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Energy Resources In Israel: Impacts On The State Security System

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Declaration

I, Qais Tayseer Mohammad Samara, declare that this thesis and the work presented in it are my work and has been generated by me as the result of my original research:

ENERGY RESOURCES IN ISRAEL: IMPACTS ON THE STATE SECURITY SYSTEM

The work provided in this thesis, unless otherwise referenced, has not been submitted by others elsewhere for any other degree or qualification.

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List of Abbreviations

BCM: Billion Cubic Meter

BTC: Baku-Tbilisi-Ceyhan pipeline

EastMed: East Mediterranean pipeline

EE: Energy Efficiency

EEZ: Exclusive Economic Zone

EIA: US Energy Information Administration

EMG: East Mediterranean Gas pipeline

EU: European Union

EV: Electric Vehicle

IEA: International Energy Agency

LNG: Liquefied Natural Gas

OPEC: Organization of the Petroleum Exporting Countries

RE: Renewable Energy

RoC: republic of Cyprus

US: United States of America

YM: Yam Tethys

Abstract

This Thesis studies the new gas discoveries in Israel from a security perspective. It seeks to answer an important question related to state security: ***What is the impact of energy discoveries and supply on Israel's state security?*** The question is adopted approach by employing an analytical and historical methodology to explore future Israeli changes. The analytical part builds on a theoretical review of energy security and geopolitics of energy, which help understanding historical events, mainly the impact of natural gas discoveries in 2009 on security and relations through additional analysis from the liberalism theory, and introducing the main findings and results.

Israel consolidates its relations with Greece and RoC after gas discoveries at Turkey's expense and crowns by the EastMed pipeline to supply Israeli gas to the EU via the Greece-RoC sea's route. Although the EU supports the project to diversify its energy resources, the pipeline also faces rejections, mainly from Turkey, due to unsettled EEZ, principally between Turkey, Greece, and RoC. The project will also threaten Turkey's economic position as an energy hub for the EU and Israel. Hence, Israel is depoliticizing its economic relations with Turkey to maintain the Turkish routes' energy flow. Besides, Russia may oppose this project under the umbrella of its intervention in Syria. Still, it opposes this pipeline since it may reduce its master energy supply in the EU.

In contrast, Israel is interested in a positive peace like its relations with Egypt and Jordan, Israeli primary gas consumers. It also expands its energy infrastructure with regional countries, besides its utilization of Egypt's well-established energy infrastructure by exporting its LNG, which bypasses the EastMed pipeline's late implementation. Further, Egypt may threaten Israel's energy position, like after the

Egyptian revolution in 2011, or may make control over the supply chain to Israel in The Straits of Tiran. In this regard, the EastMed project is essential for the Israeli energy future as it opens additional or alternative markets to the Egyptian option. On the Palestinian side, Despite the Oslo agreement that did assure Israeli- Palestinian energy cooperation, but Israel still uses energy supply to the Palestinian as a controlling method. On the contrary, Israel needs them as part of its energy customers. Moreover, Israel benefits from the late development of Palestinian gas fields, and the “no peace” situation still serves Israel's energy position against Palestinians.

The main threats for the Israeli energy sector are coming from states' conventional threats like Iran. Iran can interrupt the supply chain in the Red sea or the Tiran Strait, whereas the militants, like Hamas or Hezbollah, can only do limited damages in the energy sector while the conventional threats directly affect the Energy reliability. Israel will not permit interrupt energy reliability, even leading to war. In contrast, Israel did not favor wars that may discourage international investments in its energy sector.

These threats stimulate Israel to increase its naval forces capacities using the gas revenues. This weaponization policy is to cover the gap in Israel's sea forces that was neglected traditionally. Gas revenues make affordable energy prices, increase industrialization, and export competitiveness. The abundance of domestic energy resources may encourage Israel to practice the Long wars instead of the Quick war theme, which was applied in the past depending on energy and economic scarcity. Finally, the US may support Israel under threats of energy security like its efforts to protect the Israeli energy supply and the Gulf oil flow in the 1970s, 1980s accordingly.

Noting that, the US strengthens its relation with RoC after the gas discoveries by the 2019 Congress decree; besides, Israel is increasing its military cooperation with RoC.

Keywords: energy security, reliability, diversification, geopolitics, Israel, Egypt, Turkey

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1. Introduction

From the beginning of this century, Israel increased its ambition to be an energy-independent state, crowned by multiple discoveries in 2009 like the discovery of Tamar natural gas fields and Leviathan fields one year later (Even, 2010, p. 7). These discoveries eventually put Israel in the energy game in the Eastern Mediterranean region and worldwide. The investment in energy fields is not a simple activity for a small country like Israel under a common conflict situation. In respect of energy resources, Israel has many challenges and obstacles, which could be clear regarding gas exploitation domestically, exporting, interdependence market, securing the infrastructure, and opening new gas supply chains (Even & Eran, 2014, p. 194).

In contrast to this energy resources poverty, the oil and fuel infrastructure has been in Palestine since the British mandate era; for instance, the Kirkuk-Haifa pipeline and Haifa refinery plant (Shaoulian-Sopher, 2017, p. 143). After the State of Israel was established, Israel took these facilities and wanted to be energy producers by starting gas and oil explorations in the 1950s; most discovered fields had minor capacities (Bahgat, 2010, p. 409). In the years 1953-1992, Israel has carried out 263 wells exploration and also developed 122 wells including many crude oil or gas fields, but most of these fields were not sufficient or commercially beneficial (Gill, 1992, p. 231). These energy explorations make an initial view of Israel's experience in the energy field, but the transformation to an energy-rich country is a different story.

Israel is located in the Middle East, as an energy-rich region, but it did not participate early in the energy-producing association such as Egypt, Saudi Arabia, Iraq, and Iran. It's important to highlight that the Middle East region has important channels for exporting energy (Eisenkot & Siboni, 2019, p. iv). Moreover, the Middle East's conflicts are protracted, energy resources are one of the main issues in these conflicts, and security questions regarding it are not new. For example, although Saudi Arabia has a solid defense doctrine, including the Patriot Air Defense Missile System, Abqaiq-attack in eastern Saudi Arabia was executed by Houthis last September 2019 against the energy-oil fields. This attack assures that securing the energy resources is not a simple task; this attack happened even though international investors are developing the energy sector of Saudi Arabia. These events triggered the importance of studying the new gas discoveries in Israel from security perspectives.

1.1. Thesis’s Question and Arguments

The Thesis will answer questions about Israel's future from energy perspectives. Developments in the energy field are happening in the changeable world; US withdrawal from the Middle East and the Russian intervention in Syria. Turkey, as a regional power, has its narrative about Eastern Mediterranean Sea boundaries and energy resources. There are also other claims in Lebanon and Syria about sea boundaries. At the same time, Israel has not settled its conflict with Lebanon, Syria, or even the Palestinians.

Furthermore, Israel does not directly relate to the leading Arab energy competitors such as Saudi Arabia, Iraq, Libya, or Algeria. These entire issues make the research relevant to regional situations. On the other hand, the Thesis will investigate Israel’s capabilities and abilities to secure energy and gas resources and impact its foreign relations. Additionally, the Thesis will enhance the understanding of Israeli security doctrine after new energy discoveries. The Thesis associates the normalization development with some Arab countries during 2020 and its impact on the energy sector.

This Thesis will answer the following main question: ***"What is the impact of energy discoveries and supply on Israeli security?"*** The sub-questions are the following: What are the expected effects of the Palestinian-Israeli conflict on Israel's energy sector development? How would the energy sector and discoveries change or affect regional Israel's relations, including Arab neighbors? What are the impacts of the energy sector and new discoveries on the Israeli security system? How could new discoveries affect the Israeli economic system? What are the roles of clean and renewable energy in the energy sector of Israel?

The Thesis argues that Israel will alternate its foreign relations based on the new gas discoveries and the projects that assist in exploiting them. This argument builds on the need to meet energy security requirements in Israel. Additionally, the Thesis statement explains the Israeli policies to establish peace with its neighbors, which increases its passion for living in a peaceful region to gain natural gas' profits. The Thesis also argues that the new discoveries and energy relations may escalate tension in the Eastern Mediterranean region depending on differences in natural gas exploitations. This complex regional conflict may be considered a continuation of previous disputes or a new war focusing on the energy sector.

In conflict context, the Thesis argues that Israel is fearing Hamas or Hezbollah threats against its energy sector, but it will shape the level of these threats compared to other threats. The Thesis explains that the new gas discoveries need a novel approach in Israel's weaponization policies. Most natural gas fields are located offshore and far from the mainland. Furthermore, the Thesis argues that there is a probability in the Israeli security decision to change its traditional war theme relying on the abundance of energy resources and its economic benefits associated with the new weaponization policy.

The Thesis approaches in answering the research questions is a historical and analytical methodology. In this regard, it depends intensely on the introduction of historical events linked with energy supply and security in Israel by focusing on the periods after domestic gas discoveries and revolutions in the Arab world, which means that the research applies its study from 2009-2019 mainly. The historical review will trace back the history of the Israeli energy system since 1948, the year of Israel's establishment, including the official Israeli statistical records.

The Thesis analytical part builds upon the theoretical review of energy security and geopolitics of energy theories, making the analysis and answering the research question carefully, i.e., it explains and analyzes Israel’s practices in the energy sector. Besides, the research will investigate how Israel is affected by new discoveries in the complex region. The Thesis follows-up the analytical part by conducting interviews with experts in energy security, the geopolitics of energy which will enrich it with some views not covered in the traditional theories.

On the challenging side, the Thesis will map Israeli energy relations depending on economic statistics as mentioned. Israel is not a member of the International Energy Agency IEA, and the official data is not published probably. Despite that the IEA membership makes many benefits, Israel sees this agency as obliging to publish its energy number based on international standards. In other words, energy statistics are classified in Israel as security data (Rettig, 2016, p. 512). This Israeli behavior indicates the high confidentiality levels that distinguish the Israeli energy sector policies (Rettig, 2016, p. 524).

1.2. Chapter Divisions

The Thesis will be divided into six chapters; the first one is this introduction, including the Thesis's questions, arguments, the importance of the Thesis, research methodology, and literature review. The second chapter introduces a historical study of Israeli energy relations. It covers the period after the state's establishment until the gas discoveries period in 2009. It studies the Six-Day war in 1967 impact on the energy sector and how it changed the Israeli position in the energy market, which also introduces the Iranian role to maintain Israeli energy security. As the newborn country, Israel faced Suez Canal's Egyptian monopoly and oil embargo during October War 1973. It was succeeding in avoiding negative impacts by the Iranian role and US support.

This chapter also describes how the US guaranteed energy supply to Israel in the 1970s and how that promoted the Israeli-Egyptian peace process. The chapter sheds light on the Soviet Union's collapse in the 1990s and how Israel built energy relations with post-Soviet countries via Turkish energy routes, making Turkey a supply chain of energy products to Israel. Finally, it mentions the initial gas discoveries in the Palestinian-Israeli offshore, which helped the natural gas transition in the 2000s by importing Egyptian gas via an undersea pipeline.

The third chapter introduces the new gas discoveries in Israel after 2009, especially Tamar and Leviathan gas fields offshore. It also examines Israel's energy sector reform to promote domestic gas and infrastructure developments and how Israel modifies the regulatory framework. It also studies the economic impacts after these domestic gas discoveries and avoided cutting off Egypt's gas supply. This chapter tests Israel's decision-making process for the energy sector, and describes the process that resulted in shaping the export policy of gas. On the other hand, it sheds light on other regional energy discoveries in Egypt, Cyprus, or Lebanon. Besides, it reviews the political tensions that affected the Eastern Mediterranean regional energy sector and the future of exporting gas routes, mainly the EastMed project. Finally, it introduces international players' roles in regional energy projects and cooperation.

The fourth chapter is a theoretical chapter that the Thesis builds on to make its analysis and findings later. It explains energy security theory, its components: availability, affordability, reliability, and sustainability. Additionally, it elaborates on geopolitics theory and its impact on energy by focusing on the energy Chokepoint concept. These theories explain wars and conflict effects on energy resources and weapon trade-related. It also introduces energy theories related to the Middle Eastern region as a rich energy resources region, conflict-related and US role and interventions, especially after oil discoveries and then based on the Iraqi-Iranian war in the 1980s. It shapes the role of military existence in securing energy resources and supply.

The fifth chapter analyzes the Israeli energy system based on previous theories, especially energy security theory and geopolitics of energy. It explains that Israel understands the natural gas discoveries in 2009. It plans to exploit this reservoir carefully to meet energy security requirements. It focuses on Israeli efforts to apply energy reliability by different tools to avoid any energy interruptions that affect Israeli life as a military and small state. On the other hand, it introduces the geopolitics of energy in Israel. It's related to its supply chains in the Eastern Mediterranean or the Red Sea associated with Iranian threats. In this context, this chapter studies how the Israeli security system impacts the energy sector and vice-versa by elaborating dangers for the energy system, peace process, and related policies to maintain its energy needs with some reviewing of liberalism theory as analysis of these behaviors. Finally, the sixth chapter concludes the Thesis by answering research questions and discusses their arguments based on the study and findings introduced previously, making expectations regarding the future Israeli efforts to reach its energy security.

1.3. Literature review

The Thesis builds on some literature that discussed the energy theories, energy sector in Israel, the East Mediterranean, and the Middle East. The **“Oil and the Arab-Israeli Conflict, 1948-63”,** a book was written by Uri Bialer in 1999, presents a historical introduction about Israel's energy relations after its establishment. The author studies the developments in energy relations at the critical time of state life, especially its ties with Iran. He describes this energy relation with Iran as breaking and avoiding the Suez Canal's Egyptian control (Bialer, 1999, p. 176). The Thesis relies on this book to explain Israel's efforts in the first decade of its existence to guarantee a daily oil supply. Additionally, the Thesis benefits from the book’s analysis of mutual relations between Israel and energy players, clarifying Israel's activities to protect its oil supply. Overall, this book supports the Thesis by historical realities of Israeli behavior to secure its energy needs, especially in the critical war periods.

In this regard, **‘Crude Peace: The Role of Oil Trade in the Israeli-Egyptian Peace Negotiations.’** paper was written by Ziv Rubinovitz and Elai Rettig and published in International Studies Quarterly in 2018 titled Rubinovitz and Rettig answer the questions about Israeli behavior in preparing peace with Egypt and how it guaranteed its energy security despite relinquishing Sinai’s oil fields and facing the Iranian embargo policy. This paper assists the Thesis by explaining the oil or energy role in shaping the Israeli Egyptian agreements in the 1970s, reflecting on their future relationship. The importance of this paper is coming from the declassified documents which described the secret deal and negotiations. It is an assisted thesis analyzing the importance of energy supply reliability to realize the peace and cooperation in Israeli thinking and tell how Israel sees positive peace compared to end wars only. This paper supports the thesis argument that Israel needs to live in a healthy region with its neighbors.

Gawdat Bahgat, on the other hand, wrote an article in Israel Affairs Journal in 2014 titled **'Alternative energy in Israel: opportunities and risks',** this article describes the decision-making process in Israeli institutes that shape the energy plans and goals, especially RE plans in the 1970s until the transformation after gas discoveries. Meanwhile, Bahgat makes an overview of EEZ determination to facilitate the exploitation efforts. He explains Israel's activities and negotiations to cover all EEZ disputes without reaching a complete settlement (Bahgat, 2014, p. 6). Besides, Bahgat presents, in **'Israel's Energy Security: Regional Implications',** was published by Middle East Policy Journal in 2011, the initial discussion about what is later known as the EastMed project, he mentions Netanyahu offers to supply natural gas to Greece since Leviathan discovery (Bahgat, 2011, p. 29).

On the other hand, Bahgat wrote an essential article in the Middle East Israel affairs Journal 2010 about '**Israel's energy security: the Caspian Sea**,' where he examines Israel's efforts to secure a new supply chain of energy from the Caspian Sea through Turkey (Bahgat, 2010, p. 410). In this article, Bahgat also discusses Israel's response, after its new gas discovery, in modifying its energy laws and policies, especially in privatizations (Bahgat, 2010, p. 408). Bahgat's article answers the questions about

Israel's response to meet its energy needs, although its insufficient energy resources via multiple policies and projects. Besides, his articles explain Israeli plans to utilize alternative energy to compensate for its inadequate resources and modify laws and regulations for the promotion of the rise in energy demand and meet energy diversification.

In this context, the '**Energy Economy Objectives for the Year 2030'** report was published by the Ministry of Energy in Israel, introducing 2018 plans approved by the parliament. It describes the main national energy plans to exploit natural gas discoveries in Israel. This report's importance relies on elaborations of Israeli vision regarding the energy sector after nine years of Tamar gas discoveries. It reflects the developments in the energy sector to exploit domestic gas fields. It also covers the future plans to export the surplus based on the neighboring markets forecasting demand study.

On the other hand, Laura El-Katiri and Mohammed El-Katiri wrote about the Eastern Mediterranean gas discoveries and challenges facing this sector's development. The Thesis relies on **'Regionalizing East Mediterranean Gas: Energy Security, Stability, And the US Role**,' published by US Army War College Press in 2014, to explain the disputes offshore and the US's role to help regional players. They discuss proposals' routes to export gas to the EU and explain the difficulties of cooperation regarding Israeli-Cyprus cooperation under the sea's disputed events. They also focus on Cyprus's importance from the US vision for the Eastern Mediterranean region (El-Katiri & El-Katiri, 2014, p. 44). Furthermore, **'Geopolitics of gas and militarization in the Eastern Mediterranean'** was written by Felipe Sánchez Tapia for the Spanish institute for strategic studies in 2019 to analyze tensions and disputes in determinations EEZ, which reflects on the future gas cooperation plans. The Thesis supports its descriptions of the cooperation and conflicts in the region depending on Tapia's study. Furthermore, it assists the Thesis by explaining the EEZ concept and the international laws related.

On energy theories, Jonathan Elkind describes the energy security theory in his book section called **'Energy Security: Call for a Broader Agenda'** published in 2010. He defines energy security's components, availability, affordability, reliability, and sustainability, as the main components that a state tries in meeting its energy security. Elkind describes the economic role to meet the availability and affordability of energy upon market structure. On the other hand, he sees that the political level plays a primary role in meeting energy reliability by its foreign energy relations and development plan of energy infrastructure. Finally, sustainability is coming as a response to the climate change crisis, which helps other energy security, especially its infrastructure. This section supports the Thesis by fruitful analysis and understanding of energy security to analyze Israel's case.

