the academics on a specific definition of energy security, it would be more important to focus on the dimensions of the energy security, because these include many different aspect of this issue. Following the literature review, the countries of the region are presented, which are Greece, Cyprus, Turkey, Lebanon, Israel, Egypt and Libya, with the focus on their energy mix, which proves the importer status of the countries, since these countries depend on energy imports to cover their domestic demand. Moreover, the latest developments in energy, such as the gas discoveries or the possibility of constructing the EastMed pipeline create a new landscape in the region. These give an increasing interest, because of the geopolitical importance of the region. However, there are threats posed to energy security of the countries under study, mainly of political, diplomatic, economic and technical nature.

**Keywords:** Energy security, energy threats, energy dimensions, geopolitics, Eastern Mediterranean

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# Chapter 1: Introduction

## *1.1 Introduction*

Energy is the most important industry of a country, as it can be the most crucial and the most important for its sovereignty and its growth, Litsas & Tziampiris note.<sup>1</sup> Globally, many countries rely on their natural resources for their economic growth and their prosperity and there are many countries that use energy as a weapon for their interests. To this purpose, the energy industry holds an important part of a state's foreign policy and it often drives and dictates the national interests.

Taking that into account, policy makers put this sector on top of their agenda and as a result they try to protect it from any threat either internal or external, as noted by Stampolis.<sup>2</sup> Threats to energy industry seem to pose a dangerous problem for national sovereignty and national security and they must be seriously taken into account. For this reason, security is on the epicenter of national strategy to protect national interests. There can be no prosperity and growth for a state if it does not reach a certain level of security.

The region of the Eastern Mediterranean is a part of the world, where many different countries and civilizations are located, as it is the crossroad of three continents and it is very important for the trade and the security of these continents, as noted by Tsakiris.<sup>3</sup> Furthermore, it is a region where extensive tensions take place historically. Moreover, the recent energy discoveries and developments of the previous years have given a growing interest of the region. Discoveries in the EEZ of Cyprus and Israel and Lebanon and experiments in the EEZ of Greece create a new game in the Eastern Mediterranean.

While some of the countries do find cooperation via diplomacy and see the energy landscape as a perfect ground for cooperation and prosperity, there are others in the region which create tensions and threat national sovereignty.

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<sup>1</sup> Litsas & Tziampiris (2015).

<sup>2</sup> Stampolis (2019).

<sup>3</sup> Tsakiris (2021).

This region is very crucial for the supply of Europe as well, that is the reason why European countries do show their interest in the area. Furthermore, there are a lot of threats to the energy security of the region that need to be taken into account for countries' strategy.

## ***1.2 Scope of the study & structure***

This postgraduate thesis investigates energy security threats of the Eastern Mediterranean. A key aspect of this thesis is to present a comparative geopolitical assessment in the region. Whether a country/region has energy security threats is determined by the interplay across many factors. This thesis, analyzing these factors, reviews the main threats to energy security in order to determine their impact on Eastern Mediterranean countries.

The second chapter of this thesis is a literature review of the concept of energy security and the threats that may occur as well. The third chapter describes the methodology that will be followed and contains the research questions which will be researched and answered. In the fourth chapter the countries of the region are presented with their energy mix and the geopolitical aspects of the Eastern Mediterranean. Finally, the thesis analyses the Eastern Mediterranean countries at policy and energy industry along with a comparative analysis in order to present possible threats.

## **Chapter 2: Literature review**

### ***2.1 Definitions of energy security***

To begin with and get a broader view of this specific topic it is crucial to mention certain definitions, which will make the reader more familiar with the energy issues.

In order to define energy security, some authors have been occupied with this definition, however it was not possible to reach an agreement and a common definition and as a result there is no worldwide acceptance for this. As stated by Paravantis et al., countries across the globe decide to define energy security according to their own needs, their own situation or even their own vulnerability.<sup>1</sup> One may find too many definitions, which differ from one another, however there are some which more adequately reflect the topic.

Yergin, who was one of the first authors to introduce this specific definition, stated that the key aspect of energy security was the adequate, reliable supplies of energy at reasonable prices. He also added a severe geopolitical aspect stating that these supplies should not jeopardize national values or objectives, because they are considered as key elements as far as the energy sector is concerned.<sup>2</sup>

More recently it was the International Energy Agency that gave an accepted definition, which included an economic perspective as well. According to IEA energy security could be the uninterrupted availability of energy sources at an affordable price. Moreover, IEA gave a new aspect of energy security by dividing into long-term and short-term. Short-term is about the capacity of an energy system to adequately react to sudden changes regarding the supply and demand balance. On the other hand, long-term reflects the economic developments and the environmental needs, stating that energy investments should be in line with these two aspects.<sup>3</sup>

A broader and expanded definition comes from the Asia Pacific Energy Research Center (2007), which includes four “A” in its meaning. These “A” stand for availability, affordability, accessibility and acceptability. According to it, energy security should be

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<sup>1</sup> Paravantis et al. (2019).

<sup>2</sup> Yergin (1988).

<sup>3</sup> International Energy Agency (IEA) (2011).



considered as *“the ability of an economy to guarantee the availability of the supply of energy resources in a sustainable and timely manner with the energy price being at a level that will not adversely affect the economic performance of an economy”*.<sup>1</sup>

Cherp and Jewell go beyond this definition and point out three key questions. “Security for whom?”, “security for which values?” and “security from what threats?” They state that energy security is underpinned by energy systems’ vulnerability, which is the combination of exposure to risk and the resilience of the system.<sup>2</sup>

## ***2.2 Dimensions of energy security***

Many studies have been conducted in order to decode the different dimensions of the energy security. Since there is no global agreement on the specific definition of this topic, authors have given multiple dimensions of energy security, while trying to analyze it. Dimensions aim to make energy security more comprehensive and understandable so that it could be used in any context.

A study by the American Chamber of Commerce gave the geopolitical, economic, reliability and environmental dimensions. The geopolitical dimension refers to the energy imports, the economic refers to the energy intensity, and the reliability includes the capacity of the infrastructure, while the environmental dimension refers to the carbon intensity.<sup>3</sup>

Furthermore, similar typology was given by another international institution, the International Energy Agency, which included the capacity of the power system, the geopolitical component, the import dependence and the market performance.<sup>4</sup>

In their study for the dimensions of energy security, Brown et al., point out the availability as the most important factor, which is the necessary diversification of energy resources as well as the location of the energy facilities for these resources. Affordability is also mentioned, which includes both affordable prices for the consumers and minimizing price

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<sup>1</sup> Asia Pacific Energy Research Center (2007).

<sup>2</sup> Cherp & Jewell (2013).

<sup>3</sup> U.S. Chamber of Commerce (2010).