Additionally, the '**Energy Security and Global Politics'** book was written by Moran Daniel Russell James in 2009, which adds for the Thesis an analysis of the strategic dimensions for energy security, particularly where energy reservoir and infrastructure have become the object of military contest. They describe the relationship between energy resources and weapon trade, terrorist groups' attacks against energy infrastructure, and Middle East energy resources as an excellent example for their theories (Moran & Russell, 2009, p. 9). In this regard, they elaborate Iraqi-Iranian war in the 1980s impact on energy supply chains and the US role to maintain the region's energy security (Moran & Russell, 2009, p. 48). On the other hand, the Thesis depends mainly on this book's elaboration about energy security, directly linked to the research question.

Furthermore, a book labeled **“Geopolitics: The Geography of International Relations”** written by Saul Bernard Cohen in 2015, introduces the geopolitics definition, features, and its relation with energy resources and supply chain. This book makes a good background of geopolitics which impacts energy relations and wars. The book's main benefit in this Thesis is a profound description of the Middle East region from geopolitical perspectives and linked that with the energy discoveries. It helps the Thesis understand the location of energy resources and their impact on meeting energy security in Israel.

In this regard, Brenda Shaffer’s article labeled as **‘Natural gas supply stability and foreign policy’,** was published in Energy Policy Journal 2013, which looks at conditions impacting natural gas production reliability. The author explains how states intervene deeply to meet international investors' energy reliability and promotion by its political relations (Shaffer, 2013, p. 116). In the Israeli market, Shaffer mentions how Israel dealt with Egyptians cut off the gas in 2012, leading to the peace treaty cancelation (Shaffer, 2013, p. 122). The article argues that only one of the factors influencing supply stability is the dominant political ties between gas trading states, supporting the thesis hypothesis. This article helps the Thesis understand the relationship between natural gas and foreign relations, mainly in Israel.

As Shaffer described the foreign relation's role in the energy sector, another study focused on this relation; **“The Impact of Natural Gas Discoveries on Israeli Politics, Socioeconomic Discourse, and Regional Perception”** was prepared by Elai Rettig in 2016. Rettig studies some economic impacts of energy discoveries in Israel. Also, Rettig sees the new challenge to protect the gas reservoir in Israeli offshore, which affects the weaponization policy and priorities. The author assures states’ role to meet energy reliability and defines Israeli efforts in the EasMed pipeline (Rettig, 2016, p. 4). The Thesis benefits from this study to explore how Israel is affected by energy discoveries at economic and political levels and elaborate the regional development concerning the new interests in their shared offshore.

The Israeli security system has a role in the energy sector; the Thesis relies on a study prepared by Gadi Eisenkot and Gabi Siboni in 2019, which is called **'Guidelines for Israel's National Security Strategy'** published by the Washington Institute for near east policy. This report's importance comes from the authors; Gadi Eisenkot, a former chief of the Israel Defense Forces General Staff, and the military expert Gabi Siboni. They answer main questions about threats, challenges, and Israeli security recommendations under new developments in the region and worldwide—the thesis studies modern Israel's threats on the energy sector and discoveries. Besides, depending on this study, propose principles to deal with them for a comprehensive energy Israeli security strategy. This study assists the Thesis profoundly by practical analysis of theories that build the Israeli security system, geopolitics, and energy topics. Understanding the Israeli security system in the energy sector cannot be complete without understanding the liberalism theory. In this context, the Thesis takes Cornelia Navari's elaborations about **Liberalism** in the '**Security Studies**' book which was published by Routledge in 2008. The Thesis builds on Navari descriptions to study the Israeli peace process and how it shapes energy relations with its enemies and friends.

Finally, **Shadi Ewida's** book **'Natural gas exploitation in the Eastern Mediterranean basin and its impact on the Israeli influence in the region'** was published in 2019, and is originally a master thesis. Ewida explains Egypt's role in exploiting Israeli energy discoveries; he sees it as a cornerstone from the Israeli perspective, significantly depending on the Egyptian experience and infrastructure in natural gas (Ewida, 2019, p. 12). In addition, the author mentions Israeli policy in new dimensions of weaponization after gas discoveries, especially in naval forces, to protect its new infrastructure against any threats. The Thesis uses the book's explanations to examine Israeli gas discovery in the Eastern Mediterranean and the possibilities of power use versus cooperation relations. Additionally, the Thesis depends on Ewida analysis of these discoveries' effect on Israel and Arab-Palestinian roles, analyzing Israel's gas discoveries and future expectations.

2. Israeli energy sector before 2009

This chapter reconstructs the complexity of Israel's energy relations as an energy importing country before main natural gas discoveries in 2009. It will be divided into five sections; the first section answers the questions about how these relations changed over time and players since the state's establishment until the Six-Day war in 1967? These relations changed until Israel and Iran agreed to long-term contracts, which helped Israel avoid the Suez Canal Egyptian control. The second section discusses the effect of the Six-Day war in 1967 on the energy sector that made Israel a self-sufficient energy country and how Israel dealt with the October War in 1973 and the Arabs oil embargo on Israel's energy sector.

The third section studies the United States' intervention to facilitate the peace process with Egypt by guaranteeing Israel's energy security. It sheds light on the development of energy relations after the Camp David peace agreement in the 1970s and mainly with Egypt, which was synchronized with the Iranian Shah collapse in 1979. The fourth section focuses on the new age after the Soviet Union collapsing, reshaping Israeli energy relations, and reconsiders Turkey's position as an energy transit for Israel. Finally, the fifth section studies the modest natural gas discoveries in Israel and Palestine offshore. It introduces an energy transition in Israel, which strengthened after starting Egyptian gas import in 2008. This initial gas transition helps Israel enter as an energy player in the region before discovering substantial natural gas fields after 2009.

2.1. State Establishment; Energy Poverty in Rich Region

The object of Haifa's oil refinery plant, which was constructed under the British mandate of Palestine and took place in 1947, was for refining the Iranian and Iraqi crude oil reaching Haifa via the Kirkuk-Haifa pipeline. But after the British mandate ended and Israel's establishment, the Kirkuk-Haifa pipeline was cut off by Arab countries as an embargo policy toward Israel (Shaoulian-Sopher, 2017, p. 143). That forced Delek Oil Company, a new Israeli national oil company, to ship Kuwaiti import oil via English developers before it was stopped for maintaining good relations with Arabs. Then, it was replaced by importing the expensive oil from Venezuela (Missiroli & Genna, 2019, p. 128).

This complex energy situation, created by Arab neighbors, enforced Israel to find sustained and affordable energy resources. By the mid-1950s, Israel studied to purchase Iranian oil. Still, under Iran's political instabilities and disorder Israel eschewed making a contract with Iran and headed to the Soviet's oil supply plant (Shaoulian-Sopher, 2017, p. 143). The Israeli government also increased its import from the Soviet Union in 1954 by three times to reach 45% of Israel's total energy consumption (Missiroli & Genna, 2019, p. 129).

This situation was changed after the Iranian Shah controlled full authority and returned the political stability in Iran. Directly, Iran sold 75,000 tons of crude oil in 1955-1956 via a proxy company to avoid Arab oppositions that made a historical precedent of importing the Iranian oil to Israel and bypassing the Egyptian Suez Canal. From these moments, Iranian oil was the primary source of Israel for two decades, crowned by a secret agreement in 1957 to sell Iranian oil to Israel at a competitive price. In this regard, the new oil pipeline was built from the Eilat port to Beersheba in 1957 to carry the Iranian oil to Haifa’s refineries and Europe. Consequently, Iranian oil was doubled to Israel when the pipeline construction was completed at the end of 1960 (Shaoulian-Sopher, 2017, p. 145).

By the time Iran verified to be a reliable energy partner for Israel during the 1960s-1970s, which figured by supplying up to 85%, at the peak, of Israel's total oil consumption (Rubinovitz & Rettig, 2018, p. 5). The Soviet's short contract's transformation to long-term relations with Iran depended on different reasons, such as Iranian oil's price stability, is linked to the international market, Iranian oil would be persistently cheaper. Furthermore, Bialer described this transformation as "the important objective of breaking the Suez Canal blockade" by using the Iranian oil tankers reflected strategically in Israel (Bialer, 1999, p. 176).

2.2. The Six Days War: Sinai as Oil Resources

As a result of the Six-Day war in 1967, Israel occupied the Sinai Peninsula, Golan Heights, and West Bank, but the major Israeli step from energy perspectives controlled the Sinai oil fields. Israel used these fields to supply 55% of its Israeli domestic needs. On the other hand, that affected the Israeli treasury by saving $350 million as a hard currency that may cost oil imports (Bahbah, 1982, p. 115). From the early 1970s, Israel changed from an importer to a self-sufficient oil country, in which two oil refiners assisted Haifa and Ashdod (Bahgat, 2010, p. 408). In 1977, under peace negotiations, including the Sinai oil fields' relinquishment, Israel discovered the offshore oil field called the Alma field (Rubinovitz & Rettig, 2018, p. 6). Sinai oil fields will be part of the complex peace negotiations between Egypt and Israel later.

On the other hand, Iran's energy relations consolidated rather than weakened after Israel's oil independence. The Six-day war resulted in blocking the Suez Canal for all transportations, including oil shipments. This challenge triggered the Israeli official to exploit their new geopolitical position. Israeli Finance Minister, Pinchas Sapir, met the Iranian Shah three months after the 1967 war. The Israelis' objective was to assist Iran exporting by building an additional oil pipeline to increase oil capacity in the Eilat to Ashkelon channel and bypass the Suez Canal plant (Shaoulian-Sopher, 2017, p. 249).

This pipeline length is 260 km with an annual transporting capacity of 60 million tons of crude oil, which was completed in the last 1969 (Shaoulian-Sopher, 2017, p. 250). It was called as Trans-Asiatic pipeline, Tipline, or Eilat-Ashkelon pipeline. This pipeline's operation helped Israel need and supply Iran's European customers (Shaoulian-Sopher, 2017, p. 250). As an energy-independent country, this new position would have been a temporary period since Israel did not continue its Sinai occupation. In mid-1973, the new refinery in Ashdod port was completed and, together with Haifa refinery, could deal annually with more than 10 million tons of crude oil (Bialer, 1999, p. 246). Consequently, the energy infrastructure development in Israel is assisting it for strategic purposes.

Figure 1: Gulf of Aqaba importance in Israel Geopolitical situation (Lerman & Teitelbaum, 2016)

After triggering the October war in 1973, Arab Countries at the Organization of the Petroleum Exporting Countries OPEC made an oil Embargo against Israel mainly and its supporters to use the oil as a pressure tool to meet the Arabs war objectives and officially, Iran joined this embargo and cut off the oil on Israel. Despite this official stand, Iran continued its supply to Israel via a proxy Jewish businessman at the Israeli oil price, which made the 1973 energy crisis softer (Shaoulian-Sopher, 2017, p. 239). Additionally to the embargo, the Egyptians prohibited Iranian oil imports to Israel by making a blockade of the Bab el-Mandeb Strait; Israel was forced to use the long route of Iranian shipments to avoid the Egyptian block in the Red sea (Bahbah, 1982, p. 118).

After the 1973 war, Iran promised the US of continuity oil supply to Israel regardless of any future embargo announcement (Tanribakan, 2009, p. 28). The US intervention in the region was translated to a secret guarantee to Israel; the US signed in 1975 a Memorandum of Understanding with Israel to ensure the US commitments, especially about Israel's energy needs for five years. The US was committed to giving all efforts to cover Israel's “energy requirements and to its economic needs” and assured that the US would "promptly make oil available for purchase by Israel” (Bahbah, 1982, p. 116). Furthermore, Israel expanded hugely the oil storage capacities, which was considered a different response to any future embargo or emergency similar to what happened in the October War (Bahbah, 1982, p. 119). This war has shown Israel the reality that the Israeli energy supplies are not sufficient in wartime without an external player to maintain the Israeli energy stability, which was enlightened by the US 1975 guarantee.

2.3. Camp David and Shah Collapse

At the beginning of 1978, Israel persuaded Mexico to raise oil exports to meet energy supply diversification, which covers one-fifth of Israel's consumption (Bahbah, 1982, p. 120). This resource diversification policy put Israel on the right way; in 1979, Iran carried out an unexpected oil embargo on Israel after Shah's collapse after the Islamists controlled the regime. This embargo means that Israel lost 60% of its oil needs, and Iran objected to exporting oil to Israel by any third party (Tanribakan, 2009, p. 28). In this severe event, the US applied its energy guarantee for Israel based on the 1975 agreement by preparing to export US domestic crude oil to Israel. (Bahbah, 1982, p. 120).

In this regard, Israel faced multiple energy challenges; the Iranian oil embargo cut off over 60% of Israeli energy needs. Moreover, when Israel was in the last steps to ink the Camp David peace agreement with Egypt, where Israel would have relinquished the Sinai oil fields, which considered more than 20% of its consumption, yet Egypt rejected the long-term energy contracts with Israel (Bahbah, 1982, p. 123). In order to facilitate the peace agreement and avoid a possible deadlock, the US offered the chance to revise and extend the 1975 agreement with Israel for another 15 years, which occurred by signing a new US-Israeli Memorandum of Agreement in March 1979 (Bahbah, 1982, p. 123). The US role would approve the external player's importance in securing Israeli energy needs; Israel did not accept to continue in the peace process without this external player role again.

After 1980, Israel returned as a fully energy-dependent country. On the other hand, in early 1980, Israel made an energy transition using coal instead of oil in electricity generation. By the year 2000, coal represented 70% of electrical energy produced in Israel (Popper, 2009, p. 11); the significant coal exporting countries to Israel are South Africa, Australia, the US, and Poland (Sachs & Boersma, 2015, p. 3). In this context, the diversification policy was not only in the resource country, but it depended on the diversification of the energy resources type affected by the energy infrastructure and electric power plants. In 1984, the significant share of oil import was 40% from Mexico, 32% from Egypt, 9% from Norway. This figure changed in 1994 to be 31% from Egypt, and the new importer country was Gabon/Congo with a 10% share of oil import. While the coal importing share was 56% from South Africa, 18% from Colombia, 14% from the US, and 9% from Australia (Bialer, 1999, p. 247). The oil's share in the Israeli energy market decreased radically by importing Coal after the Iran embargo.

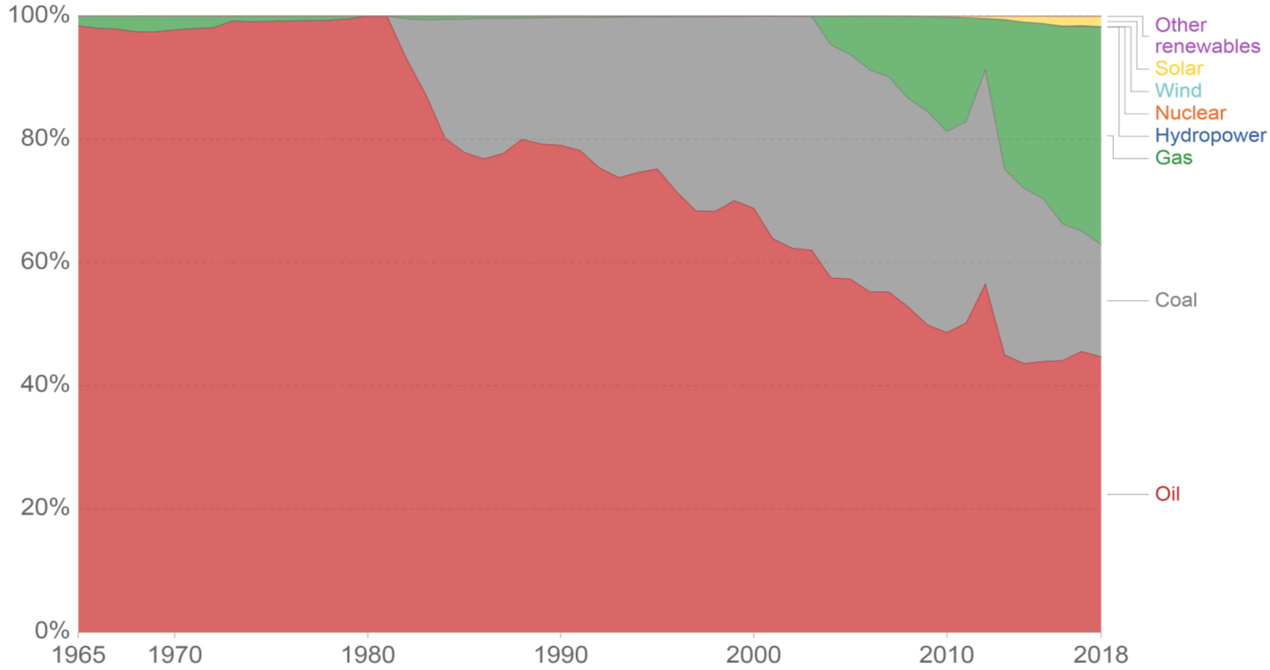

Figure 2: Energy Consumption by Source in Israel 1965-2018 (Data, 2020)

2.4. The collapse of the Soviet Union and Turkey Energy Hub

The collapse of the Soviet Union was a turning point in Israeli energy relations and made the energy supply stable again after the Iranian shah collapse. The emerged independent former Soviet states, especially in the Caspian region with massive energy reserves, appeared as new energy resources worldwide, including Israel (Tanribakan, 2009, p. 30). In this regard, Israel started to increase its energy imports from ex-Soviet states to reach almost 80% of its oil imports (Tanribakan, 2009, p. 76). Russia and Azerbaijan were significant energy importing states to Israel using the Turkish paths and straits. As a result, Turkey would play an essential role in supplying energy to Israel. Turkey's role will be more stable than the Iranian option, although the AKP party, a conservative party elected in 2002, has not negatively affected their energy relations. On the contrary, it expanded and continued its energy relations.

In this context, two main infrastructure projects were implemented to facilitate Caspian energy-exporting (Bahgat, 2010, p. 410). The main one was Baku–Tbilisi–Ceyhan pipeline BTC runs to reach Turkish port Ceyhan from Azeri capital passing through Georgian Capital Tbilisi. Israel has continuously been part of the BTC pipeline project from planning to the commission in 2006 (Tanribakan, 2009, p. 56). The Israeli-Azeri partnership translated to consolidate countries relations in multiple sectors, Israel turning from tenth-largest trade partner of Azerbaijan to be in the fifth only from 2000-2005 (Tanribakan, 2009, p. 45). With a focus on the Russian side, the Israeli prime minister, Ariel Sharon, visited Moscow and expressed with his counterpart to support the future projects to export Russian gas to Israel via Blue Stream pipeline under Black sea waters using Turkish infrastructure (Tanribakan, 2009, p. 53).

Figure 3: Caspian Energy States and Turkish Corridor to Israel (Cohen & DeCorla-Souza, 2011, p. 2)

Figure 4: BTC pipeline that carries Caspian oil to Israel via Ceyhan port, and Kurdish route to Ceyhan (Cohen & DeCorla-Souza, 2011, p. 2)

2.5.Natural Gas Transition

Energy transition in Israel happened in the 1980s when it decreased oil dependency and used coal instead. At the dawn of the new century, Israel started to use natural gas in its energy basket, which began gradually by discovering modest natural gas reserves in Palestine-Gaza offshore. The first natural gas discoveries have happened in the offshore Gaza strip. The Palestinian Authority awarded an exploration license to the British Gas BG international company in the last of 1999, crowned BG discovery of a significant natural gas field called Marine-1. This field is located in Palestinian territorial waters with about 15 miles distance from offshore Gaza. In this regard, there were hopes to exploit this field to meet Palestinians' energy needs and surplus amounts for export if it existed (Bahgat, 2010, p. 409). However, the Israeli-Palestinian peace process's failure has negatively impacted executing any actual development of Gaza resources for the domestic or exporting market.

On Israel's side, in 1999 and 2000, a significant volume of Natural Gas was also discovered in southern Israel's offshore, mainly in two fields – Mari and Noa, the Yam Tethys fields (Bahgat, 2010, p. 409). To exploit these new and promising discoveries, the Israeli government proposed the Natural Gas Market Law in 2002. The law opens the door to facilitate the natural gas industry development by permitting private sector investments and foreign investors. The law also established the Natural Gas Authority to regulate the developing efforts and related activities in the market. Moreover, Yam Tethys fields were considered a small portion in the Israeli Electric Company IEC's energy basket, a state company, and large industries such as Israel Chemicals and Cement (Bahgat, 2014, p. 4). Also even though these new discoveries are used on a small scale, Israel is still an energy-dependent country.

After the offshore discoveries in Gaza and Israel, there were other discoveries in Egypt's offshore water with a commercial capacity for exporting. Egyptian findings led to signing a fifteen-year contract in 2005 obligating that Egypt exports natural gas to Israel by a submarine pipeline from Egypt offshore to the southern Israeli coastal city of Ashkelon passed through El-Arish. This step was considered ‘historical’ as referred to by the Israeli Minister for National Infrastructure Benjamin Ben-Eliezer's declaration (Bahgat, 2010, p. 413). The project was in operation since 2008, which was interrupted many times due to instabilities and disorder in Sinai. Israeli policymakers considered this agreement as a proven tool for sustaining the peace situation with Egypt, which translated to an increase in the Egyptian natural gas share in the importing gas basket that reached 40% of Israel's natural gas consumption in 2010, mainly used for electricity generation (Shaffer, 2013, p. 121).

In addition to Israel, another consumer benefited from Egyptian gas, the Jordanian electricity company. The pipeline separates into two branches at El Arish city: one to Israel and another to Jordan. At that time, Egypt yearly produced about 65 Billion Cubic Meter BCM of natural gas, whereas 45 BCM was consumed in the Egyptian domestic market, while the 20 BCM was exported (Shaffer, 2013, p. 121). Furthermore, the importance of constructing an Egyptian natural gas pipeline and importing it is putting Israel on the rail to prepare for the giant incoming discoveries after 2009.

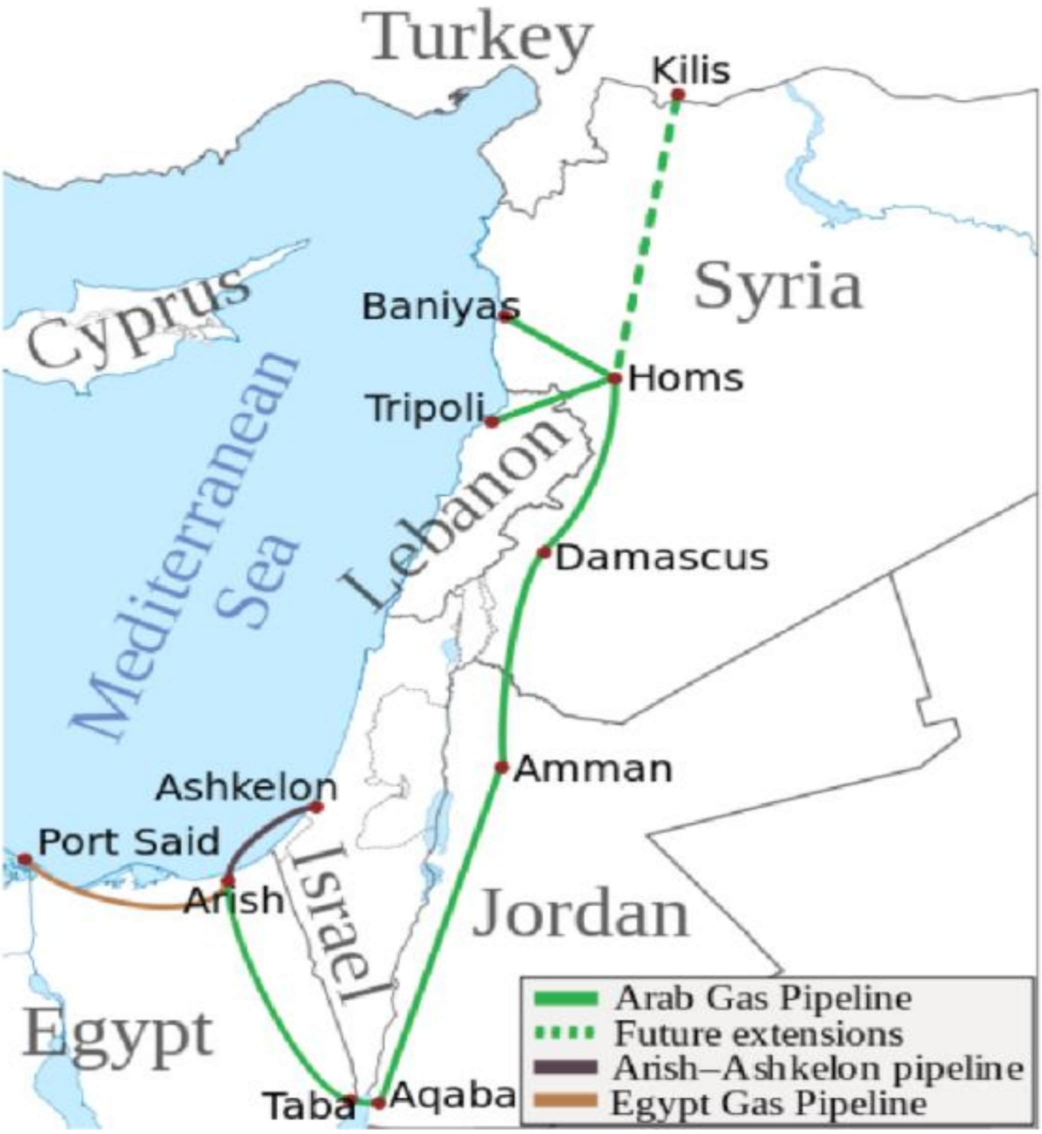

Figure 5: Gas pipelines in Eastern Mediterranean region (Anon., 2012, p. 67)

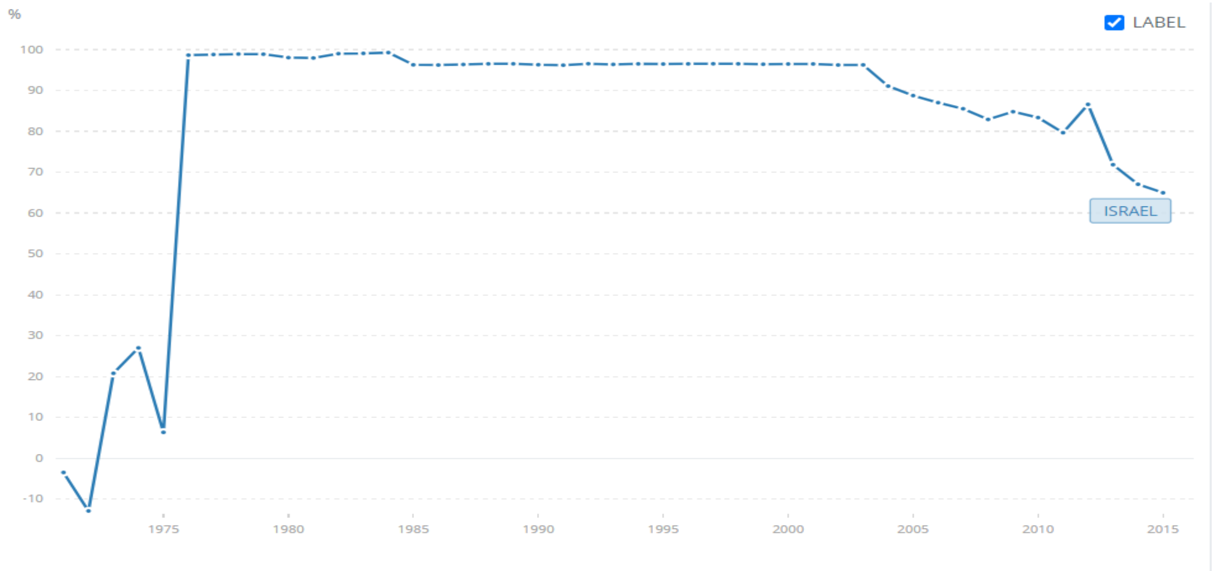

Figure 6: Energy import in Israel 1965-2015, increased import after relinquished occupied Sinai oil fields, decreased after domestic gas discoveries (WorldBank, 2016)

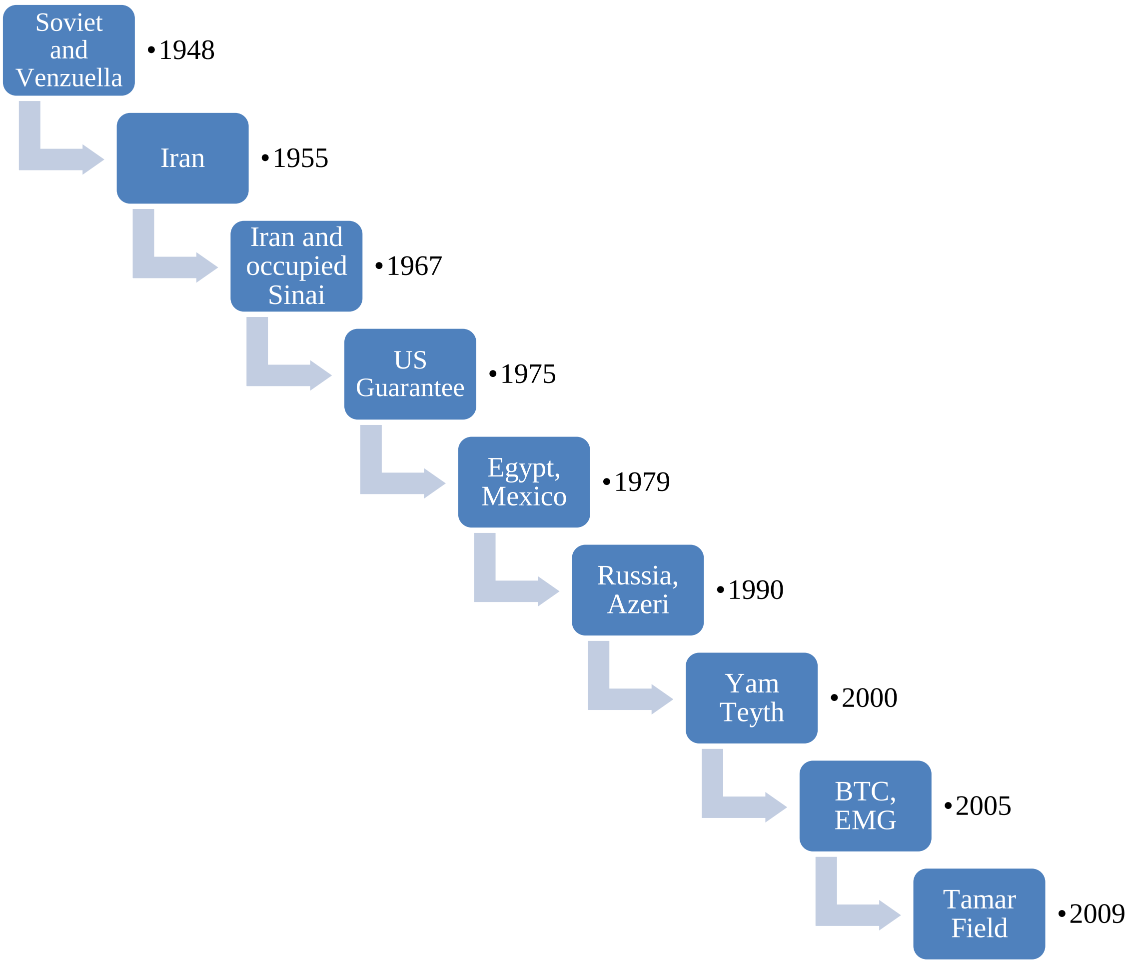

Figure 7: Energy map relation and milestones in Israel over before gas discoveries

3. Israel gas discoveries after 2009

In the first decade of the 21st century, Israel entered a new age in energy diversification. It was clear that Israel was heading to increase the natural gas consumption in its energy mix. On the other hand, Israel possessed the nuclear infrastructure for military purposes, not for energy production. Meanwhile, Israel planned to adopt a nuclear energy power plant with neighboring countries, which Israeli Infrastructure Minister Uzi Landau announced in 2008. The proposed project was a joint project with Jordan, but the Jordanians rejected going ahead without resolving the Palestinian question. One year later, the Fukushima nuclear accident happened; a nuclear crisis struck Japan after a main earthquake and tsunami triggered nuclear explosions and rising radiation levels. Israeli Prime Minister, Benjamin Netanyahu, declared that Israel is reassessing its plans about a nuclear power plant as a response to what happened in Japan (Ravid & Rinat, 2011), making Israel focus on the natural gas transition as the primary option in the energy sector.

This chapter will study the natural gas discoveries after 2009 in Israel in six sections; the first section reviews 2009 gas discoveries in Israel, their capacities, locations, and the government's hopes to exploit them. The second section discusses Israeli policies and strategies regarding the energy sector to benefit from new discoveries, mainly by increasing domestic demand from natural gas and reformation in related laws and regulations. The third section explains the economic reflection of these energy developments. It examines domestic issues more than Israeli foreign relations to understand the Israeli energy market and economy before studying Israeli energy relations after new energy.

The fourth section analyzes Eastern Mediterranean energy infrastructure and the position of Israel as part of this region. The section explains the complexity in integrating infrastructure developments due to political tensions and conflicts, focusing on water boundaries conflict. Furthermore, it covers other regional gas and oil discoveries in different states. While the fifth section introduces how Israel reached export policy upon a vast surplus of natural gas reservoirs? It also discusses Israeli proposals to export gas through multiple routes and challenges to implementing them; the main options are Asian, East Mediterranean, and European. The sixth section explains the EastMed project to supply gas for the European market and the conflict-related to other regional conflicts, especially Turkey. Finally, it focuses on leading international players in shaping the future of gas discoveries in Israel and the region.

3.1. 2009 Gas Discoveries

The Egyptian natural gas imported in 2008 counted about 40% of Israel's gas consumption. The rest percentage was covered by the Yam Tethys reserves domestically. Step by step, Israel increased its dependency on natural gas as new energy resources, which share less than half of its total electricity generation by 2010 (Wurmser, 2013, p. 5). This transformation happened only in less than five years. Furthermore, referring to diversification policy, in June 2009, Israel published a prequalification tender for the building of a liquefied natural gas LNG terminal in Ashkelon port to benefit from growing LNG suppliers worldwide (Cohen & DeCorla-Souza, 2011, p. 5). This terminal has not been constructed since Israel will be changed from an energy importer to an exporter country, whereas the transformation happened in the same year.

After more than sixty years of attempts, Israel has a real ambition to change its energy position. In early 2009, Israel announced the most extensive ever natural gas reservoir located offshore Haifa named Tamar. Tamar discovery was made through a US–Israel consortium, mainly Noble-Delek Companies. In this regard, Tamar production was projected to meet Israel's natural gas growing demand for the next 15 years (Bahgat, 2010, p. 409.). Tamar's capacity was estimated at 246 BCM. On the other hand, another discovery of Dalit's small field with an estimated capacity reached 7–14BCM (Teff-Seker, et al., 2018, p. 617).

Tamar was the first step in the transformation by the end of 2010; another significant gas discovery was made on Haifa offshore southwest of Tamar. This new discovery was named Leviathan. It will be one of the largest deep-water gas discoveries in a decade worldwide (Bahgat, 2011, p. 29). Israeli Prime Minister, Netanyahu, described these discoveries: "God gave us gas that will turn Israel into an energy power" (Rettig, 2016, p. 2). Moreover, an Israeli official said that their dream translated to be real. In 2012, Israel increased its natural gas reserves by discovering two other fields, Karish and Tannin, with a combined estimated capacity of 80BCM (Teff-Seker, et al., 2018, p. 617). These discoveries continued with some small and medium capacities, but the Tamar and Leviathan are the majors for commercial use domestically and for exporting (see table 1).