<sup>4</sup> International Energy Agency (IEA) (2011).

volatility. Efficiency is another dimension, which refers to the performance of respective energy infrastructure, and finally the environmental and social stewardship, which is the protection of the environment for the future generations.<sup>1</sup>

In another paper by Sovacool and Mukherjee, three more dimensions were added to the previously mentioned affordability and availability. These were the technology development, referring to research and development activities, the sustainability and the regulation, which also included the governance, the competition and the trade of energy.<sup>2</sup>

Moreover, on their paper, Azzuni and Breyer, emphasize on the location as a crucial aspect. This dimension deals with the spatial features of the energy system and its relation to energy security.<sup>3</sup> The term 'location' refers to the location of the energy sources, to the boundaries of the energy infrastructure, to its density, because centralized systems are enemy targets and thus reduce energy security, and to globalization, as regional and international interconnection will enhance energy security. They also include the time frame in their work, which is related to a country's aspect about the energy security and especially whether energy security is regarded as a short-term or long-term issue to be addressed. Furthermore, resilience of the system is regarded as a very important dimension as well, which is the ability to overcome disruptions without a change in the energy security baseline. "*A resilient system can switch between different energy suppliers, different energy transition pathways and energy carriers, and different consumers*" as stated by Martisauskas et al.<sup>4</sup> The resilience is in strong correlation with the next dimension. Azzuni and Breyer make a specific reference to the diversity of a country's or a region's energy system. Systems which are more diverse tend to be more secure as well. This means that in case of a failure of one part of the system, there will be other alternative solutions which could help the system's functionality. They also stress out the cultural dimension of energy security, as they conclude that culture affects the way people think and react about some specific issues. An addition to the political dimension was done, as they talk about the

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<sup>1</sup> Brown et al. (2011).

<sup>2</sup>Sovacool & Mukherjee (2011).

<sup>3</sup>Azzuni & Breyer (2018).

<sup>4</sup>Martisauskas, Augutis & Krikstolaitis (2018).

strong correlation between politics and energy security and about the political interests that affect the action for energy security.

However, a very crucial dimension cited in Azzuni and Breyer is the cybersecurity. As the world is approaching the post pandemic period, there will be need for more decentralized activities and the connectivity of the energy system is always controlled by digital programs. All energy infrastructures rely on digital activities, consequently the digital dimension is important for energy security. Computers and digital programs control the whole energy system (production, connections, and consumption).

In Brown & Huntington and Sovacool & Saunders the dimension of the environmental sustainability is presented.<sup>1</sup> This dimension includes different aspects, such as land use, water pollution or the climate change and it represents the environmental aspects of the energy production, transport and consumption.<sup>2</sup>

Finally, Von Hippel et al. present the militarization of energy security, which is the use of energy security or energy sources for military purposes, or the use of energy as a mean in a military conflict to achieve political objectives.<sup>3</sup>

Table 1 lists the dimensions of the energy security.

*Table 1. Dimensions of energy security*

<b>Source</b>	<b>Dimension</b>	<b>Explanation</b>
American Chamber of Commerce, 2010. International Energy Agency, 2011	<ul style="list-style-type: none"> <li>• Geopolitical</li> <li>• Economic</li> <li>• Reliability</li> <li>• Environmental</li> </ul>	Dependence on energy imports is a crucial dimension of energy security as it shows the independence of a country. The more dependent a country is, the more vulnerable it becomes.

<sup>1</sup>Brown & Huntington (2010).

<sup>2</sup>Sovacool & Saunders (2014).

<sup>3</sup>Von Hippel et al. (2011).

		<p>The capacity of infrastructure is also crucial as it ensures the uninterrupted supply making the country more resilient</p> <p>Carbon intensity is used to derive estimates of greenhouse gas emissions, the less pollutant a country is, the better it is for its own energy security</p>
<p>Azzuni and Breyer, 2017</p>	<ul style="list-style-type: none"> <li>• Location</li> <li>• Time frame</li> <li>• Resilience of the system</li> <li>• Diversity</li> <li>• Culture</li> <li>• Cybersecurity</li> </ul>	<p>Location of energy sources plays an important role for the energy supply of a country; countries with resources are rich, others close to sources cover their demand easily, while others face serious supply issues</p> <p>Time frame proves that energy security issues should be addressed both on near future and on long term</p> <p>The resilience of the system shows the ability of a country's system to overcome external disruptions, while systems which are more diverse tend to be more secure as well</p> <p>Alternative solutions to are important to cover domestic demand, as they reduce the dependence of a country on its suppliers</p>

		Energy digital infrastructure must not be vulnerable to cyber attacks
Brown et al., 2011	<ul style="list-style-type: none"> <li>• Availability</li> <li>• Affordability</li> <li>• Efficiency</li> <li>• Environmental and social stewardship</li> </ul>	<p>Diversification of energy resources and the location of energy facilities prove the availability of energy products for a country</p> <p>Affordable energy prices and minimizing price volatility are needed to improve energy security, because the higher the prices, the less secure a country is</p> <p>Protection of the environment for future generations will improve future energy security</p>
Brown & Huntington, 2010. Sovacool & Saunders, 2014	<ul style="list-style-type: none"> <li>• Environmental Sustainability</li> </ul>	Includes land use, water pollution, climate change, environmental aspects of energy production, transport and consumption
Sovacool and Mukherjee, 2011	<ul style="list-style-type: none"> <li>• Technology development</li> <li>• Sustainability</li> <li>• Regulation</li> </ul>	Technology refers to R&D activities in the energy sector, while regulation refers to governance and competition
Von Hippel et al., 2011	<ul style="list-style-type: none"> <li>• Militarization</li> </ul>	Use of energy security or energy sources for military purposes, or the use of energy as a means in a military conflict to achieve political objectives

Source: Edited by the author

### ***2.3 Threats to energy security***

There are many forms of threats that may appear to energy security, which could have a significant impact either on several issues like the supply of energy, or business activities or the price of energy itself.

These exact threats could be either long-term or immediate and their origin can be everywhere in the world; it does not mean that a threat comes from a specific country and only affects that country. For example, the Russian disputes with its neighboring countries did have an impact on the supply and the prices of the European energy market and the European consumers as well.

Some authors and researchers have been occupied with this specific issue and have tried to decode certain aspects, with the enlisting of possible threats to the energy security.

Watson stated four major categories of the possible threats for the energy security, which he later explained with regards to the British energy industry. In his paper, he emphasizes on the fossil fuels depletion and the external disruptions, which means that there may be potential threats due to fossil fuel scarcity or disruptions to fossil fuel supplies from international markets. This is in correlation with the high concentration of fossil fuels reserves in the Middle East and Russia. Secondly, he discusses about the underinvestments in the energy infrastructure. A country's or a region's security could be severely threatened by the lack of investments in national energy infrastructures, which means that both the countries' and the consumers' access to energy is limited in case of disruptive events. Furthermore, he states that technology and infrastructure failures are always into play, such as extreme weather conditions that could affect the system. For example extreme heat in France during the summer 2003 lead to nuclear plants' underperformance or the hurricane Katrina on offshore oil and gas facilities in the Gulf of Mexico. Finally, he talks about the deliberate disruption, including terrorist attacks, protests or strikes.<sup>1</sup>

There is the study by Azzuni and Breyer, who wanted to give their insights about energy security and its threats. They state some dimensions of energy security and the possible threat to it. Firstly, they discuss about the limited availability saying that the biggest

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<sup>1</sup> Watson (2010).

problem is the concentration of energy resources in a dramatically low number of countries. This creates severe independence of some countries which cannot perform their own production. Secondly, they point out the economic threats of this topic, there are many external and unpredictable factors that cause an increase in energy prices affecting the most vulnerable and the poorest countries. Price volatility and investment risks are threats to energy security because rapid changes in energy prices can disrupt the economy and destabilize financial structures.

Moreover, they underline the sociocultural threat to the energy industry. More specifically, they are showing a psychological effect as a result of people's misleading by the media, which result in false perceptions about the topic.

Another key aspect is the political environment as the lobbying and the interests of some groups pose a major threat; this means that certain policies may be in favor of some specific groups and their interests, rather than trying to tackle major energy problems to enhance efficiency.