Table 1: Israel gas Resources Estimations (Herzog, et al., 2017, p. 85)

	Resources (BCM)	Remaining Reserves	Discovered	First Gas	Water Depth (meter)	Category	Operator
Tamar	310	275	2009	2013	1,700	2P	Noble
Leviathan	621	621	2010	2020	1,650	2C+2P	Noble
Karish /Tanin	67	67	2012-2013	2020	1,750	2C	Energean
Noa / Mari B	25	<3	1999-2000	2004	250	2P	Noble
Dalit	15	15	2009	-	1,500	2C	Noble
Shimshon	5	5	2012	-	1,110	2C	AGR/ Isramco
Total	**1,046**	**983**					

On the other hand, the Egyptian gas agreement with Israel faced many public Egyptian protests (El-Katiri & El-Katiri, 2014, p. 33). This event was interactive with other internal Egyptian political events after the Egyptian revolution in 2011. Many attacks targeted the natural gas pipeline in Sinai, which made gas supply interruption in Israel. During the attack period, the new regime in Egypt, under this public pressure, reviewed the terms of the gas contracts with Israel and Jordan. In April 2012, Egypt eventually canceled the gas agreement with Israel.

Egyptian cut off the supply in 2012 synchronized with a hot summer that put Israel in a critical energy position and was forced to use high prices energy substitutes (Sachs & Boersma, 2015, p. 2). Meanwhile, the Israeli gas fields were in depletion status or not developed yet. Cohen and Korner described that situation as necessary: “the consumers were highly dependent on the supplies, while the supplier was not dependent at all and had difficulty in producing the gas for export without cutting domestic supplies” (Shaffer, 2013, p. 122). This natural gas crisis in Israel was a significant event, it was not only affected by energy security issues, but it also affected the balance of hard foreign reserves. The US dollar amount used for Israeli energy imports increased to $16 billion in 2012 to compensate for the Egyptian gas shortage (Cohen & Korner, 2016, p. 10).

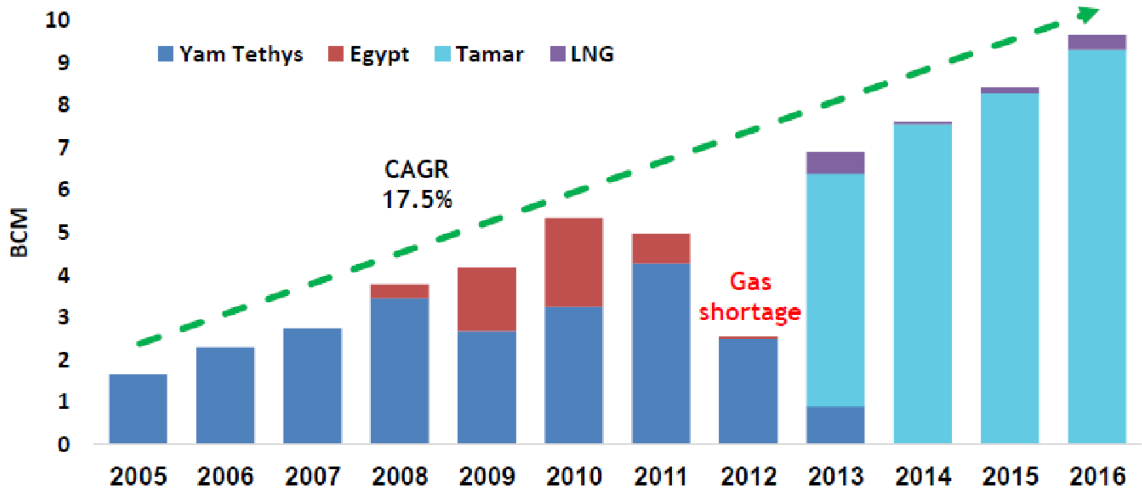

Figure 8: Israel natural gas consumption by gas supplier 2005-2016 (Herzog, et al., 2017, p. 6)

Israel continued its quick response to these energy interruptions. After less than a year of Egyptian gas agreement terminations, a sea terminal was constructed off the Hadera coast to import liquified natural gas (LNG); this will serve as a backup to any gas supply shortage in the future. From April 2013 onwards, Tamar field was the primary source of natural gas for the domestic market, which provided 40BCM until the end of 2017 (Energy, 2018, p. 12). Therefore, directly after Tamar discovery, the field's developer inked an agreement with the Israeli Electric Corporation to supply natural gas for 15 years with higher than the market price, which local opposition condemned and led to review the contract and passed it later (Nathanson & Levy, 2012, p. 38). Under its current consumption circumstances, it was expected that the domestic Israeli market could mainly be covered by Tamar for the next 20 years at least. Still, it needed the proper infrastructure to be developed (Cohen & Korner, 2016, p. 6). In less than one decade, Israel transformed from the energy dependency status to be energy self-sufficient, which will lead the energy policies and strategies to exploit these fields efficiently and reflect that on the Israeli economy.

3.2. Effect on energy policies and strategies

Under the new development regarding the natural gas discoveries and interruption of Egyptians as supply, Israel deployed new energy policies to mitigate these new challenges and benefit from the new energy developments. The Israeli energy independence strategy focused on four dimensions; the first is adopting renewable energy RE and energy efficiency EE projects. The second dimension decreases dependency on coal for electricity production, whereas the third dimension is the expansion of electrification in the transportation and industrial sectors. The final dimension is increasing the domestic demand for natural gas, mainly for electricity production. A privatization policy for energy entities that preceded these policies started in two refineries in the mid-2000s to meet the competition requirements and increase sector efficiency (Bahgat, 2010, p. 408). In Israel, access to electricity covers almost all of the total population (Data, 2020), whereas the electricity demand growth in Israel is 4% annually during 1997-2017 (Herzog, et al., 2017, p. 16).

The Israeli energy sector's stakeholders were divided into different ministries and governmental entities responsible for formulating and adopting the energy policies. The first stakeholder is the Ministry of Energy. It is the main stakeholder responsible for the natural resources and energy economies of fuel, electricity, cooking gas, renewable energy, energy efficiency, natural gas, oil exploration, minerals, water, sewage, earth, marine, and others for research and development. The Ministry also promotes natural resources' intelligent and efficient utilization, ensuring long-term sustainability and proper preparation against natural risks (Energy, 2020).

The second stakeholder is the Ministry of Finance that plays the leading role in allocating the required financial resources and participating in selecting and cooperating with investors. The other stakeholders conclude that the Ministry of Environmental Protection plays a significant role in environmental issues and fighting climate change. Whereas the Israel Lands Administration manages all state-owned land, and the Public Utilities Authorities (PUA) sets electricity tariff rates and licensing issues. (Bahgat, 2014, p. 14). These various stakeholders may lead to a bureaucratic delay in the energy plans and projects. The Office of the Prime Minister takes the team-leader position to coordinate the policies between them. Furthermore, the Prime Minister's Office, in coordination with the Knesset, Israeli Parliament, among others, in particular, the Ministry of Finance formulates and adopts tax policies relating to the energy sector (Bahgat, 2014, p. 14).

For promoting the private and foreign investors, an Israeli parliament committee headed by Eytan Sheshinski, an economist professor at Hebrew University, founded in 2010 to study the tax issue and propose proper modifications. The Committee recommendations were released in earlier 2011 with suggestions to increase Israel's oil and gas share revenues from the current 30% to be between 52% and 62%. In March 2011, the Israeli parliament made legislation approval on the committee's recommendations. Mainly for sector reform and modification of a 1952 law. This law made the best perks for energy companies in tax worldwide (Bahgat, 2014, p. 5).

At that time, Steinitz, a finance minister, estimated the annual return from these new taxes is one billion shekels for the next 30–40 years after 2015 (Bahgat, 2014, p. 6).

These recent amendments were thanks to a Sheshinski committee to avoid Noble-Delek, the leading developer of Tamar and Leviathan gas fields, market monopoly, and gain more compensation for Israeli gas fields (Teff-Seker, et al., 2018, p. 618). Furthermore, the gas revenues are used to consolidate the energy plans, particularly in electrification policies. Indeed, the cost saved from non-importing oil or coal helps construct medium and small-sized gas electricity power stations (Cohen & Korner, 2016, p. 25).

Traditionally, Israel was suffering from inadequate and insecure energy resources, one of the pioneered states set to adopt Renewable Energy RE technologies since the 1970s (Bahgat, 2014, p. 12). This new approach has been regulated since the 1980s. In general, solar thermal energy is the primary source of residential water heating, with about 85% of Israeli's houses implementing solar water heating systems (Bahgat, 2014, p. 12). Before gas discoveries, Israel formulated in 2002 a new strategy by setting a national energy goal to reach 5% RE in electricity generation mix by 2016.

In 2009 Israel made a revised decision to reach 5% renewable energy generation by 2014 and 10% by 2020. These new targets were supported by a 2010 plan to generate 10% renewable sources of electricity and spending $600 million until 2020 (Bahgat, 2014, p. 12). Despite these plans and targets, the RE share was approximately zero percent of the energy mix until 2010, but it increased in 2019 to be above 4%. Israel has accepted RE targets to be at least 17% of total electricity generated in 2030. Referring to the New Implementation of The Sustainable Development Goals report published by the Israel Ministry of Energy in 2019, Israel faces a different challenge regarding RE projects, one of those challenges linked to land availability to implement it in densely populated Israel (Katz & Elkin, 2019, p. 138). On the energy efficiency side, significant developments have been executed since 2010. The total primary energy consumption per capita has dropped by about 13% from 2000 to 2016. In the 2019 plan, Israel has committed to reaching a 17% reduction in national electricity consumption by 2030; this was compared to the predicted electricity demand in a business-as-usual behavior (Katz & Elkin, 2019, p. 139).

On the coal resources, Israel adopted coal electricity generation for base-load production since the 1980s. After the increase of natural gas supply and domestic fields, the Ministry of Energy ordered the electricity utility in December 2015 to decrease coal usage by 15%. It changed that to 19% by 2017, reducing harmful emissions and increasing generation by natural gas sequentially. The consultant's forecast was submitted to the Ministry of Energy, assuming that the next step of coal reduction will occur after Leviathan's market operation stage in 2020. There will be sufficient natural gas resources (Herzog, et al., 2017, p. 20). On the international obligation side, Israel declared its objective in the 24th Conference of the Parties to the UN Framework Convention on Climate Change COP 24 to be coal-free by 2030. Israel has set an operational regime to enable GHG emissions reduction per capita by 17% in 2030, which frees it from using Coal (Herzog, et al., 2017, p. 21).

Table 2: electricity demand forecast summary 2015-2040, electrification in rail and electric cars (Herzog, et al., 2017, p. 19)

	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040
Residential	3.2%	3.9%	4.2%	3.7%	3.0%
Commercial & Public	3.3%	3.8%	3.9%	3.7%	3.3%
Industry	2.8%	2.6%	2.7%	2.4%	2.1%
Agriculture	2.0%	2.1%	2.4%	2.6%	2.6%
Water & Desal.	4.7%	4.9%	3.9%	3.0%	2.5%
Rail Electrification		16.8%	7.0%	4.6%	4.0%
Electric Car		19.4%	19.0%	5.6%	3.5%
Israel Total	3.5%	3.8%	4.0%	3.4%	2.9%
Palestinian	5.2%	5.8%	8.5%	8.5%	8.5%
Total Including Palestinians	3.6%	4.0%	4.5%	4.1%	3.8%
Israel Per Capita	**1.6%**	**1.9%**	**2.1%**	**1.6%**	**1.2%**
Palestinians per Capita	3.2%	5.8%	5.8%	5.8%	4.6%

In this context, the leading sector that can utilize the domestic natural gas reserves is electricity generation. Additionally, a building gas power station is considerably less expensive than a coal station and occupies a smaller area (Even & Eran, 2014, p. 192). The new policy also approved the construction of combined cycle power stations CCGTs utilized the gas. (Cohen & Korner, 2016, p. 5). The electrification policy in different sectors will serve the gas by creating a stable gas demand in electricity production. It was forecasted that domestic gas consumption would grow by 8% in the average annual base over the next decade from 2017, meeting 14BCM by 2020 and 20BCM by 2025 (Herzog, et al., 2017, p. 11).

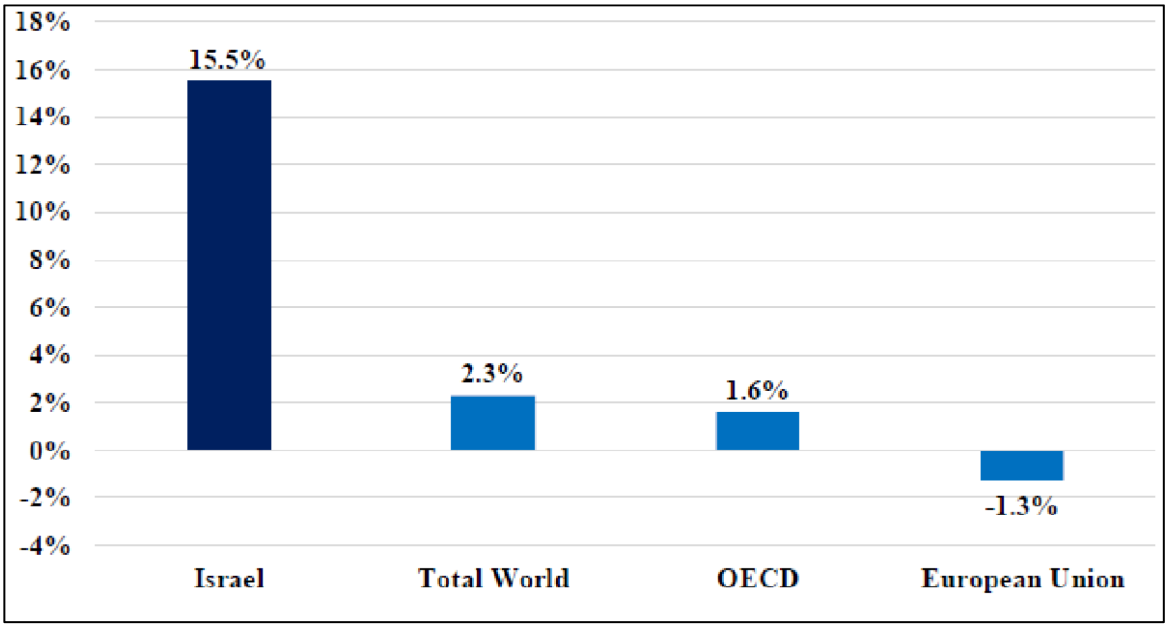

Figure 9: natural gas consumption growth in Israel and internationals – high rate compared (Energy, 2018, p. 5)

On the investment cost, the Tamar gas field development has cost about $3.5 billion until 2016 to reach an annual supply capacity up to 12BCM. In contrast, the Leviathan gas field development has estimated to cost about $6-7 billion to provide a yearly total of 16-18BCM. Leviathan is already in service from the eve of 2020. These are investments in the upstream level developed by a consortium of Israeli-US companies, Delek-Noble. On the downstream level, the government has invested in Israel Natural Gas Lines INGL company $1.2 billion to construct the transmission and distribution gas pipeline up to 550 km, receiving terminals LNG near Hadera, and other facilities with an additional $500 million investment projects at the end of 2020. (Cohen & Korner, 2016, p. 14).

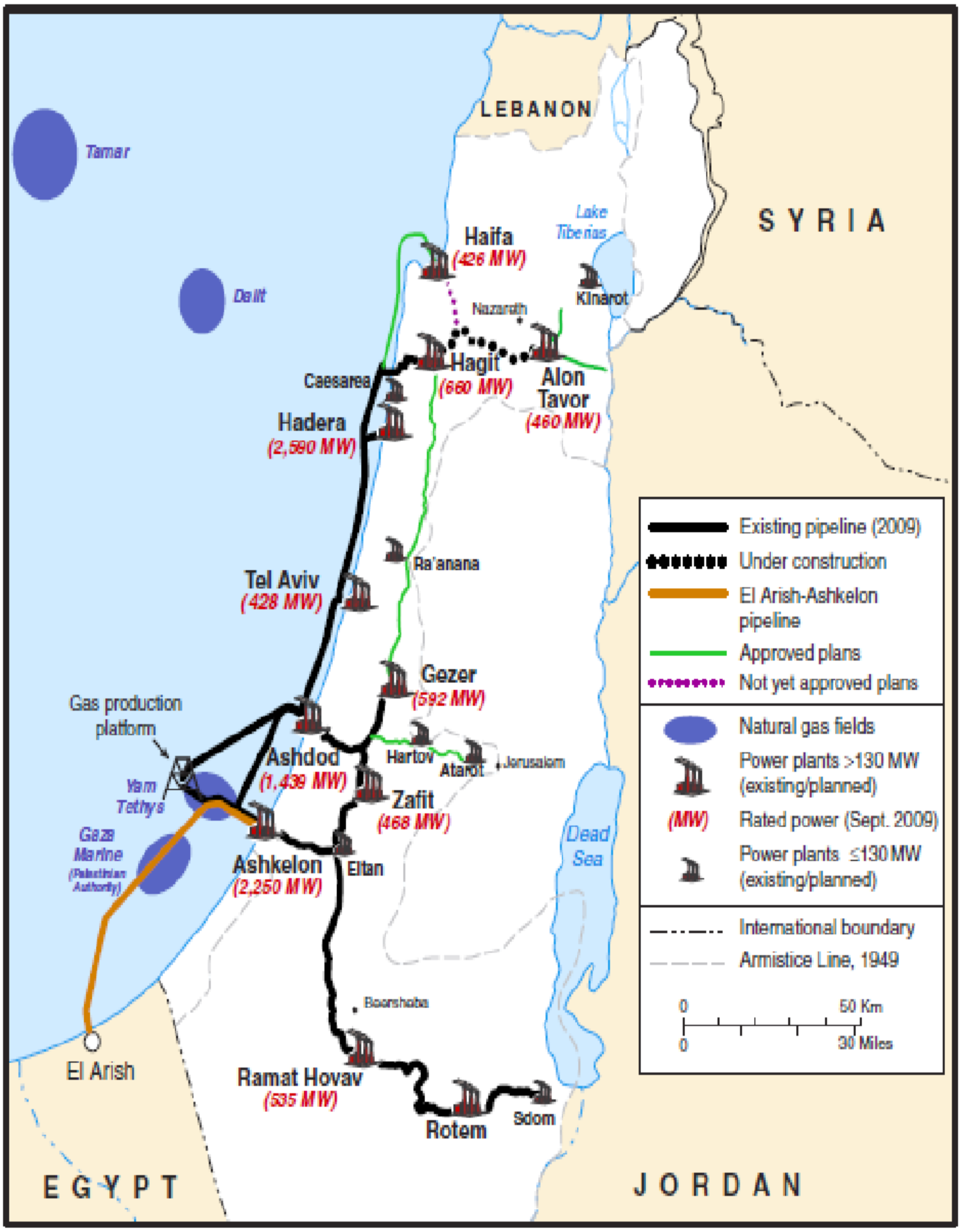

Figure 10: Israeli transmission gas network and main gas fields map (Popper, 2009, p. 10)

On the other hand, Israel heads to use advanced recycling technologies of sewage water and seawater desalination to cope with the natural water resources shortage challenges. For instance, in 2015, Israel's desalination plant 24% of the water consumption (CBS, 2018, p. 15). Israel is one of the leading countries in these technologies worldwide, and all these technologies depend on electricity resources for operations. In this regard, the Israeli scholar Elai Rettig estimated that “gas discoveries would make desalinated water cheaper and more reliable, helping alleviate an issue once prophesied to become the main source of conflict in the Middle East” (Rettig, 2016, p. 11).

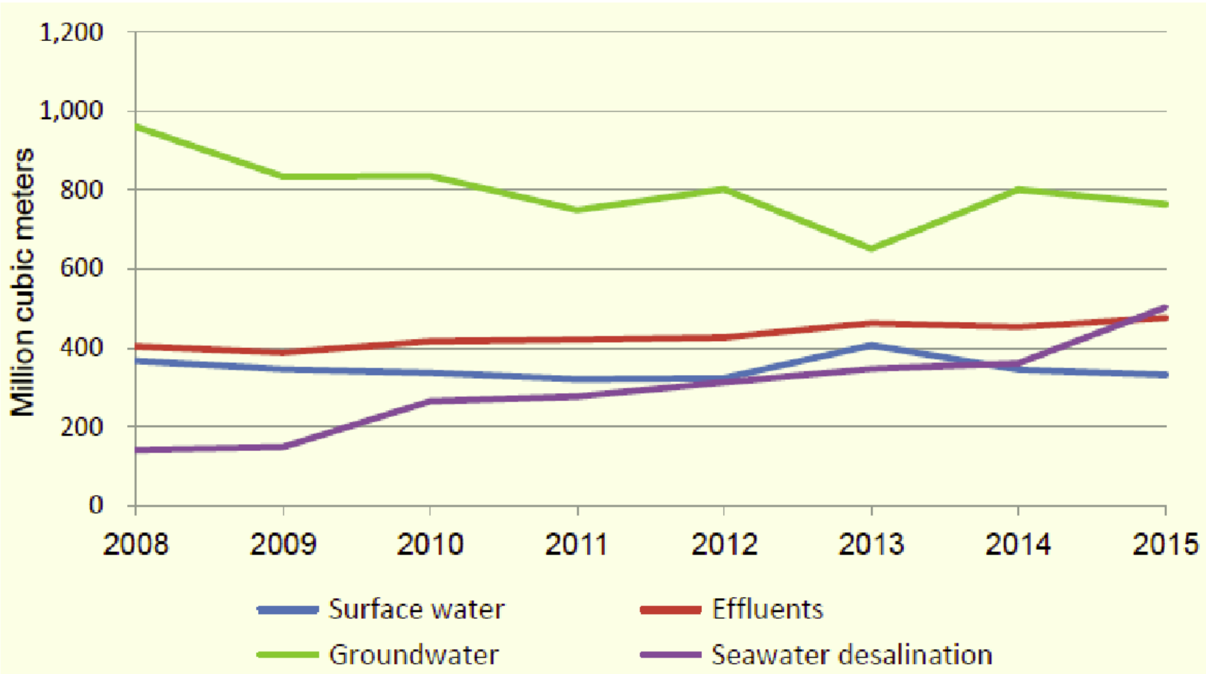

Figure 11: water consumption in Israel by resources 2008-2015 and seawater desalination growth depending on electricity (CBS, 2018, p. 15)

3.3. Energy economics in Israel

In 2010, Israel officially participated in the OECD and became a full member of the Organization. The Israel Foreign Ministry considered this accession to the OECD a strategic importance step for the economy, and its classification as an advanced developed economy encourages foreign investments (Israel, 2020). This strategic step must not be far from the Israeli economy's new position after energy discoveries and looking for foreign investments in natural gas. According to the Israeli statistical book for its 70th anniversary, Israel's area is 22,072 sq. km., which is about half the area of Switzerland or the Netherlands (CBS, 2018, p. 3). It was clear that there were many changes in the Israeli economy after using domestic gas and decreasing imported fuels cost. The current amount changed from a deficit indicator to a surplus from 1950 to 2003 (CBS, 2018, p. 41). The Israeli economist Pinchas Landau explained economic evolution as the following:

> “the continued development of offshore energy resources will eliminate the trade deficit, further increasing the current account surplus— and also generating the fiscal revenues to finance the investments needed in education, infrastructure, health, and housing” (Landau, 2019, p. 116)

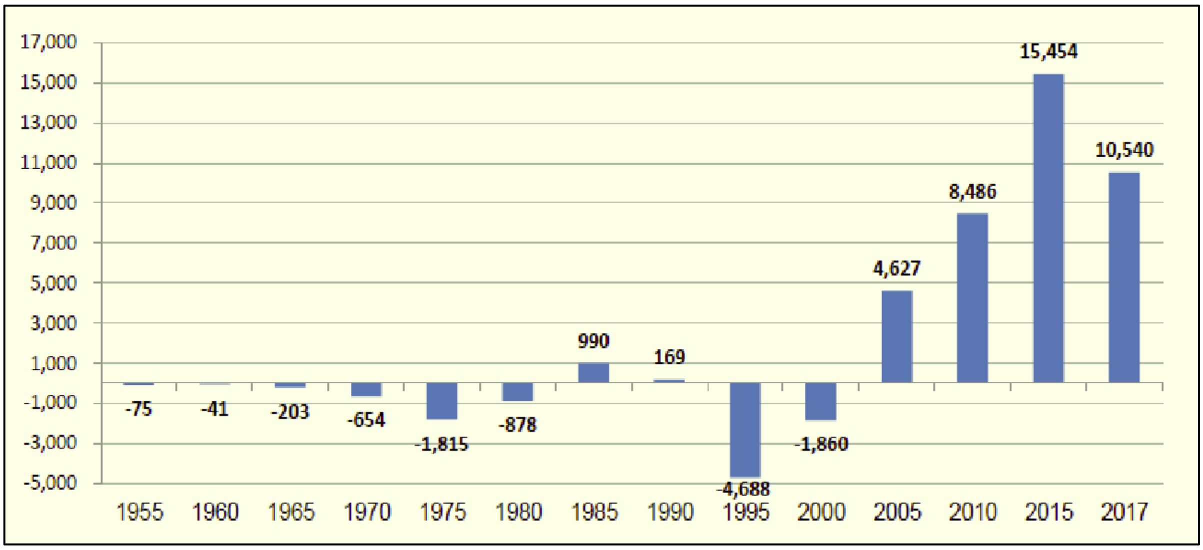

Figure 12: current amount Deficit/Surplus in US dollar 1955-2017 – increased surplus after domestic gas consumption (CBS, 2018, p. 41)

Zaher and Maayan studied the impacts of changing oil prices on Israel's economy in 1988-2013. They found that oil price changes did not affect Israeli economic growth. But on the other hand, the oil import was of a high cost for Israel, and the changes in oil price, e.g., one-dollar increase per oil barrel, will expense an additional 65 million dollars per year (Zaher & Maayan, 2015, p. 1). According to Bank Hapoalim, the use of domestic gas has led to a radical fall in the dollar expanse for importing energy from $16 billion in 2012, associated with Egyptian gas shortage, to $7.6 billion in 2015 after the Tamar operation (Cohen & Korner, 2016, p. 10).

The increase of domestic supply and launching export for the Jordanian side in 2016 with a small capacity of 0.15BCM reduced the import cost by hard currencies (Herzog, et al., 2017, p. 14); these developments increased the demand for Israeli shekels. The exchange rate between Shekel and other currencies needs some new treatment from the central bank. The Bank of Israel decided to purchase foreign currencies to exchange balances (Energy, 2018, p. 14). On the other hand, the increase of domestic gas supply is expected to decrease energy costs, especially for industrial sectors, which would affect the exporting balance of Israel by improving the Israeli competitiveness worldwide and raise its global market share (Energy, 2018, p. 15). The Natural Gas Authority estimated that the impact of using natural gas equaled 54.4 billion shekels between the years 2004–2017 (Energy, 2018, p. 4). For instance, the reserves of foreign currency in Israel exceeded $90 billion for the first time at the end of 2015 (Cohen & Korner, 2016, p. 12).

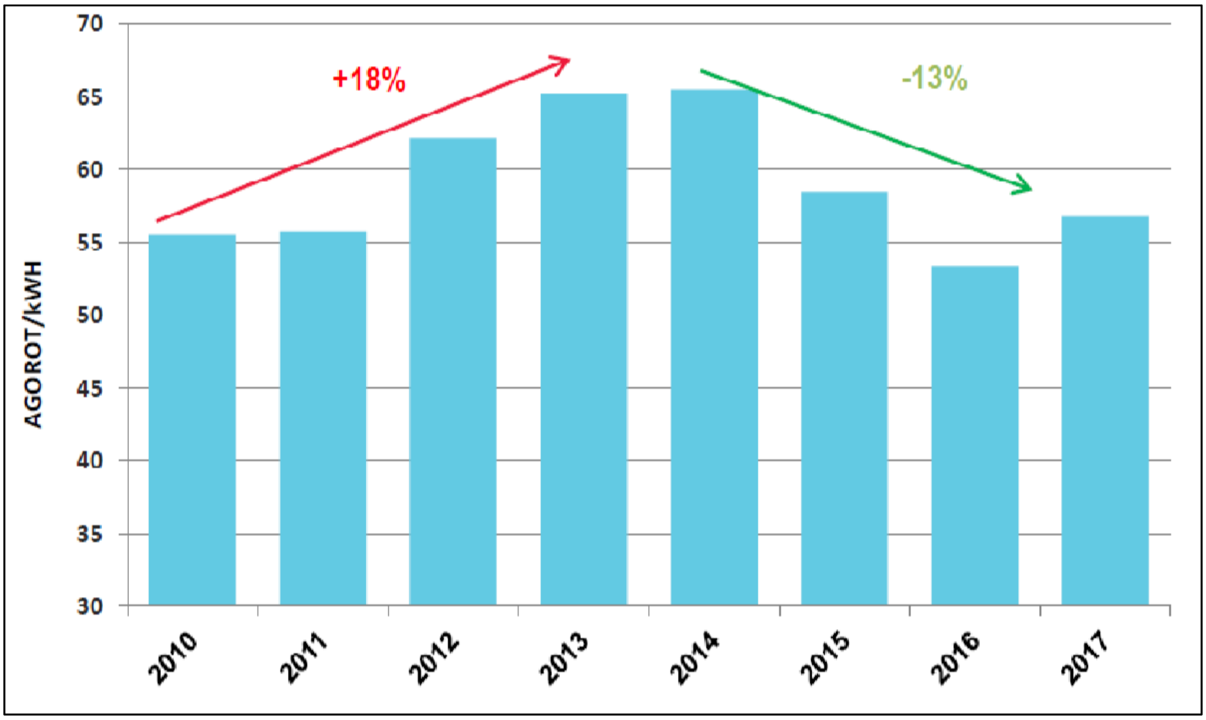

Figure 13: household electricity tariff in Israel 2010-2017 – increased by Egyptian cut off and decreased by domestic consumption (Herzog, et al., 2017, p. 35)

The OECD defined an effect of Tamar's gas production on Israeli GDP that was 1.1% in the first operating years 2013-2014, while it estimates that Leviathan operation in 2020 will not have the same effect this is depending on the limited domestic demand for natural gas (Energy, 2018, p. 3). Nevertheless, according to the Israeli Ministry of Finance, all gas discoveries, except for Leviathan, will share between 1.5%- 2.5% of the GDP per year. This estimation did not conclude the proposed gas exports, especially of the Leviathan field. It was estimated to be 1% higher or lower subject to capacities exports and its price (Cohen & Korner, 2016, p. 11). By comparison, the Norwegian gas revenues impact 15% of Norwegian GDP (Elran, et al., 2011, p. 72), which explains the big difference between the two practices but the convergence from importing country to self-sufficient and then exporting country is a significant turnkey event.

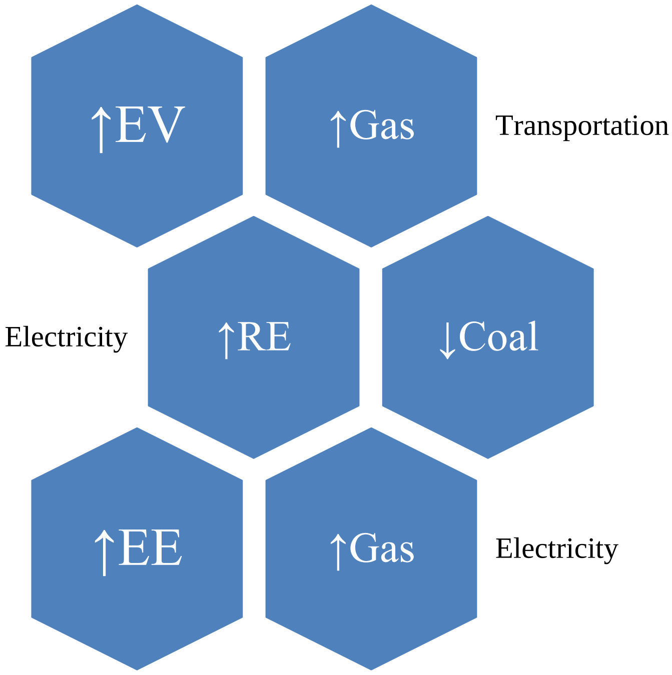

Figure 14: Summary of Israeli policy to exploit domestic gas discoveries

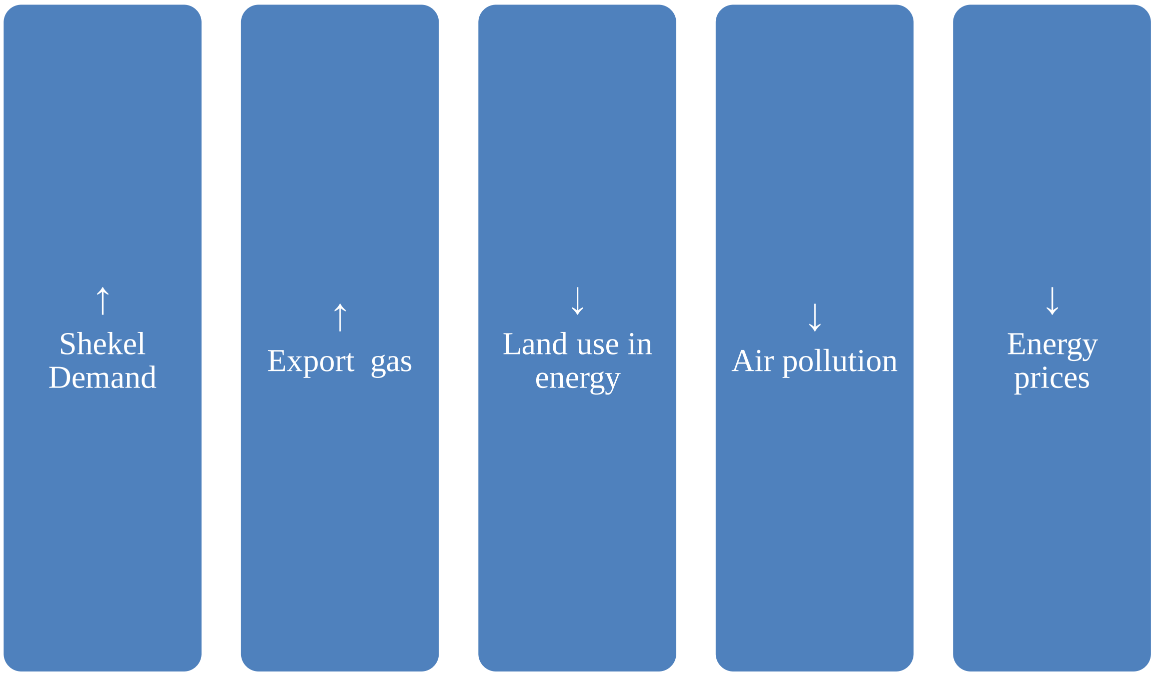

Figure 15: Summary of Benefits of Israeli policy after domestic gas discoveries

3.4.Regional energy system

Historically, the Israeli energy infrastructures are not linked with neighboring countries. The Ministry of Energy defines Israel as an “energy island.” In this regard, the Israeli economy’s readiness and activity in regular and emergencies rely on others (Energy, 2018, p. 17). This isolation was broken by the EMG pipeline, which linked Egypt with Israel to supply gas since 2008, whereas Egyptian oil pipelines and electricity networks are not linked with Israel yet. On the other hand, the Arab Gas Pipeline AGP already passes from Egypt into Syria through Jordan with frozen plans to connect with the Turkish gas network. In 2011, this pipeline was damaged, and the EMG bran connected to Israel (EIA, 2013). Energy infrastructure between Arab countries is also weak in electricity, oil, and natural gas. The region is rich in these commodities, which reflect the regional status of overall fragmented countries.

Referred to EIA statistics, the largest oil reserves in the Eastern Mediterranean region existed in Syrian territories (EIA, 2013). The Syrian government started its first offshore bidding round in May 2007. Furthermore, Turkey and Syria were near to complete the natural gas pipeline with a smaller annual capacity of 3-5BCM between them before the revolutionary breakthrough in 2011. On the other hand, Israel cannot prioritize the infrastructure linking with Syria due to Golan occupation and annexation (Andoura & Koranyi, 2014, p. 47). Besides, Lebanese leaders announced their opponent to Israeli gas exploration; by claiming that part of the gas fields is located in Lebanon’s exclusive economic zone EEZ[1] defined by the United Nations Convention for the Law of the Sea UNCLOS.