They stress out the need for correct time frame, wrong analysis of the system due to wrong time frame use is the biggest threat. This is in accordance with the short-term and long-term efforts to deal with this threat. Short-term efforts include the need for emergency measures such as coordination of energy stocks, while in the long-term there is need for policies to diversify the energy system, to enhance flexibility, and to increase energy efficiency.<sup>1</sup>

There are also many studies, Sovacool & Brown and Sovacool, which prove the inefficiency of the energy systems, which include the underperformance of the energy equipment and the inability of a country to change consumers' behavior and perspective of the energy use.<sup>23</sup>

Attention should be paid to the environmental threats as well, as described by Du et al., Von Hippel et al. The environmental dimension of the energy security has threats which

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<sup>1</sup> Azzuni & Breyer (2018).

<sup>2</sup>Sovacool & Brown (2010).

<sup>3</sup>Sovacool (2012).

are related to the environmental output of the energy use, such as the carbon dioxide and greenhouse gas emissions, global warming, climate change, heavy-metal emissions, water contamination, acidic rain, air pollution.

Von Hippel et al. talk about the militarization dimension of energy security, and consequently the threats derived from it is the real need for protection of critical infrastructures by the military forces, because there is the threat of terrorist attacks. However the use of military is always tremendous, expensive, and causes a lot of visible and invisible casualties on the economy and the environment.<sup>1</sup>

Johnston in his work records many possible threats to energy security. Firstly, he talks about the nationalization of energy infrastructure. That means the taking over of the operations of international energy companies either by local national state-owned energy companies or by exploiting previously underdeveloped resources.<sup>2</sup>

He points out the terrorism as a threat with big impact on the energy landscape. Terrorist attacks do often take place on oil extraction and transportation activities or facilities. Vulnerabilities include pipelines, refining and storage facilities, shipping chokepoints, and loading facilities. As the energy markets in the world are integrated, energy infrastructure crosses any border and as a result terrorism acts have a big impact on many countries.

Piracy is also considered a potential threat to energy security. Johnston reports a steady increase in piracy incidents worldwide, while half of all of them do occur in the shores of Somalia or in the Indian Ocean, where Somali pirates act. The International Maritime Bureau reports the places where the most attacks take place and these include offshore Nigeria, Bangladesh, offshore Vietnam, Malaysia, Indonesia, Peru and Brazil. There were also incidents in the Malacca Strait and in the Singapore Strait.<sup>3</sup> The impact of pirate attacks may cause disruptions to the supply chain activities, which will later cause an increase in prices or even a shortage in some areas. Furthermore, the costs for the companies to free

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<sup>1</sup>Von Hippel et al. (2011).

<sup>2</sup>Johnston (2011).

<sup>3</sup>ICC International Maritime Bureau (2011).



the vessels from the pirates are transferred to the consumers directly by the increase in the prices.

Conflicts occur in many producing countries and as a result they pose problems on the security of supply. This conflict may occur in countries that produce or are transit countries, which means the whole system is threatened. There have been many examples of this type of threat. The most obvious is the conflict in Iraq, which led in a reduced global energy supply. Furthermore, the Russian invasion in Georgia in 2008 had also many impacts on energy supply, because there were attacks on two pipelines in the region that both transfer oil to European countries, as stated by German.<sup>1</sup>

Natural disasters such as earthquakes or hurricanes may also have negative impacts on the energy landscape. For example, the extreme weather conditions on Mexico that damaged and destroyed significant oil and gas infrastructure created major fuel supply challenges in the United States. Another example are the destruction of electricity infrastructure by tsunamis or earthquakes in Japan in 2011.

Finally, in a report by Bailey, Maruyama and Wallace for McKinsey, there is an analysis of cyber threats for the energy sector. *“The electric-power and gas sector’s unique interdependencies between physical and cyber infrastructure make companies vulnerable to exploitation, including billing fraud with wireless “smart meters,” the commandeering of operational-technology (OT) systems to stop multiple wind turbines, and even physical destruction”* as stated by the authors.<sup>2</sup>

Table 2 shows the literature and the threats with a brief explanation.

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<sup>1</sup>German (2009).

<sup>2</sup> Bailey, Maruyama & Wallace (2020).

Table 2. Threats to energy security

Source	Threats	Explanation
Azzuni & Breyer, 2020	<ul style="list-style-type: none"> <li>• Limited Availability</li> <li>• Economic Threats</li> <li>• Price Volatility</li> <li>• Sociocultural</li> <li>• Political Environment</li> <li>• Time frame</li> </ul>	<p>Concentration of resources in a small number of countries is a threat for other countries as it gives real power to producing countries. This in combination with external factors always affect energy prices resulting in sudden increase, thus posing a serious threat to non-producing countries. On the other hand, certain political interests favor certain energy policies.</p>
Bailey et al., 2020	<ul style="list-style-type: none"> <li>• Cyber Threats</li> </ul>	<p>Companies' cyber infrastructure is often target of enemies, affecting their performance</p>
German, 2009	<ul style="list-style-type: none"> <li>• Conflicts</li> <li>• Natural Disasters</li> </ul>	<p>Conflicts between countries pose threats to security of supply, while natural disasters could be a serious problem for the energy infrastructure</p>
International Maritime Bureau, 2011	<ul style="list-style-type: none"> <li>• Piracy</li> </ul>	<p>Pirate attacks pose threats on the supply chain, which may also have negative impact on prices</p>
Johnston, 2011	<ul style="list-style-type: none"> <li>• Nationalization</li> <li>• Terrorism</li> <li>• Piracy</li> </ul>	<p>Fear of taking over of international energy companies by national governments pose threats to energy business. However, this mainly</p>

		occurs in non-democratic regimes. Terrorist attacks and piracy on oil extraction and transportation activities or facilities threaten the resilience of the system and the energy supply
Sovaccol, 2012 Sovaccol & Brown, 2010	<ul style="list-style-type: none"> <li>• Inefficiency of the energy systems</li> </ul>	The underperformance of the energy equipment and the inability of a country to change consumers' behavior and perspective of the energy use
Von Hippel et al., 2012	<ul style="list-style-type: none"> <li>• Environmental threats</li> <li>• Militarization</li> </ul>	There are threats which are related to the environmental output of the energy use, such as the carbon dioxide and greenhouse gas emissions, global warming, climate change, heavy-metal emissions, water contamination, acidic rain, air pollution. The use of military, is always tremendous, expensive, and causes a lot of visible and invisible casualties on the economy and the environment
Watson, 2010	<ul style="list-style-type: none"> <li>• Fossil fuels depletion</li> <li>• Underinvestments</li> <li>• Technology and infrastructure failures</li> <li>• Deliberate disruption</li> </ul>	Underinvestments are mentioned because of the absence of adequate infrastructure. On the other hand, there is always the danger of facing failures due to the inability of the system to perform properly

Source: Edited by the author

## **Chapter 3: Methodology and research questions**

### ***3.1 Methodology***

Relevant research on energy security and energy threats can be done by approaching a qualitative or a quantitative method. The quantitative method may include analyses of data, statistics, and any other numerical information an author may choose to use. On the other hand, the qualitative method may include theory and geopolitical considerations as well as the energy mix of any country an author wants to include in his/her research. For the purpose of this thesis, a combination of these two methods will be used, with a primary focus on the qualitative method due to the nature of the subject of this thesis. The quantitative method will be used mainly for the presentation and analysis of energy facts of the countries studied in this thesis, facts for the countries of the Eastern Mediterranean, which are taken from the CIA World Factbook and the International Energy Agency

### ***3.2 Research questions***

A researcher or a scholar on the field of geopolitics and energy should try to pursue a research and answers on some crucial questions, which could be regarded as follows.

*Literature Review.* What is the state of the art? What are the definitions given to energy security? How can energy dimensions be defined? What are the threats to the energy security?

*Countries.* Which countries should be included to the research? What is their economic status? Moreover, as far as the energy is concerned, are they producing or importing countries? What is their dependence on energy imports from other countries?

*Energy Mix.* What is the energy mix of these countries? Which is their primary source? Which energy do they produce?

*Location.* Which part of the world will the research focus on? Which countries are located there? What is the importance of this location? Which are the latest energy developments in that area? Which are the threats to the energy sector posed in that specific area?

*Cases.* This should include some specific issues or a comparative analysis of the countries included in the research.

## **Chapter 4: Presentation, analyses and results**

### ***4.1 Countries***

#### *Greece*

To begin with, it is crucial that the countries' profiles are presented in order to provide a broader picture and for this purpose, data from the CIA World Factbook are gathered for the countries, while the energy statistics are gathered from International Energy Agency.

First, Greece is in Southern Europe, bordering the Aegean Sea, Ionian Sea, and the Mediterranean Sea, between Albania and Turkey, and North Macedonia and Bulgaria in the mainland. Greece has a market economy and its public sector accounts for 40% of total GDP of the country, which is 189 billion USD. The tourism industry has the leading role providing almost 20% of GDP and its natural resources include lignite, petroleum, iron ore, bauxite, lead, zinc, nickel, magnesite, marble and salt.<sup>1</sup>

As far as energy is concerned, Greece's total energy supply is 22000 ktoe and it mainly includes oil (10613 ktoe), natural gas (4500 ktoe) and coal (3285 ktoe). The rest comes from renewable sources, biofuels and hydroelectric power.<sup>2</sup>

Greece is a major importer of natural gas as it covers its own demand completely from imports. Moreover, the imports of crude oil reached 484,300 bbl/day, while the production was only 4,100 bbl/day, proving the importer status of the country.

#### *Cyprus*

Cyprus is an island country in the Mediterranean Sea, south of Turkey. It was a British colony until 1960 when it gained its full independence. Its real GDP was 35.3 billion USD and the most important sectors in its economy are tourism, food and beverage processing, cement and gypsum and ship repair and refurbishment. Its natural resources include copper, pyrites, asbestos, gypsum, timber, salt and marble.<sup>3</sup>

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<sup>1</sup> CIA. (2021).

<sup>2</sup> IEA. (2021).

<sup>3</sup> CIA. (2021).

Total energy supply in Cyprus accounts for 2240 ktoe and oil has the dominant position (99%), while the rest is from coal (0.2%), renewables (0.5%) and biofuels and waste (0.3%).<sup>1</sup>

Cyprus' electricity generation accounted for 4.6 TWh, while 85% of it came from fossil fuels, mainly from oil, and the rest 15% from renewable sources. Regarding natural gas and oil, Cyprus is a net importer as there is no production in the country at all.

### *Turkey*

Turkey is located in Southeastern Europe and Southwestern Asia (that portion of Turkey west of the Bosphorus is geographically part of Europe), bordering the Black Sea, between Bulgaria and Georgia, and bordering the Aegean Sea and the Mediterranean Sea, between Greece and Syria. Turkey's GDP is 720 billion USD and its economy is driven by its industry (automotive, petrochemical, and electronics industries) and the services sector.<sup>2</sup>

Turkey's total energy supply is 150000 ktoe and it is mainly oil (43000 ktoe), coal (42000 ktoe) and natural gas (37000 ktoe). Furthermore, hydroelectric power offers 7.800 ktoe and other renewables 13700 ktoe. Turkey covers its demand in oil and natural gas from imports, as either there is no production (oil) or the production is very low (0.5% of total natural gas demand).<sup>3</sup>

Total electricity production is 300 TWh, and coal is the dominant source (113 TWh) Furthermore, hydroelectric power and natural gas hold strong positions (88.8 TWh and 56.7 TWh respectively). The rest comes from wind power (21 TWh), geothermal (8.9 TWh) and biofuels (2.3 TWh).

Nevertheless, Turkey has serious problems regarding terrorism, as there are numerous groups in the country due to its geographical and cultural proximity with the Middle East. Islamic State of Iraq and ash-Sham (ISIS) and Kurdistan Workers' Party (PKK) are the most important groups, however there are others in the country such as the Islamic

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<sup>1</sup> IEA. (2021).

<sup>2</sup> CIA. (2021).

<sup>3</sup> IEA. (2021).

Revolutionary Guard Corps/Qods Force al-Qa'ida and the Revolutionary People's Liberation Party/Front.

### *Lebanon*

Lebanon was granted independence in 1943 by France and is located in the Middle East bordering the Mediterranean Sea, between Israel and Syria. The country has a free-market economy and its GDP is 53.2 billion USD, while the main sector is the tertiary sector, ie the services which mainly include the banking and the tourism sector.<sup>1</sup>

The total energy supply of the country is 8500 ktoe, mainly oil (8145 ktoe) which is not produced but imported from neighboring Arab countries. Coal accounts for 170 ktoe, biofuels 150 ktoe, renewables (excluding hydro) 68 ktoe and hydro 30 ktoe. Lebanon does not produce neither natural gas nor oil and it covers its demand from neighboring countries.<sup>2</sup>

The dominance of oil is also depicted in the energy mix for electricity generation, which is 21.5 TWh. Oil accounts for 20.8 TWh and the rest come from hydroelectric power.

However, Lebanon does have serious problems with terrorism as its proximity with Syria and many groups for the liberation of Palestine pose many threats. The terrorist groups in the country are Abdallah Azzam Brigades, al-Aqsa Martyrs Brigade, Asbat al-Ansar; Islamic Revolutionary Guard Corps/Qods Force, Hizballah; al-Nusrah Front (Hay'at Tahrir al-Sham), Palestine Liberation Front, PFLP-General Command, Popular Front for the Liberation of Palestine.

### *Israel*

Israel was declared after the withdrawal of Great Britain from the mandate of Palestine. In the last 25 years the Israeli economy has experienced a dramatic reform mainly based on the technology industry. Its GDP accounts for 394 billion USD and its main sectors are high-technology products (including aviation, communications, computer-aided design and manufactures, medical electronics, fiber optics), wood and paper products, potash and

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<sup>1</sup> CIA. (2021).

<sup>2</sup> IEA. (2021).



phosphates, food, beverages, and tobacco, caustic soda, cement, pharmaceuticals and construction.<sup>1</sup>

Its total energy supply accounts for 23000 ktoe and it is dominated by oil (9744 ktoe), natural gas (8135 ktoe) and coal (4772 ktoe), while renewables are not that developed (610 ktoe). Israel is a major importer of oil as there is no production in the country, however as far as the natural gas is concerned, the new discoveries in Leviathan and Tamar fields gave new perspective in Israel's energy outlook and the country started to export natural gas to Egypt and Jordan last year.<sup>2</sup>

For its electricity generation (72 TWh in total) Israel uses natural gas (46 TWh) and coal (22 TWh). The rest 4 TWh come from oil and renewable sources of energy.

Israel has serious problems with terrorist attacks as there are several Palestinian groups which are fighting for liberation. Kahane Chai, Popular Front for the Liberation of Palestine and Palestinian Islamic Jihad are the groups.