[1] The exclusive economic zone is an area beyond and adjacent to the territorial sea, subject to the specific legal regime established in this Part, under which the rights and jurisdiction of the coastal State and the

Note that not all Mediterranean countries are signatories to the UNCLOS, such as Israel, Syria, and Turkey, which raises the conflict about future explorations in the Basin (Tapia, 2019, p. 6). The Lebanese government and Hezbollah Militant vowed to protect their country's EEZ and its natural resources. Noting that, Israel and Lebanon have never agreed on their maritime border addition that both are still at war and have not reached any resolution. On the Israeli side, it has rejected the indirect talk's proposal via a UN channel to resolve the EEZ dispute; Israel requested to begin complete package negotiation to cover all border issues, maritime and ground border (Bahgat, 2014, p. 6). This conflict could postpone development plans in the dispute areas only. On the other hand, Lebanon and the Republic of Cyprus RoC agreed to determine their EEZ boundaries, which do not get Lebanon's parliament approval because of the Israel dispute linkage (EIA, 2013).

In parallel to Israel's gas discoveries, RoC has also made significant explorations to discover the Aphrodite gas field was also executed by Noble Energy in 2011 with a capacity estimated 200BCM. There are also other international developers of the Cypriot fields such as the Italian company Eni, South Korean company KOGAS, and the French firm Total (EIA, 2013). Meanwhile, RoC was studying the choice of importing Israeli natural gas until the ability to develop its fields (Nathanson & Levy, 2012, p. 63). In addition to RoC's plan to construct a natural gas pipeline reaching its power plants, there are no gas pipeline networks installed yet (Nathanson & Levy, 2012, p. 31). RoC's weak infrastructure makes the cost of supplying gas from Israeli fields to RoC high, i.e., up to $2 billion. This complex situation can be skipped by a new

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rights and freedoms of other States are governed by the relevant provisions of this Convention. (UN, 1982) proposal to build an LNG offshore plant or using the undersea pipeline to reach big markets in Turkey or European Union EU (Rettig, 2018, p. 231).

Additionally, another proposed project links two countries by the undersea electric transmission line and connects with Greece and the EU network. The last proposal was appropriate to transfer Israel and RoC from an isolated electricity network to an integrated system. Furthermore, the plan will meet their energy security perspectives and apply the EU's interconnected energy market plan by installing a 2000-megawatt cable to link Asia and Europe by the undersea network. Even though the project's initial agreement was inked in March 2012 (Nathanson & Levy, 2012, p. 63), it is not implemented yet.

Table 3: Oil and natural gas reserves in Eastern Mediterranean region (EIA, 2013)

Country	Proved reserves, 2013 (billion barrels)	Total oil supply, 2012 (thousand barrels per day)	Total petroleum consumption, 2012 (thousand barrels per day)	Proved reserves, 2013 (trillion cubic feet)	Dry production, 2011 (billion cubic feet)	Consumption, 2011 (billion cubic feet)
Cyprus	--	0.01	60.04	--	--	--
Israel	0.01	5.84	301.65	9.48	91.82	117.25
Jordan	(s)	0.16	108.61	0.21	8.12	37.43
Lebanon	--	--	104.86	--	--	--
Palestinian Territories	--	--	23.26	--	--	--
Syria	2.50	182.46	257.65	8.50	277.93	286.76
Total, Region	*2.51*	*188.47*	*856.07*	*18.20*	*377.87*	*441.44*

Total oil supply includes crude oil, condensates, natural gas plant liquids, refinery processing gain, and other liquids
(s) = Value is too small for the number of decimal places
"--" = No value

3.5. Export policy and options

To exploit the new gas discoveries, Israel headed for a particular policy by increasing its gas consumption in overall economic sectors. Nevertheless, Israel's natural gas reserves are more than 90 times its consumption in 2017 (Herzog, et al., 2017, p. 85). In this regard, the questions appeared about whether Israel should limit the export or open it since the discovery's moment in 2011. There was a considerable public demand to favor the domestic market and restrict exports to save these incoming generations' worth. That's why Israel appointed Shaul Tzemach, the Ministry of National Infrastructures' general manager, which was later renamed as director committee of the Ministry of Energy (Sachs & Boersma, 2015, p. 11).

Referring to the Israel Natural Gas Authority expectations, Israel's natural gas demand will equal 447 BCM in the next 25 years. The Tzemach Committee recommended that the gas volume be maintained for the domestic economy is 500 BCM in total (Energy, 2018, p. 2), representing 50% of Israel's gas reserves (Andoura & Koranyi, 2014, p. 39). Meanwhile, the Israeli National Security Council has recommended gas export opposition "due to concerns of strategic dependence on other countries" (Nathanson & Levy, 2012, p. 34). In the final, the Israeli Government permitted to export 400 BCM of gas out of the total proven discoveries to date in 2013. In that sense, the OECD considered this significant step as the primary means to encourage additional exploration to attract international investors (Cohen & Korner, 2016, p. 21).

Table 4: Israel gas supply forecast of Domestic, Egypt, and Jordan in 2025, by source and market (BCM) (Herzog, et al., 2017, p. 13)

Gas Source	Target Market			
	Israel	Jordan	Egypt	Total
Tamar	9.5	0.15	1.0	**10.7**
Leviathan	7.0	3.5	0.7	**11.2**
Karish/Tanin	3.0	0.0	0.0	**3.0**
LNG import	1.0	-	-	**1.0**
Total	**20.5**	**3.7**	**1.7**	**25.9**

As an 'energy island' state, Israel understood the need to avoid infrastructure complexity by using natural gas technologies' liquefaction. Liquefaction could be executed either at an onshore facility or offshore by a floating facility—the first proposal of an onshore facility in Israel was Eilat. The Ministry of Environmental Protection opposed it because it would be required to be set several kilometers aside from the civilians' area (Nathanson & Levy, 2012, p. 33). The offshore option was proposed as a floating liquefied natural gas (FLNG) installation on the Mediterranean coast with a cost estimation of around $5 billion, which is still cheaper than the onshore facility and more secure (EIA, 2013).

Israel announced at the end of 2012 that the Australian Woodside company would develop the LNG facilities. Israel is interested in the Asian gas market as an emerging and competitive market (Maryasis, 2013, p. 97). But in 2014, Woodside surprisingly withdrew from the Israeli gas field, Leviathan (Wolfrum, 2019, p. 2), which was impacted negatively by the Israeli plans to export the LNG to the Asia market or others (Prontera & Ruszel, 2017, p. 149). The LNG option as an easy one was canceled before it operated.

Under the failure to bypass the islanding situation, Israel returned to the cheapest option of regional pipelines with neighboring states (Rettig, 2018, p. 229). As for the

Palestinian side, Palestine still cannot exploit Gaza's natural gas field due to the political situation's complexity, especially after Hamas seized Gaza's authority since 2007. Furthermore, circles of negotiation are being held between Israeli and Palestinian officials to reach natural gas deals, mainly in Israeli Prime Minister Ehud Olmert's period. Still, the lack of a political will has increased this negotiation complexity (Bahgat, 2010, p. 409).

Some of these negotiations reached an agreed point to make a gas swap deal between Israeli and Palestinian demands in West Bank. In 2005 and 2006, BG Group proposed another option to exploit marine gas by sending it to Egyptian LNG facilities. However, the difficulties raised in the negotiations and led to BG's withdrawal from the Israeli and Palestinian market in 2008 and to close its office (Henderson, 2014, p. 2). Eventually, in 2014, the Leviathan field's developers declared that the Palestine Power Generation Company PPGC, a company owned by a Palestine investment Fund PIF as a national fund, had agreed to import natural gas for the following 20-year with a total cost that reached $1.2 billion. The PPGC was the first announced customer of Leviathan field (Henderson, 2014, p. 7), however, this agreement was also canceled due to political and financing issues.

Moving to the Jordanian side, Jordan appeared as an excellent future consumer. Even though Jordan was suffering from an electrical energy shortage, it did not need elaboration about the poor energy infrastructure linked with other Arab countries due to regional instability, which lessened the energy flow reliability and affordability. This project made Jordan more open to cooperating with Israel in the energy sector. Furthermore, Jordan has no natural gas competitive option. It has minimal domestic gas exploitation at the Risha field, which led Jordan to meet the excess consumptions needed by LNG importing via Aqaba port (Herzog, et al., 2017, p. 93).

In 2016, an agreement between the two countries obligated Israel to supply a substantial portion of Jordan's required natural gas for electricity needs. The agreement required a pipeline south of the Dead Sea for pumping natural gas to Jordan, which has operated since 2017. Additionally, there was an agreement for constructing a second pipeline that will be finished by the end of 2019 (Wolfrum, 2019, p. 2), which will serve the Leviathan exporting gas to meet the 4 BCM annual basis. These agreements were concerned about the gas demand growth in Jordan that will reach 6 BCM annually or more in 2025 (Herzog, et al., 2017, p. 93).

On Egypt's side and after returning the state stability, it became the most extensive regional LNG importer in 2016 utilizing the existing two LNG facilities. Nevertheless, that was still not reaching Egyptian domestic demand. Additionally, Egypt has good experience in gas services. Surprisingly, a significant gas field was discovered in the same period called Zohr with a total capacity of 850BCM. This new discovery made expectations of raising gas production for the first time since 2009 (El-Katiri & El-Katiri, 2014, p. 31). In this regard, Egyptian gas will cover the domestic market without a surplus for export. Besides, Egypt’s population is ten times more than Israel, whereas its gas reserves are greater than Israel with three times only (Herzog, et al., 2017, p. 95). These figures made Egypt a very close, cheapest, and competitive opportunity for Israeli gas. Both countries crowned that by the 2018 ten-year export contract signed between the developers in Israel and Egypt for a 64BCM natural gas deal. This deal would exploit the existing gas infrastructure between two countries that previously supplied gas from Egypt to Israel, which has been left since the 2012 gas cut-off (Rettig, 2020, p. 6).

In parallel to the regional projects, Israel is interested in reaching a big market in Europe. According to the International Energy Agency IEA, the European natural gas produced locally is diminishing and expected to decrease from 215 BCM at a current level to 100 BCM by 2030. This reduction will be covered by increasing the natural gas import. Furthermore, the leading gas supplier of the European market is already from Russia with over-supplied amounts. This market needs some development, especially in south-eastern Europe, which is not covered with enough supply. On the other hand, Europe may head to increase its energy suppliers' diversifications (Nathanson & Levy, 2012, p. 34). After many Ukraine crises with Russian suppliers, this diversification policy was encouraged, which affected the Eastern Mediterranean resources' European approaches to be a potential future energy alternative resource (Vogler & V. Thompson, 2015, p. 8).

To reach the European market, Israel has different options, the first option is via the Egyptian route. In this context, the gas contract in 2018 may be used to supply the European market after the liquefaction of gas in Egypt. The EU's Directorate-General for External Policies published a study in 2017 indicating that Egypt has a vital role in the Eastern Mediterranean gas market. The study recommends exploiting the existing Egyptian gas infrastructure that flexibly meets the European gas market (Wolfrum, 2019, p. 4). Besides, the RoC is also interested in strengthening its energy relations with Egypt, which was translated in February 2015 MOU to use Egyptian gas facilities and propose the pipeline from RoC's gas fields to Egypt (Prontera & Ruszel, 2017, p. 150).

Nevertheless, RoC Initiated an open discussion in 2015 with Israel to test the possibility of merging gas pipelines from Israel-RoC fields, Leviathan-Aphrodite, to transfer gas to Egypt, (Prontera & Ruszel, 2017, p. 150). Israel and Egypt have not agreed yet about their EEZ boundaries, but Egypt defined only its border with Palestine-Gaza strip (EIA, 2013). On the other hand, Egypt and RoC defined their EEZ in 2003, which became official and in force since 2004 (Nathanson & Levy, 2012, p. 17).

At that time, the second option for reaching the European market was Turkey, which is considered as a poor energy resources country that depends on its neighbors to import energy resources such as oil and natural gas via a well-established infrastructure. This infrastructure links it with Azerbaijan (13% of its gas import), Iran (16% of its gas import), Russia (55% of its gas import), and Iraqi-Kurd oil import. Furthermore, Turkey is the energy hub in its region and has LNG infrastructure, which assists it to import minor LNG quantities provided by Algeria (8.1%of its gas import) and Nigeria (2.6% of its gas import) (Prontera & Ruszel, 2017, p. 153). That’s why Israel viewed Turkey as a prospective natural gas partner (Energy, 2018, p. 14). Before gas discoveries, Israel announced in 2006 that it had begun a cooperation program with Turkey to link two countries via an underwater pipeline network to transport oil, natural gas, electricity, and water (Tanribakan, 2009, p. 10) which was still under freeze due to multiple reasons.

The underwater network is considered to be a very complex plan without political will. On the other hand, Israel needs to reach the Turkish market via the RoC route for selling gas to Turkey and Europe in the future. This route is a commercially sensible proposal, but it is doubtful on political grounds due to conflict in the Cyprus land (El-Katiri & El-Katiri, 2014, p. 22). In this regard, the Turkish option seems an economically realistic option, utilizes the Turkish infrastructure and location as a transit country that transfers the Caspian and Russian gas to the European market. The Turkish route faces obstacles in Israel-Turkey's political relations after the Mavi-Marmara attack in 2010[2] and the frozen conflict in Cyprus Island between Turkey and RoC-Greece parties (Rettig, 2018, p. 232).

Generally, the exploration operations executed by Egypt, Israel, and Lebanon are not problematic in the region (Tapia, 2019, p. 17) since most of their gas fields are located in undisputed EEZ. The main problem still lies with Cyprus Island, which already has a protracted conflict. The Lausanne agreement in 1923 would draw the Aegean Sea as the De facto Greek sea depending on the sea law, which would make the Turkish access to the international waters drastically reduced. In addition, the situations of both sides on EEZ delimitation are tricky to align (Tapia, 2019, p. 5). On the RoC-Turkey relations, it is complicated to think that the Cyprus problem could be resolved free of Greek-Turkish relations (Tapia, 2019, p. 4).

In 1974, under the justification of protection of the Turkish people on the island, Turkey interfered militarily and controlled 37% of the island in the northern part (Dokos, et al., 2018, p. 5). The domestic governments in the north part, called the Turkish Republic of Northern Cyprus TRNC supported by Turkey, assumes that the gas resources cannot be divided or exploited unilaterally by the Greek-Cypriot community in RoC. As counter steps to RoC, TRNC has announced seven gas resources concessions areas, having negotiated the beginning of the exploration with the official Turkish petroleum corporation (Tapia, 2019, p. 18).

[2] The Mavi Marmara incident in 2010, when Israeli forces boarded a flotilla of ships headed from Turkey to Gaza — with considerable loss of life — led to a nearly complete breakdown of relations between the two countries. Ambassadors were recalled, trade — including sales of military equipment — was disrupted, and Turkey refused to continue participating in the U.S.-Turkey-Israel trilateral Reliant Mermaid series of naval exercises. (Vogler & V. Thompson, 2015, p. 8)

The EU opposed TRNC steps and "warned Turkey over illegal drilling actions in the Eastern Mediterranean, threatening Ankara with sanctions" (Atmaca, 2019, p. 5). Despite this critical situation, Turkey declared that it would start punishing energy developers contributing to RoC seawater activities in 2013 (EIA, 2013). Besides, Turkey has practiced what is considered aggressive intervention by sending warships into disputes' waters to provoke gas exploration vessels (Rettig, 2020, p. 4). In 2019, Turkey agreed with Libya to define a new maritime border despite RoC’s opponent since it will cancel a massive part of its EEZ.

Greece became the third option to transfer the gas to Europe via an undersea pipeline from Israeli offshore gas fields to RoC-Greece and Europe (Nathanson & Levy, 2012, p. 32). This proposal was initiated directly after gas discoveries in late 2010 by Israeli Prime Minister Netanyahu, who offered to provide natural gas to Greece (Bahgat, 2011, p. 29). This project, so-called EastMed, was submitted officially to the EU to finance it (Nathanson & Levy, 2012, p. 32). The project may be feasible considering the engineering capabilities. However, its economic feasibility is under serious doubt (Rettig, 2018, p. 232) since it required very deep pipeline construction.

On the other hand, EastMed contributes to improving energy network connectivity with the EU, which would cost around 7 billion euros and will take up to four or five years. By 2022, the development and planning study should be finished, and then the final decision of implementation will need the EU Commission of financing approval. This pipeline is an ambitious project for Israel since it will secure a big market and open a way out of Israeli energy island status (Wolfrum, 2019, p. 3). In this regard, natural gas discoveries in the Eastern Mediterranean region may be an essential gas supplier for Europe and meet the ‘European energy security’ (Dokos, et al., 2018, p. 4). These discoveries mean that the EU has direct interests in the natural gas supply from this region to balance Russian resources as hegemony resources in Europe (Tapia, 2019, p. 26).

Table 5: Cooperative Projects for Exploitation Eastern Mediterranean gas reserves (2011-2014) (Prontera & Ruszel, 2017, p. 147).

Projects	States Involved (* Main Supporter)	Gas Capacity (bcm/year)	Estimated Cost (USD billion)	Estimated Year of Operation (as of 2014)
LNG Plant	Cyprus* and Israel	7-14	10-15	2020
Pipeline	Israel-Cyprus-Greece*	30-40	17-20	Post 2020
Pipeline	Israel-Cyprus-Turkey*	5-11	5-10	2023-2025
Pipeline	Israel-Turkey*	5-11	5-10	2023-2025

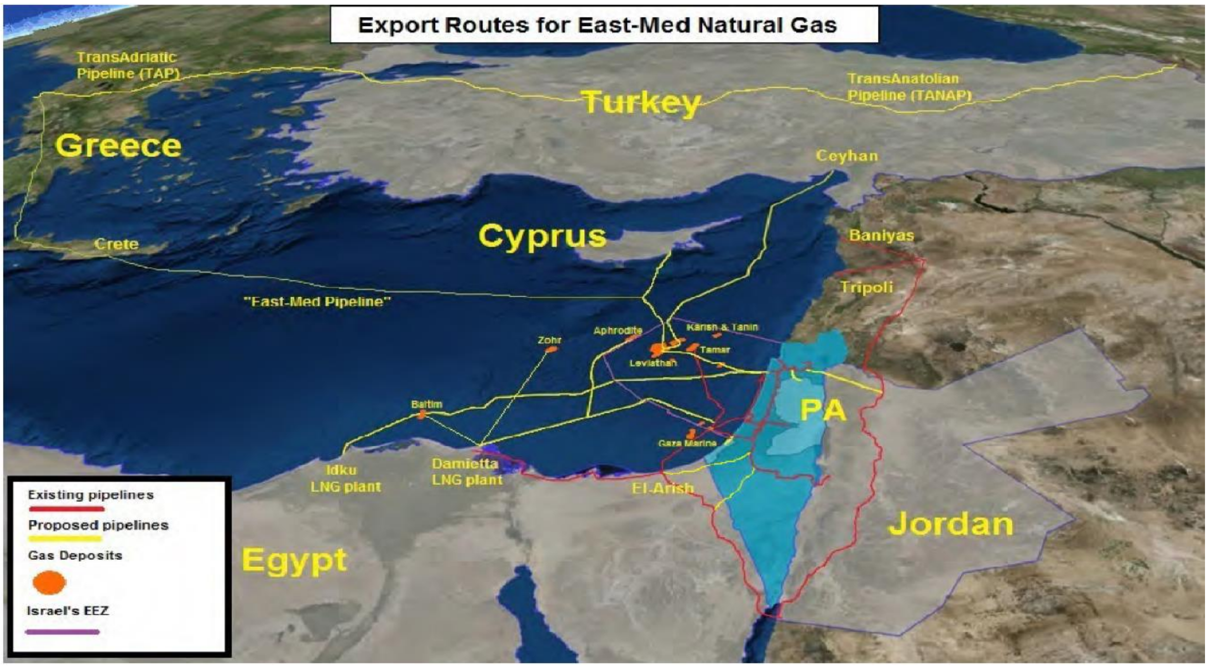

Figure 16: Export Routes and proposals for EastMed projects (Rettig, 2018, p. 234).

3.6. International players and EastMed project

The US companies are the leading developers of the gas fields in different region's countries. Pointing out that this US existence expresses that there are US interests in the natural gas resources in the East Mediterranean. Sir Michael Leigh, Senior Advisor at The German Marshall Fund, studies the region's American view from an energy perspective. Leigh mentions that the US "are concerned because of possible security risks; they are concerned because of the presence of US Navy in various parts of the Mediterranean, which could conceivably become involved if ever there were to be any clashes at sea in the region" (Nathanson, et al., 2013, p. 59).

In this regard, US Senator Robert Menendez visited Eastern Mediterranean after passing a new decree in the US congress about relations with RoC in 2019. In the RoC president meeting, Senator Menendez said that "this is a great moment for Cyprus to form a new relationship with the United States and the West". Menendez's efforts aimed to lift "the embargo on the sale of arms to Cyprus" that will meet the US's geostrategic interest clearly after the specific energy interests of US companies working in RoC (Cyprus, 2019). Furthermore, the congress tries to exit Turkish participation in the F-35 airplane program as retaliation for the Turkish step of Russian S-300 air defense missiles procurement (Atmaca, 2019, p. 5).

Moving to the Russian side, Russia is more likely to manage competition in supplying natural gas to Europe by pipeline than obtaining direct economic profits (Tapia, 2019, p. 23). Russia has reinforced its role thanks to the Syrian conflict, where it has got a substantial army presence in the essential ports of Syria (Tapia, 2019, p. 23). Additionally, Russia intervened in the Syrian conflict since 2015 to support the Bashar al Assad regime. SoyuzNefteGaz (SNG), a Russian energy company, signed a long-term agreement from energy lenses, for 25 years, in late 2013 with the Syrian government to develop and explore the natural resources and energy sector. This agreement indicated Russia’s commitment to securing its interests in Syria and the region (Vogler & V. Thompson, 2015, p. 6).

Furthermore, Russia has returned to establish a permanent naval presence in the area for the first time since the dissolution of the Soviet Union (Vogler & V. Thompson, 2015, p. 6). Before that, Russia expressed a high degree of consideration to Israel's natural gas discoveries in 2012 by Gazprom, since it has natural gas reserves 22 times bigger than the Leviathan field. Israel specialists were somewhat concerned that Gazprom may be used as a Russian tool to put political pressure on Israel; other experts thought that linked to Russian policy towards EU energy supplies control. These Russian efforts failed to enter the Israeli gas market yet (Maryasis, 2013, p. 95).

Finally, China is increasing its presence in the region, and this presence is part of the “Belt and Road Initiative” by the Chinese president. Under this initiative, Chinese companies took control of the Port of Kumport, the third most significant port in Turkey located near Istanbul, Piraeus Port, in Greece, and in 2018 it was awarded to take charge of the management of Port Haifa in Israel (Tapia, 2019, p. 24). Sooner or later, China could drive the need to maintain security to its interests, such that its maritime forces' presence in the Mediterranean could become regular (Tapia, 2019, p. 25). All these issues may escalate the conflict in the region, not only for energy but also for the geopolitical system after Russia intervened in Syria and China's new Silk Road initiatives.

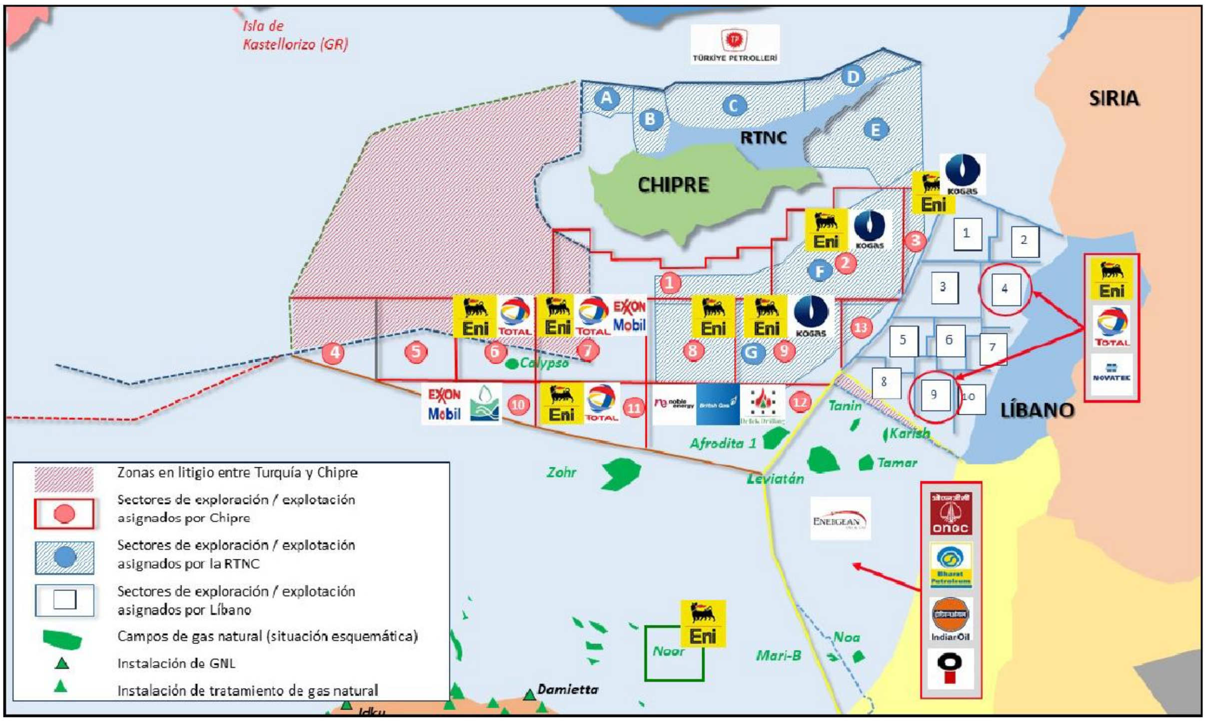

Figure 17: Assignment of exploration and exploitation gas blocks by international players (Tapia, 2019, p. 17)

Regional

- Egypt ✓
- Jordan ✓
- Palestine X
- Lebanon X
- Syria X

Asia

- Ausralian Company X

Europe

- Egptian route ✓
- Cyprus-Greece route (EastMed) ✓
- Turkish route X

Figure 18: Summary of the export option of the Israeli gas

4. Energy theories

This chapter makes a theoretical background of analysis based on energy theories. The chapter will be divided into four sections; the first section discusses energy security theory. It describes energy security components, availability and the role of the energy market to meet it, affordability prices, price shocks, reliability, and the state's role to facilitate the efforts to avoid supply interruptions and sustainability components as a reaction to the climate change crisis. The second section explains geopolitics and its effects on energy, which introduces geopolitics' definitions and features. It elaborates the geopolitics features an effect on energy, which focuses on the energy Chokepoints definition and its role to control the energy supply chains. Finally, it studies the relationship between energy resources and conflict, which focuses on energy as a weapon in wars and escalates it.

Because Israel is part of the Middle East region, any research in Israel's energy theories needs to study the region from an energy perspective. In this context, the third section examines the relationship between energy resources and the Middle East. It also focuses on how energy impacts wars, weapon trades, and infrastructure systems adopted in the region to control energy resources and supply since initial oil discoveries during the colonial period. It also introduces the international military existence, such as the US role in maintaining energy security in the Gulf. Additionally, it discusses war impacts on energy and oil supply. In contrast, the Iraqi-Iranian war in the 1980s is a clear example of the relation between war and military actions in energy states and effects on energy supply.

4.1. Energy security

Traditionally, in international politics, States are vital agents and referents to meet security requirements. Still, this concept was widened in 1983 by the book publication 'People, States and Fear' by Barry Buzan. Buzan added other security concept dimensions arguing that security is related to all human activities, not just circulated about the state role (Williams, 2008, p. 3). Buzan adds a significant level to meet the security by economic factors; this ***Economic*** **security** concentrated on open access to the resources, finance channels, and markets required to retain appropriate welfare levels and maintain state power (Williams, 2008, p. 4). Access to resources and incredibly **Natural resources** has played a prominent role in armed conflicts history. Arthur Westing defines different groups of belligerents' aggressive actions as inspired or funded by natural resources, from wild game rivalry to merchant capitalism and imperialism battles for scarce minerals (Le Billon, 2001, p. 562).

Energy resources drive economic security, and the state always aims to secure its energy needs to realize economic stability and security (Klare, 2008, p. 484). The IEA defines energy security as “the uninterrupted availability of energy sources at an affordable price (Weissenbacher, 2012, p. 452). Elkind considers this definition a Traditional one that reflects the reliability of supply by avoiding interruptions, availability, and affordability. A modern thought of energy security must also conclude the fourth dimension to deal with environmental challenges, especially after the climate change crisis (Elkind, 2010, p. 121).

Availability entails the existence of commercial energy **markets** in which buyers and sellers exchange energy products and services; that take form only after parties agree on terms that meet the interests of buyers, sellers, and commercial, economic, political, strategic, as well as others (Elkind, 2010, p. 123). The Potential main threats of availability components in energy security are the market development limitations and restrictions opportunities (Elkind, 2010, p. 122). On the **Reliability** side, the degree to which energy services are secured from disruption and **interruption** is known as reliability (Elkind, 2010, p. 124).

As a consequence, energy reliability can be a matter of life and death in certain circumstances. Enhancing energy security via reliability can be met by multiple activities. The first actions are diversifying energy supply sources and diversifying the supply chains used to process, transport, and distribute energy. The Second efforts are increasing the reserve capacity and developing energy infrastructures like pipelines, power generation, and transmission systems, reducing energy demand, and creating emergency supplies (Elkind, 2010, p. 124). The state's main work to maintain energy reliability is to be safe from terrorist attacks, extreme weather, and political disruptions in the short and long term (Elkind, 2010, p. 122), reflecting the continuity of supply and continuity of life. In this context, Energy security depends on states' policy and particularly the *foreign policy* level, so that states' diplomacy objects to establish sustained friendly relations with key energy providers and facilitate energy supply chain and international energy companies (Klare, 2008, p. 487). It was clear that reliability depends on political-level policies and decisions, reflecting the state's understanding of energy security.

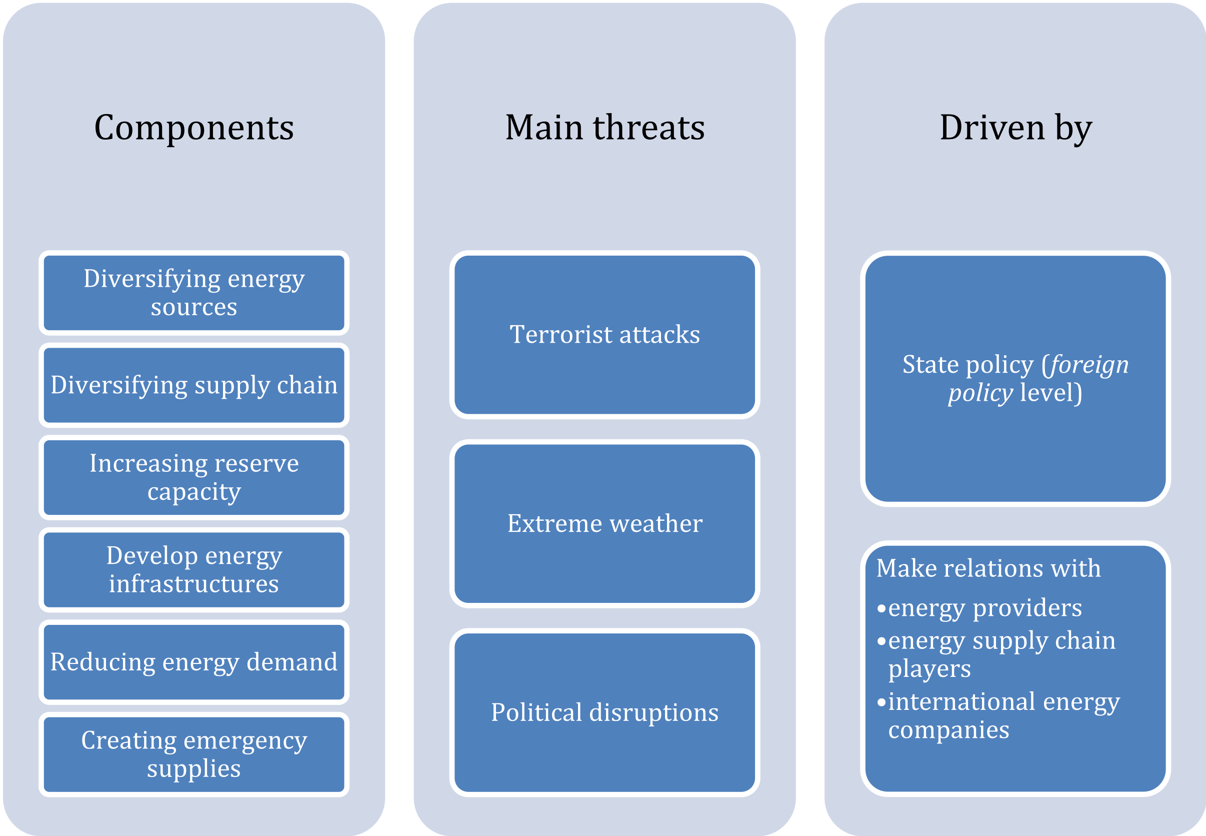

Figure 19: Summary Reliability of Energy

On the other hand, whenever Energy is not **affordable,** it cannot be used. That's why nearly 1.8 billion people worldwide suffer from chronic energy insecurity, which means they do not have access to electricity in their homes. **Price shocks** often result in extreme humanitarian or economic distress, or even death. As energy users struggle to cope with unforeseen financial pressures, political uncertainty persists. Prices reflect market conditions and indicate market preferences, affecting purchasing decisions and investment decisions in favor of consumption or conservation (Elkind, 2010, p. 127). But also, the access to energy without the ability to afford it is useless.

Finally, promoting energy security without addressing **sustainability** would enable technologies and activities to accelerate the climate change crisis. Climate change would undoubtedly affect **energy infrastructure,** necessitating the renovation and rebuilding of supply chain infrastructure that supports energy systems (Elkind, 2010, p. 129). Sustainability is translated by using energy resources to serve long periods or not be scared (Elkind, 2010, p. 127).

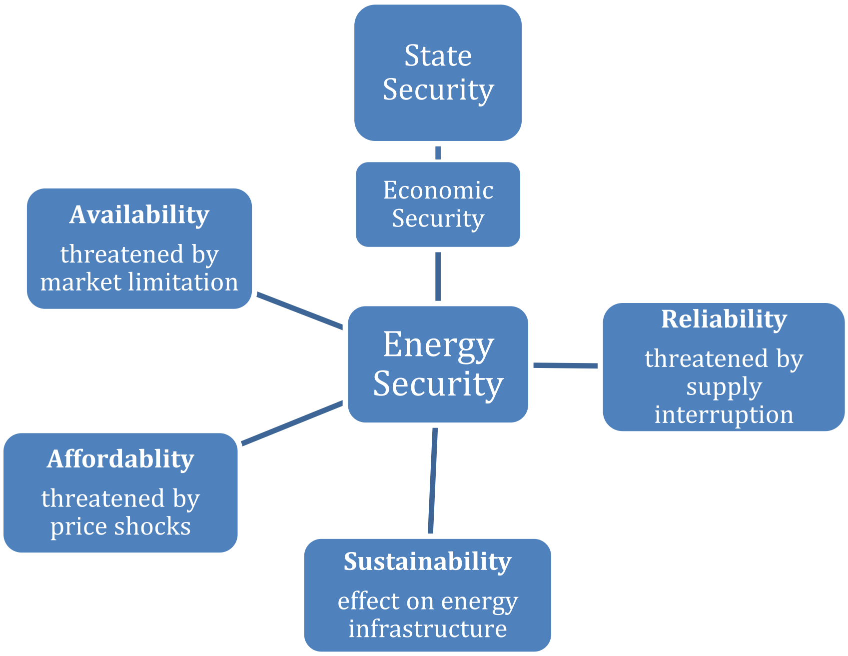

Figure 20: Energy Security Components

The energy security of natural gas has a unique model, that's why natural gas markets' establishment needs physical resources, innovative technology, appropriate regulatory frameworks of legal and pricing issues, and domestic societal acceptance. As this listing explicitly indicates, the idea of natural gas availability in energy security is not as relatively straightforward as it may seem at the first view (Elkind, 2010, p. 123). Brenda Shaffer elaborates that Natural gas pricing –pipeline or LNG–is not determined by the market globally; instead, each contract is separate. So that, there are different gas prices based on various geographical locations around the world. On the other hand, there is no ability to exploit the gas without a market, domestically in the first; approximately 70% is supplied to the producing countries' domestic market. The gas is traded within regions, and gas is limited to trade between regions worldwide (Shaffer, 2013, p. 116).