### *Egypt*

Egypt was firstly partially liberated from UK in 1922, however it gained full independence in 1952. It is located in Northern Africa, bordering the Mediterranean Sea, between Libya and the Gaza Strip, and the Red Sea north of Sudan. Its GDP is 323.8 billion USD and the main activities are agriculture, hydrocarbons, manufacturing, tourism, and other service sectors.<sup>3</sup>

For its total energy supply (97000 ktoe) Egypt covers by oil (36652 ktoe), natural gas (52000 ktoe), coal (3300 ktoe) and renewable sources (8000 ktoe). The country is producer of natural gas, from the total consumption of 57.71 billion m<sup>3</sup>, 50 billion m<sup>3</sup> come from its own production and the rest from imports. Egypt is also a producer of crude oil, as it produces 639000 bbl/day and 33% of it was targeted for exporting activities.<sup>4</sup>

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<sup>1</sup> CIA. (2021).

<sup>2</sup> IEA. (2021).

<sup>3</sup> CIA. (2021).

<sup>4</sup> IEA. (2021).

Its big production of natural gas is proven by the electricity generation as 80% of total generation comes from it (155 TWh out of 190 TWh). Oil is the second source of 23 TWh and hydroelectric power accounts for 12.8 TWh.

Apart from the Egyptian terrorist groups in the country, there are also the Army of Islam, the Islamic State of Iraq and ash-Sham – Sinai Province, Mujahidin Shura Council in the Environs of Jerusalem and the al-Qa'ida posing serious threats.

### *Libya*

Libya is situated in Northern Africa, bordering the Mediterranean Sea, between Egypt, Tunisia, and Algeria and has experienced economic and political instability over the last years. Its GDP is 52.2 billion USD and its economy is heavily based on natural gas and oil exports.<sup>1</sup>

Regarding the oil, Libya has a production of total 1 million bbl/day and is the 19<sup>th</sup> biggest producer in the world. Out of this total production, almost 33% goes to exports and as a result Libya is place 23th most exporting country for oil. However, Libyan exports are highly volatile due to the instability in the country. As far as the natural gas production is concerned, Libya is placed on the 43th position with 9 billion m<sup>3</sup>, while half of it is exported outside the country.

The total energy supply of Libya is 18000 ktoe and it is covered by oil (9500 ktoe) and natural gas (7600 ktoe). For its electricity generation, Libya is using only natural gas (22 TWh) and oil (11 TWh).<sup>2</sup> However, the country suffers from power outages, due to shortages of fuel for power generation.

Libya does have great problems regarding terrorist activities and the groups spotted there are Ansar al-Sharia groups, Islamic State of Iraq and ash-Sham – Libya, al-Mulathamun Battalion (al-Mourabitoun) and the al-Qa'ida in the Islamic Maghreb.

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<sup>1</sup> CIA. (2021).

<sup>2</sup> IEA. (2021).

## 4.2 Energy mix

Figure 1 shows the total energy supply by source for the countries and the region under study.

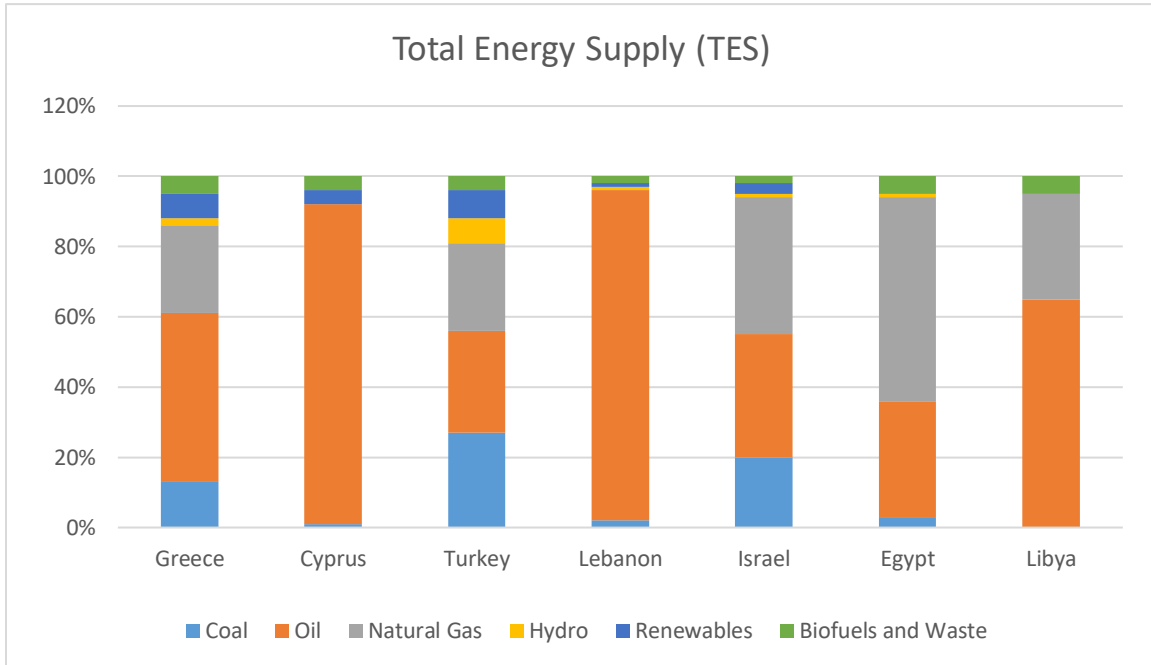


Figure 1. Total energy supply (TES) by source

Source: IEA, 2021<sup>1</sup>

The total energy supply shows the sources used in a country to cover its own needs for any use, either commercial, or industrial or residential. From this figure there are different conclusions that can be derived. First of all, there is severe dependence on oil for all the countries above. In Cyprus and in Lebanon the percentage of oil is more than 90%. This would not be a problem, if the production was done internally. However, all these countries do import great amounts of oil, with the exception of Libya, and this creates dependence on others' production and exporting activities. Secondly, the same applies for the natural gas, since there are no production activities in the region, with the exception of the recently discovered fields in Cyprus and in Lebanon. Especially for the natural gas, the exporters are very limited, thus creating dependence and in the foreseeable future this will not

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<sup>1</sup> IEA. (2021).

change. As a result, Russian natural gas will continue to dominate in the area as well as the Azeri natural gas, mainly in Turkey.

On the other hand, the renewables prove to have gained a significant part in the energy mix. There have been significant developments during the past two decades and as a result this have led in increasing their capacity. However, this is the case only in Greece, Turkey and Israel. Even though there is strong potential in the other, Cyprus or Lebanon or Libya do not have the necessary resources to develop significantly, such as capitals or equipment or human resources.

### ***4.3 Energy geopolitical landscape in the Eastern Mediterranean***

Under the geopolitical perspective this region is very important since it is the crucial crossroad of three continents and a pathway for the trade in Europe, North Africa and the Middle East. The high importance of the region is being proven by the interference of big powers such as the USA or France in the region. They see it as a European corner where they must be active since there are interests put into play.

#### *4.3.1. Gas discoveries*

The interest in the Eastern Mediterranean started in 2009 when the first gas field in the region were discovered. Specifically, the discovery of the Tamar and Leviathan fields off the shore of Israel and the Aphrodite field off the shore of Cyprus created a new era. These discoveries gave a new era as they were followed by high expectations in an attempt to create a new cooperation and economic activity in the region, as described by Shin and Kim.<sup>1</sup> However, there was a decline in these expectations, mainly due to the successive downward revisions of the expected resources. These developments raised scepticism of the general idea that the eastern Mediterranean might become a gas-exporting region. Furthermore, in Israel there was a serious political debate for the use of these reserves and this led to significant delays of key decisions.

During 2015 Italian energy company ENI discovered the Zohr gas field off the shore of Egypt, which is the biggest discovery in the region. Then, this discovery was followed by

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<sup>1</sup> Shin & Kim (2021).

other discoveries in the country's offshore waters. Due to very fast activities, production started in 2017 and as a result, Egypt became an exporter in the Middle East countries.

#### *4.3.2. EastMed Pipeline*

The EastMed pipeline holds 1300 km of offshore and 600 km of onshore pipeline sections and mainly, it is projected to transport natural gas from the Levantine Basin in Israel and the gas fields in Cypriot waters to mainland Greece and Italy. If the project reaches its full potential, it will be the largest offshore gas pipeline in the world. The project has received full support from the European Union and its final cost is estimated up to 6 billion Euros, making it one of the most expensive gas pipeline projects. Its operations are expected to start in 2025.

The most important aspect of the EastMed pipeline is its geopolitical significance, Tsakiris states.<sup>1</sup> Firstly, it proves the necessity of the deep governmental cooperation in the Eastern Mediterranean. Since energy sector is multidimensional, it is not limited in a certain country, thus energy projects need significant diplomatic consensus. In the case of this pipeline, Greece, Cyprus and Israel prove this fact. Secondly, and most important, it will play a key role for the energy security of the European continent, as it will provide one more potential energy source, thus helping in the diversification of the sources and decreasing the European dependence on the Russian exports and on LNG imports as well. Furthermore, it will help the development of gas trading hubs in Greece and Italy and facilitate gas trading in south-east Europe.

On the other hand, the project has been a major cause of tensions in the region by the Turkish side. Turkey is the main country which opposes the project because it will bypass long Turkish coastline to deliver gas from the eastern Mediterranean to Europe. Even though, Turkey has false claims over Greek and Cypriot territorial waters, it reached an agreement with Libya to create an exclusive economic zone. This agreement clearly contradicts both international law and the need for cooperation among the countries and it is used by the Turkish government to oppose the energy developments and cooperation in the area.

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<sup>1</sup> Tsakiris (2021).

#### ***4.4 Geopolitics and energy security***

The concept of the interconnection of geopolitics and energy security began after the two oil crises of the decade 1970s. Conant and Gold were the pioneers of this topic and in their work they made the assumption that the country which possesses the energy resources, will always control the other countries that depend on these resources.<sup>1</sup>

This domain of studies gained more and more interest among academics and researchers during the last three decades because of the enormous increase in energy needs. Vivoda also described other facts that led to the increase study of energy security and geopolitics, such as the increase in energy prices, the increasing demand of resources, the scarcity of resources and the effects of the climate change. Moreover, Vivoda pointed out that the increase of energy use in Southeastern Asia, and particularly, in China and India, will have strong geopolitical consequences.<sup>2</sup>

On their paper, Amireh and Crijns-Craus, proved the connection between politics and energy relations for the European Union, as the energy relation will be highly politicized. However, they point out that there are major concerns for the European Union landscape based on geopolitics. For example, they state that the emergence of political Islam in the Middle East poses threats for EU's energy security.<sup>3</sup>

Vidakis and Baltos, tried to create a new method of evaluating the connection between geopolitics and energy, they state that energy related issues prevail over politics and economics in international decision making, and that energy factors are critical factors for the Western countries. Moreover, they say that countries try either to become energy superpowers or to join worldwide energy networks; in order to prove their power countries relate it to energy matters. Vidakis and Baltos set Turkey as an example of this type of power, because Turkey uses its location and its pipelines in order to become an energy hub.<sup>4</sup>

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<sup>1</sup> Conant & Gold (1978).

<sup>2</sup> Vivoda (2010).

<sup>3</sup> Amineh & Crijns-Graus (2018).

<sup>4</sup> Vidakis & Baltos (2015).

Furthermore, Olayele talked about the strategic geopolitical importance of pipelines.<sup>1</sup> He analyzes the interconnected pipeline system between China and the neighboring countries in Central Asia. Not only do these pipelines bring strong economic benefits for Shanghai, but also they could serve as a weapon for participating countries' foreign policy. Moreover, the importance of pipelines is widely proven in the case of Ukraine and Russia, where the disputes between these two countries resulted in Russian's cutting the supply to Ukraine. Thus, energy is central to political and economic landscape of Ukraine.

In addition, there is Saudi Arabia, which is the largest oil exporter and the second largest oil producer. This country has the ability to play a key role in regional politics due to its participation to OPEC and its ability to reduce oil production in order to increase oil prices. Saudi Arabia's prioritization of a larger market share over high oil prices will always be a strong weapon for great influence worldwide.

Pascual and Zambetakis demonstrated a connection between international politics and fluctuations in energy prices.<sup>2</sup> In addition, they state that political power has been gathered in the hands of countries which are energy exporters by their ability to control the international scene; this was the case of the sanctions of Iran.

#### ***4.5 Energy security and threats in the Eastern Mediterranean***

The subject of the energy security in the Eastern Mediterranean is a very complicated issue with dimensions touching political, economic, strategic and energy issues. In the region there are so many different countries and cultures which are active, thus creating a very unstable environment for every actor.

The Eastern Mediterranean region has become an international hotspot for the geopolitical competition that discoveries in the last decade follow. Due to significant Erdogan's energy ambitions, the region has become a stage for rivalries between countries, particularly Greece and Turkey.

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<sup>1</sup> Olayele (2015).

<sup>2</sup> Pascual, C. & Zambetakis, E. (2010).

As Stergiou puts it, in the last years there were some significant discoveries in offshore Egypt, Cyprus and Israel which altered the landscape of the region, not because of their size and their possible potential, but mainly due to the security challenges that they have created. In fact, there were alliances that broke, the existing balance of power has changed, and new energy insecurities arose.

The natural gas reserves, which were discovered in the past decade in the region, are part of other potential resources located in the Levantine Basin (Lebanon). There are also beliefs for more and bigger resources in the region, for example south Crete.<sup>1</sup> These are a very important strategic matter because the total amount of natural gas reserves of the Eastern Mediterranean and its potential production will create new different energy sources for the European market, which could partially satisfy the energy demands of the EU for many years, as Giannakopoulos notes *“therefore, it may be concluded that already known reserves, as well as expected discoveries in the Levantine Basin, are well placed to become an additional natural gas supply source for the EU, constituting an important alternative (for example, to Russian or Iranian gas) that will provide a high level of energy security for Europe.”*<sup>2</sup>

Tsakiris makes a reference for the benefits of the East Med pipeline project for the energy security of the whole European continent. This project, contrary to the belief of high geopolitical risk of the region, could serve as a major weapon for the European markets for their diversification of resources.<sup>3</sup>

Mamedov points out the international dimension of the Eastern Mediterranean. Specifically, he talks about the American interests in the region, which are the support to Israel and the support for NATO's bodies and infrastructure combined with the settlement of Israel-Palestine dispute, in favor of Israel. Russia also has interests in the area as it has a strong presence in the Syrian civil war. He concludes that the fact that there is no

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<sup>1</sup> Stergiou (2017).

<sup>2</sup> Giannakopoulos (2016).

<sup>3</sup> Tsakiris (2021).



superpower in the region which could impose its own will and the long-standing conflicts, such as the Cypriot question, undermine regional security.<sup>1</sup>

On the same matter, Pontera and Ruszel (2017) point out the interest of EU for the region beyond the fact that there are EU members in the region. They talk about the refugee crisis which start from that region and the destabilization it causes as it is a crucial matter which cannot be adequately solved. For this reason, they think that EU would support an American-led energy agreement between Israel, Cyprus and Turkey in order to solve the refugee crisis, even if this agreement would mean that additional gas would pass from Turkey and then to European markets, thus enforcing Turkey's geopolitical role.<sup>2</sup>

The success of the projects in Eastern Mediterranean requires multi-billion investments. For example, the Tamar field, which is a comparably small field, is developed by consortium consisting of Noble Energy and Israel's Delek Group and it required 4 billion USD as an initial investment. The Leviathan block, which is much larger, required 10 billion USD investment, as stated by Goldthau et al.<sup>3</sup>

However, there are several important factors that pose different threats for the energy sector in the Eastern Mediterranean. These factors are of different natures, such as political, diplomatic, economic or military.

First of all, there are the political factors that cause energy insecurity in the region. As Mohamedi says the revolution and the post-revolution competition in many states of this neighborhood did destroy a stable environment and led to catastrophic decline in oil and gas supplies. Several years of malfunctioning economies in some states led to failed states and revolutions. These revolutions have occurred in the last 15 years in Libya, in Egypt and in Syria, thus creating a very dangerous situation that could have energy impacts as well. They created a severe problem because Libya was in fact a very large producer for many decades. However, today there are two governments with their own army which compete for the resources and there are threats for their destruction.

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<sup>1</sup>Mamedov (2020).

<sup>2</sup>Prontera & Ruszel (2017).

<sup>3</sup>Goldthau, Richert & Stetter (2020).

Furthermore, there is the problem of Turkey which poses a threat to stability in the region. Erdogan's attempt to increase the Turkish influence in the region is a threat for the countries. Indeed, the idea of a regional leader in the energy sector is a key aspect of Turkey's foreign policy, as noted by Richert.<sup>1</sup> With a military presence in Syria and Cyprus and the ongoing disputes with the Kurdish people and its false claims over the Aegean Sea, Turkey poses a constant threat for the cooperation and the peace in the Mediterranean. Due to the increasing interconnection of political goals and energy in the region, Turkey acts as a revisionist power and threatens every state actor. Turkey is a net energy importer as it imports 95% of its domestic consumption and it is trying to use its geostrategic location to become a transit country and to reduce the imports. This behavior has resulted in Turkey's isolation from every state, while others such as Greece, Cyprus, Israel and Egypt have boosted cooperation.

However, another important threat is the competition over resources. There are many rivalries in the region, the Israeli-Arab is the most difficult to solve, but there is competition for example in the EEZs of Cyprus, with Turkey demanding a big part of it or even Lebanon claiming some of the blocks, thus the Cypriot waters provoke the most problems and disputes, as said by Holland.<sup>2</sup> The long-lasting problems of the Turkish occupation of 37% of Cyprus and the Israel-Palestine dispute do pose a major threat for the stability in the region. As these problems remain unsolved, the energy industry in the Eastern Mediterranean will never reach its full potential.

Ezrahi recorded areas of potential risks of conflict. First of all, potential discoveries in offshore Israel and Gaza in disputed areas or the underdevelopment of the Gaza Marine field. She explains that this field, if not adequately developed, could pose serious problems between Palestinians and Israelis. Other potential conflicts could happen between Lebanon and Israel, as Lebanon plans to exploit its offshore natural gas resources. Blocks are part of the maritime zone of a state, in which the state can exercise its sovereign rights. This contains the award of the block to a private energy company, which will then be responsible for research, exploration and extraction of natural resources. There is a maritime area of

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<sup>1</sup>Richert (2016).

<sup>2</sup>Holland (2015).

1400 km<sup>2</sup> which are considered to contain amounts of hydrocarbons and are claimed by both Israel and Lebanon and more specifically, it is the Block 9 which is located just 4 km from Lebanon's territorial waters, but Israel claims it as part of its own EEZ.<sup>1</sup> Additionally, there are the claims of Turkey over Cypriot maritime zones. While Cyprus has reached a mutual agreement with both Lebanon and Israel, Turkey tends to put obstacles to Cypriot claims to its offshore gas fields. Moreover, there are always the Turkish claims over Greek maritime zones, which Turkey does not accept violating the international law of the sea. As a result, there is high probability to continue to witness tensions in the Greek and Cypriot EEZ, caused by Turkey, if any developments are occurred.

#### ***4.6 Comparative case studies of Eastern Mediterranean countries***

The political environment of a country or neighboring countries is the first crucial aspect as far as the energy industry is concerned. Thus, it is necessary for the energy security of these states to address their political stability. Since the energy sector is highly politicized, diplomacy affects the energy imports and the energy landscape as a whole.

From the countries currently studied, Greece, Cyprus and Israel seem to have achieved a sufficient level of political stability. In these countries, there are no fears for unrest or any other kind of revolution, as is the case in the Arab world. Furthermore, the political environment of these countries can always guarantee the security of supply, thus there will be no problems related to politics and energy, since the stability will be a beneficial factor. Being part of the European Union helps Greece and Cyprus have political stability, and having strong relationship with the EU helps Israel mostly for economic reasons, such as trade.

However, this is not the case for the rest of the countries. Egypt, Libya and Turkey do face political instability. It is important to mention that the energy sector and energy security is not the main factor of this instability. In these countries, there is always a threat for political unrest, especially in Libya and Egypt due to the serious problems their societies are facing. For example, this significant disappointment resulted in the Arab Spring a decade ago, with

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<sup>1</sup> Ezrahi (2016).

huge implications for the region. In Turkey, people face serious problems which are mainly related to economic factors. Inflation is on high levels for the last three years, even before the inflation started rising in 2021 for the Western world because of the coronavirus pandemic. Moreover, the Turkish currency is always devaluated and this creates a serious economic crisis, which cannot be faced by the Turkish leadership. These problems, if not faced adequately, may have negative impacts on energy security or security of supply.

Another crucial factor for the region and the countries is the conflict or the threat of conflict due to energy related issues. This is the case of the Eastern Mediterranean due to the Turkish diplomacy. Even though Turkish leadership mentions that it is in favor of the regional cooperation in the field and it favors economic development, it poses serious threats for the stability of the region and for other countries. Greece, Cyprus, Israel and Egypt do have strong economic and diplomatic ties and have announced plans for stronger cooperation in the field of energy, such as the electrical interconnection. Turkey does not recognize the international law of the sea and its respective articles and as a result Turkey poses seriously false claims over the EEZ of its neighboring countries. Furthermore, to this though, Turkey seeks strong ties with Libya, and their false maritime deal, is the region's number two destabilizing factor. Moreover, another potential case of conflict is the maritime zones of Israel and Lebanon, which remain formally at war, as there are claims over a disputed sea border. Nevertheless, this is not the size and level of the threats of conflicts posed by the Turkish side.

The problem of availability is a serious matter for every country under study, apart from Libya. This is because of many reasons, firstly because of the net importer status that these countries have. Their dependence on importing natural gas, oil or even electricity make them dependent on other countries' production and even though they may cover their domestic demand, they are also vulnerable to price volatility. Since they cannot control the production and the trade of energy products, they cannot affect the prices neither, and as a result in difficult times, such as today because of the coronavirus pandemic, they face increased energy prices. On the other hand, Libya seems to be more independent and thus not that much vulnerable to externalities. This is because Libya is a producing country and can cover its own domestic demand without being dependent on energy trades as much as

the rest countries of the region. Moreover, the problem of the availability is also related to the existing infrastructure. This may be a problem for Greece or Cyprus, due to underdevelopment of the infrastructure. Despite the benefits from the EastMed pipeline, the project is slowly going forward and there are serious threats that it may not even proceed because of the American statement some weeks ago. This leads to no diversification of resources for the whole region as the interconnection is not going forward. This is not the case actually for Turkey, because due to its developed pipelines, it can get natural gas from Russia, Azerbaijan and Iran, thus having multiple choices to cover its demand. Another, third aspect of availability, which concerns the total of the countries under study, is the least developed renewable energy sources. Even though there is potential for their further development, still the current percentage is not sufficient as it covers only a small percentage of the TES of every country. By promoting and further developing more RES, the region could cover a part of their demand and find another source of energy as well.

The threat of increased prices is currently one of the most important threats and is related to the affordability. Due to the pandemic, the production was cut and thus the energy prices increased significantly. Natural gas prices more than doubled in a year, wholesale prices for electricity are currently reaching 250 euros per MWh in Greece. Totally, the whole world is currently facing serious problems related to the increased energy prices, which is expected to continue for the whole year of 2022. This problem is highly obvious in Greece, Turkey, Israel, Lebanon, and less in Cyprus, which is affected but not at these levels, as far as the electricity prices are concerned.

In addition, there is always fear for terrorist attacks in some of these countries, which could possibly affect the energy security. Libya, Egypt, Israel and Turkey are always vulnerable to these kind of attacks, thus disrupting their supply. Moreover, these countries could be possibly affected by terrorist attack in the wider region of the Middle East, where the most attacks take place. For example some attacks in Iraq, Syria or Iran will definitely affect the energy supply of the region, thus including the countries under study. Moreover, since the energy trade is done by the sea, the Eastern Mediterranean could be a region where possible attacks on carriers could happen, even though there are not many possibilities.

There are threats that are faced by every country in the region, such as the diplomatic landscape, the price volatility especially today when energy prices are on the constant increase, and environmental threats, mainly due to the effects of climate change. Furthermore, there are more major threats which are highly related to political factors. These threats are the terrorism, militarization and the political environment itself, which creates societal tensions and unrest. These problems are present in Libya, Egypt, Turkey, Israel and Lebanon. Last but not least, the problem of limited availability of sources can be noticed in Egypt, Israel and Cyprus.

Table 3 shows the possible threats that these countries currently face.

*Table 3. Possible threats posed to countries under study*

<b>Countries</b>	<b>Possible Threats</b>
Turkey, Libya, Lebanon, Egypt	Political Environment
All	Diplomatic Factors
Egypt, Israel, Cyprus	Limited Availability
Turkey, Libya, Lebanon, Egypt	Sociocultural
All	Price Volatility
All	External Disruptions
All	Environmental Threats
Israel, Turkey, Libya, Lebanon, Egypt	Terrorism
Israel, Turkey, Libya, Lebanon	Militarization

Source: Edited by the author

To conclude, among the countries under study, those who participate in the European foundation seem to have benefited the most. Greece and Cyprus do have experienced many positive results from EU participation. However, these two countries are in need of more projects for enhancing interconnection both internally and with the neighboring countries. Furthermore, these two countries face serious challenges from Turkey, which threatens their national security as well. On the other hand, Turkey seems to have diversified its resources and to have a more stable and better functioning energy sector as it has adequate infrastructure and its location is important for energy trade. Nevertheless, Turkey is the most problematic country because of the disrespect to international law and its threatening neighboring countries. Moreover, Israel and Lebanon do face serious diplomatic problems because they are located in a region with huge tensions and this always poses threats. In addition to that, their energy production needs to be increased and their plans to promote RES projects are on the right direction to enhancing their energy security. In the African continent there is Egypt and Libya, which face serious internal problems due to the Arab Spring and their continuous problems. There is always fear of a revolution or tensions and as a result governments cannot focus on energy and diplomatic issues. Furthermore, there is no adequate production in these countries and their increasing demand will be a serious problem to address in the coming years.

Table 4 shows concluding remarks.

*Table 4. Concluding remarks*

<b>Countries</b>	<b>Concluding Remarks</b>
Greece	<ul style="list-style-type: none"> <li>• Many benefits from EU participation</li> <li>• Must reduce carbon in its energy mix</li> <li>• Needs development of interconnection</li> <li>• Serious problems posed by Turkey</li> </ul>
Cyprus	<ul style="list-style-type: none"> <li>• Many benefits from EU participation</li> </ul>

	<ul style="list-style-type: none"> <li>• Minimum production</li> <li>• Serious problems posed by Turkey</li> <li>• Needs development of infrastructure</li> </ul>
Turkey	<ul style="list-style-type: none"> <li>• Adequate infrastructure</li> <li>• Many choices to buy from</li> <li>• Poses threats for the region</li> <li>• Does not respect international law</li> </ul>
Israel	<ul style="list-style-type: none"> <li>• Serious diplomatic problems</li> <li>• Ambitious plans for RES</li> </ul>
Lebanon	<ul style="list-style-type: none"> <li>• Minimum production</li> <li>• Serious diplomatic problems</li> </ul>
Egypt	<ul style="list-style-type: none"> <li>• Serious internal problems</li> <li>• Too much demand to cover</li> <li>• Strong potential for RES</li> <li>• Must focus on further developing RES</li> </ul>
Libya	<ul style="list-style-type: none"> <li>• Adequate production</li> <li>• Serious internal problems</li> </ul>

Source: Edited by the author



## **Chapter 5. Conclusions**

### ***5.1. Summary, conclusions and recommendations***

The region of the Eastern Mediterranean is of high geopolitical importance as it is the crossroad of three continents and the point where different countries and civilizations meet. However, these countries face very important challenges for their security, and especially for their energy industry.

This study has shown the most possible threats posed at this region and since the energy sector is very time intensive, these threats will continue to exist in the coming years as they are very difficult to solve.

Many studies have focused on identifying the threats of these countries, this study has noted the political factors, the societal dimension, diplomatic reasons and possible conflicts for the energy sources as the main sources of threats, after an analysis of these countries.

Among the diplomatic factors, the attacking position of Turkey is the most important, because this country does have revisionist aspirations for the whole region under study and it poses serious threats to any cooperation that needs to take place. For example, the project of EastMed faces the Turkish challenges and the whole project is under risk because of these very aspirations. Regional conflicts of the region is another major factor that can negatively affect energy security, because of the destabilization that will provoke for Israel, Egypt and Lebanon.

In order to address these problems and these threats there must be strong willingness for cooperation and to overcome the possible obstacles. To this purpose, the political stability of every country is number one contributing factor, while the positive economic outcomes should be a driving factor for the governments of these states.

Two things remain to be seen, first is the contribution and the help of the great powers of the world and notably the USA. These great nations do have a lot of power and can have a positive diplomatic impact to promote cooperation in the region and to solve possible

problems. Secondly, the possible impact of the war between Russia and Ukraine will be significant, thus affecting the intentions of every state in the region.

### ***5.2. Limitations of the study and recommendations for further work***

The present study has potential limitations. Since the energy industry is driven by private energy companies, mainly multinational companies, the actions or intentions or the power of the companies active in the region was not examined. Secondly, another limitation of this study is the absence of extensive quantitative analysis, since the energy security concept can be studied in this way as well, giving more precise results.

Therefore, future study could try to include quantitative analysis of more available data, and definitely there must be another valuation of the concept when the war between Russia and Ukraine ends because the European continent and its energy landscape and its energy strategy will not be the same.

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