On the political level of the natural gas contracts, Shaffer sees the states play a more significant role than virtually any other traded commodity and more than in the oil sector. Consequently, investors are keen to secure countries' fulfillment over projects' lifetime and ensure government-to-government agreements. Likewise, since natural gas supply requires the construction of costly permanent infrastructure at fixed sites, Shaffer assures that states must approve the facilities and supply routes (Shaffer, 2013, p. 116). Furthermore, states involved in securing offshore resources like natural gas fields by naval forces and monopolized them by international contracts (Le Billon, 2001, p. 570). As a result, natural gas security is dependent on the traditional components of energy security, i.e., availability, affordability, and reliability.

4.2.Geopolitics of energy

Resource locations play a central role in the exploitation game. As for the energy aspect, the geographic location is involved deeply in the state's policies to extract these resources. Understanding the relationships between energy, geographic location, states' politics, and power, called energy geopolitics which mainly analyzes the state power from energy perspectives. Saul Bernard Cohen defines **Geopolitics** as a study of the relationship between geographical landscapes and attitudes, on the one hand, and political systems, on the other. He adds that "the political processes include forces that operate at the international level and those on the domestic scene that influence international behavior" (Cohen, 2015, p. 16).

Both geographical landscapes and political systems are dynamic, "each influence and is influenced by the other" (Cohen, 2015, p. 16). Nicholas Spykman, a famous US scholar of international relations and geopolitics, defines that the Eurasian coastal lands, counting maritime Europe, the Middle East, India, Southeast Asia, and China, have been the keys to world domination (Cohen, 2015, p. 26). This area has a lot of resources and demographic factors. In this view, there are other links between location and energy resources related to demographic and trade paths.

Regionally, Cohen used the term of the ***Shatterbelts*** region. He defined it as "*strategically oriented regions that are both deeply divided internally and caught up in the competition between great powers of the geostrategic realms*." In shatterbelts, Cohen adds that conflicts are more likely to spread to neighboring states depending on most of such nations (Cohen, 2015, p. 48). The most significant example of the Shatterbelts region is The Middle East; its contemporary realm reflects its fragmentation. The Ts region contains Arab-Israeli conflicts, the wars in Iraq, Afghanistan, Lebanon, Syria, the Horn of Africa, and the challenge of Iranian emergence as a leading power player (Cohen, 2015, p. 49). All those are the description of an unstable and divided region.

From an energy perspective, Geopolitics means the states' efforts to advance their interests abroad, not only politically but also economically (Klare, 2011, p. 30). Energy security crosses geopolitics in many areas, such as prices and affordability. In national energy policies, higher energy costs will make nuclear power a more appealing choice, and the more dependent countries become a nuclear power that may threaten the world order. Moreover, the risk of a break-up from civilian applications of nuclear power to armament will escalate significantly, as the risk of terrorists having weapons and technologies into their hands (Pascual & Zambetakis, 2010, p. 10). On the other hand, the energy resources increase states' power. Iran, Venezuela, Iraq's Saddam, Arab Gulf, and Russia have used their energy resources and leverage to reinforce their regional weight. They have met their good positions through their regional hands and wealth to confuse U.S. hegemony and interests (Pascual & Zambetakis, 2010, p. 17).

The variety in energy resources means a difference in energy geopolitics and security. On the natural gas aspect, it has risen only slightly over the last few decades as a share of global energy consumption across all end users, from 20 to 23.8 percent in the period between 1985 and 2015 (Lehmann, 2017, p. 10). It maintained its position, but it was not linked with political or economic development as oil, the main reason to use natural gas is economically first above other reasons. Incoming decades, Natural gas demand is expected to grow significantly due to its special features like low impact on the environment. The new discoveries worldwide make lower prices which assist emerging markets, it also reduces requests for nuclear energy combined with the Fukushima disaster in 2011 (Shaffer, 2013, p. 115).

But oil gas is different; the first link between energy resources and the geographic location is that oil can be shipped in a tanker quickly and cheaply. That is one of the main features that helped the 'performance' of oil as a primary energy source. At the same time, other fuels like coal and natural gas are much more complicated to transport. Natural Gas, in particular, can only be supplied either by pipeline or, after the Liquefaction process, as liquefied natural gas (LNG) can be shipped at a very low temperature (Luciani, 2013, p. 82). Even though LNG makes a more solid relationship between a producer and a set of consumers without location restriction, which leads to an increase in the LNG prices. So that diversification of gas supply is costly and needs particular infrastructure, in addition to requiring a long-term contractual commitment to secure financing channels of multibillion-dollar projects (Pascual & Zambetakis, 2010, p. 21).

Table 6: Summary Comparison Oil and Natural gas

Oil	Natural Gas
• linked with Industrialization • accelerated armament • Liquid shipped quickly and cheaply • Pricing market globally	• expected grow • low impact environmentally • to transport via pipeline or LNG • prices complicated, regionally

Klare considers that Oil geopolitics has also made the importance of control over the trade routes and supply chain used to export oil, such as the Suez Canal. Klare explains this importance because many primary sources of supply are situated far from the homeland or significant confrontation sites (Klare, 2011, p. 30). The European Commission has defined the Chokepoints as narrow routes for significant transport amounts of foreign maritime trade, including crude oil. The chokepoints' concerns in this context related to its stability especially and environmental threats related to oil tankers accidents (Luciani, 2013, p. 83). Therefore, chokepoints reflect crucial bottlenecks in the energy supply network as they carry high amounts of fuel and goods. Furthermore, the effect of shipping interruptions across them will significantly impact the global oil industry (Luciani, 2013, p. 84).

Table 7: Chokepoints based on EIA, EU, and IEA classifications (Luciani, 2013, p. 84)

Lists of chokepoints	EIA	European Commission Green Paper	IEA
Hormuz	X	X	X
Malacca	X	X	X
Bab el-Mandeb	X	X	X
Panama Canal and pipeline	X	X	
Suez Canal and SUMED pipeline	X	X	X
Turkish Straits	X	X	
Baltic Sea		X	

The chokepoints may complex the state situated in the energy market, such as China energy supply depends on the Malacca Strait. China has attempted diversification from reliance on this chokepoint by constructing a pipeline through Myanmar (Luciani, 2013, p. 96). On the Suez Canal side, to skip the capacities limit of oil shipment, Egypt did a SUMED project, which connects the Gulf of Suez with the Mediterranean in Egypt. This project permits the discharge of part of oil supertankers at the entry of the terminal of the Suze canal and reloads it at the Mediterranean terminal (Luciani, 2013, p. 103).

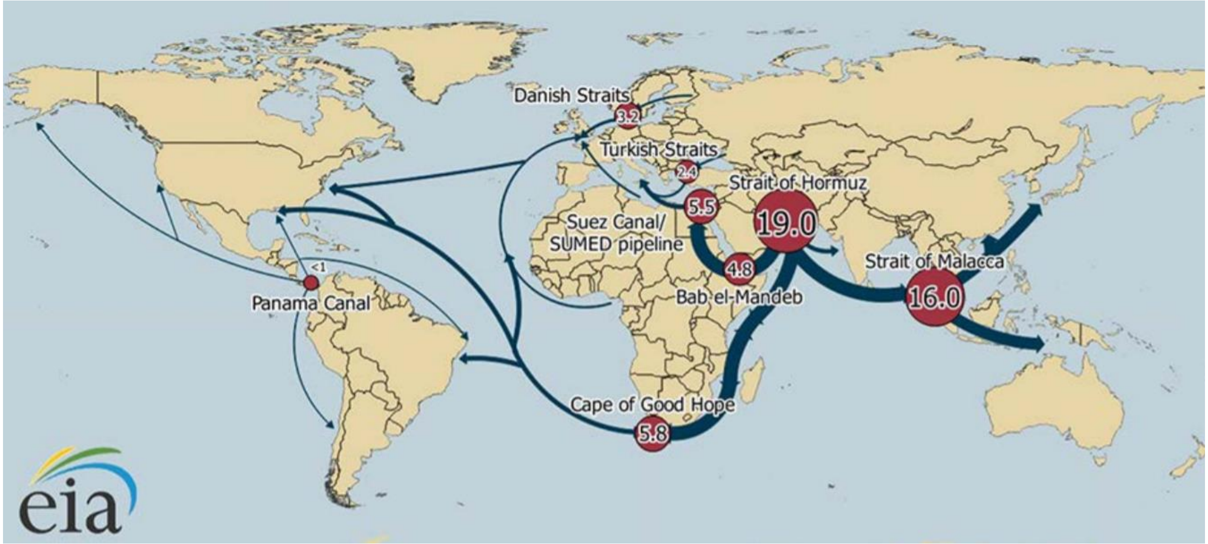

Figure 21: Daily transit volumes through world maritime oil chokepoints all estimates in a million barrels per day, including crude oil and petroleum products. Based on 2016 data (EIA, 2017)

Daniel Moran and James A. Russell explain that in the past, energy resources had been used as a "weapon," and its price represents a variety of political pressures under which a perfect power is added (Moran & Russell, 2009, p. 9). In addition to Moran and Russell's argument, energy resources are still a weapon in the modern world. Also, these could be better targets for states and terrorist groups. A review report published by the 'National Memorial Institute for the Prevention of Terrorism' MIPT reveals that, during the period 1990-2005, terrorist groups carried out at least 330 attacks against energy infrastructure worldwide (Moran & Russell, 2009, p. 9).

World War II WWII also proves that, whenever a full-scale campaign broke out in 1941 by Germany and Japan, both launched military strikes to control the energy resources in their understanding; Germany invaded the Soviet Union and Japan occupied the Dutch East Indies. Additionally, China started a new age of its industrial revolution after thirty years of WWII, in this regard, Chinese foreign policy's main driver has been ensuring sufficient supplies of resources and materials, especially the energy resources with baskets diversification (Klare, 2008, p. 494).

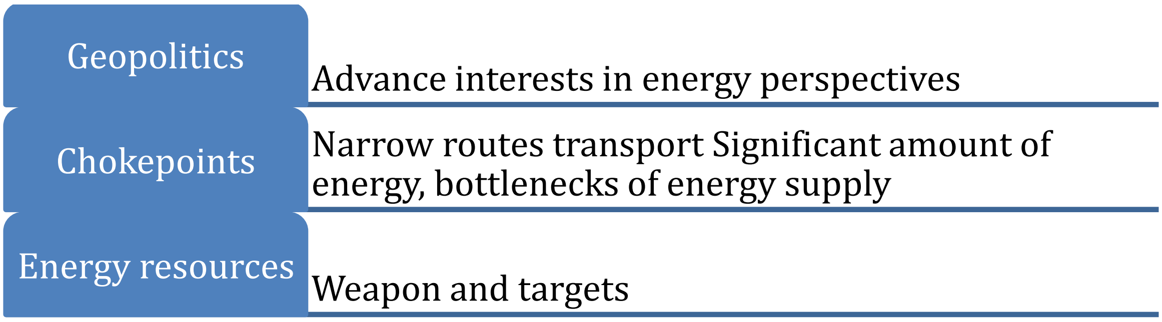

Figure 22: Geopolitics of Energy theories

4.3. Middle East energy security

Paul Collier argues that the most empirical indication shows that countries economically dependent on primary product exports are at greater risk of political instability and military conflict (Le Billon, 2001, p. 562). An excellent example of Collier's is the argument in the Middle East; the Middle East's location at the three continents interface in the Ancient World has long provided international strategic value for its land and seas routes. These routes and the region's vast energy deposits pay great attention to this region by global players. For that Saul Cohen argues that the region's strategic integration has been prevented due to these reasons (Cohen, 2015, p. 376). This fragmentation crossed with what was mentioned in the Shatterbelts concept in geopolitics features.

The Middle East oil pipeline infrastructure, in particular, was designed with security in mind since the colonization period of oil discovery by a specific policy to weaken the resources countries and made them as neighboring dependent states (Moran & Russell, 2009, p. 9). Iraq as an example, colonization maps do not get it a maritime outlet located outside the Gulf. Indeed, even its Gulf port is inefficient and is unable to handle giant crude carriers. Thus, Iraq has developed some notable alternatives by oil pipelines passing Turkey, Syria, and Saudi Arabia (Luciani, 2013, p. 91). Unfortunately, all these choices were probably stopped due to the political tension between Iraq and its neighbors.

The region's first main pipeline from northern Iraq to the Mediterranean was called the Kirkuk-Haifa pipeline, and it was operating during the 1930s and 1940s only. In the region, the second substantial pipeline was the trans-Arabian pipeline—Tapline, commissioned in 1950, which linked eastern Saudi oil fields through Jordan and Syria to Sidon in Lebanon, and it was also closed after the 1967 war. Instead of Tapline, Saudi built another pipeline to link the Eastern oil fields with Yanbu oil terminal and refining center in the Red Sea (Cohen, 2015, p. 410). Contrary to energy surplus resources, the Middle East lacks water resources and suffers from water scarcity, which has been a usual source of disputes and wars, this need has stimulated technological novelty in water desalination and reuse (Cohen, 2015, p. 386). In the 1980s, there was a Turkish proposal which targeted to redirect the rivers' freshwater to supply the Levant and the Arabian Peninsula by a project called the "peace pipeline." This project may help the region stable, however the project has not been applied yet (Cohen, 2015, p. 407).

Historically, the energy discovery in Saudi Arabia led to the US's focus on establishing relations with it. In the last WWII session, the US established its permanent military presence by multiple bases in the Gulf region's different states. This involvement has happened gradually since the 1940s to replace the British presence (Klare, 2015, p. 15). The fall of the Iranian Shah and the Soviet invasion of Afghanistan in 1979 produced what the so-called Carter Doctrine related to the Gulf is; the United

States had to be ready to take decisive action. The US President Carter assured its state position; he established a new military division to realize this doctrine called ‘The Rapid Deployment Joint Task Force,’ RDJTF. Carter's successor, Ronald Reagan, improved the RDJTF into a complete regional combat division, the U.S. Central Command, CENTCOM (Klare, 2015, p. 16).

Due to small southern ports, the Iraqi paradox of limited export capacities led Iraqi leaders to wars against Iran and then against Kuwait. Meanwhile, the US's Carter Doctrine was practiced in the Iran–Iraq War's final years to protect Kuwait oil shipments from Iranian attacks. The second intervention based on this doctrine occurred to protect Saudi oil fields and pressure the Iraqis to leave Kuwait (Moran & Russell, 2009, p. 48). The Carter Doctrine can be translated as the following; the Middle East’s energy resources are threatened by controlling the energy flow.

On the other hand, there is a strong association between the oil trade and weapons in the Middle East. In the light of this, major weapons importers are also large oil exporters in the Gulf, and the primary source of these weapons is the largest oil-importing countries in the West (Moran & Russell, 2009, p. 80). Michael O’Hanlon estimates that US presence on the Gulf coast 1 to 2 percent from the defense budget costs $5 billion to $10 billion- per year. O’Hanlon also approximates the US spends $50 billion on the security of the region every year without including the expenses of particular operations such as the one that was ongoing in Iraq, which reportedly expenses more than another $100 billion annually. O’Hanlon adds that the US may subsidize the oil barrels imported from the Gulf by $50 a barrel (O’Hanlon, 2010, p. 60). O’Hanlon’s calculations do not conclude the US's weapons export to the Gulf, which may ignore the proposed subsidy and make a surplus for the US.

Table 8: Summary of the Middle East energy theme

Component
Export's dependency ➔ political instability
Market and Infrastructure Integration prevented
Energy discovery ➔ US military presence ➔ Carter Doctrine
Oil trade ➔ weapons trade

5. Israeli case: Energy, Geopolitics & Security

This chapter links the Israeli case with the theories described in the previous chapter; which will be divided into three sections. The first section analyzes energy security in Israel; it describes energy security components and how Israel deals with them, especially after the natural gas discoveries since 2009. It describes Israeli steps for this transition from energy importer to energy exporter country; how it reforms its energy market as a response to facilitate energy availability? How does it benefit from price affordability after domestic gas consumption in 2013 and skips the price chock after cutting off Egyptian gas in 2012? How Israel set sustainable goals in response to climate changes? Finally, it describes Israeli efforts to meet energy reliability in different dimensions and the challenges it faces to realize that.

The second section elaborates geopolitics of energy in Israel, which focuses on its chokepoint in Eilat. Eilat is connected with Red Sea security and Tiran Strait free movements, especially after transforming the strait into an international strait. On the other hand, it describes the supply chain of energy from Turkey. Finally, the third section studies the role of the security system in Israel in the energy sector. It explains the main threats against Israel by analyzing them from energy perspectives. Also, it describes Israel's heading for building positive peace and capitalized shared interest by trans-border trade, depoliticization policy, and how Israel reshapes its foreign relations depending on the new gas discoveries. This section also studies the liberalism theory to explain Israeli security behavior in the energy sector.

5.1. Energy security in Israel

Israel understands well the Energy Security theory. It practices multiple policies and strategic efforts to meet its energy security by a respectful step. Energy availability has enhanced its natural gas market by changing the gas law to promote international investments and increase competition. Furthermore, Israel increases its dependency to use natural gas in the domestic electricity market instead of other fuels, mainly coal, and increases the electricity usage over the state economic activities. The domestic gas supply in Israel is also linked to **affordable** prices, which is considered a priority for Israel’s national energy plans before 2009 to construct the nuclear power plant. The higher energy costs will make nuclear power a more appealing choice, and the more dependent countries become nuclear power (Pascual & Zambetakis, 2010, p. 10). The affordable prices of electricity are caused by the natural gas imports from Egypt and then the domestic gas discovery. Israel suffered after the Egyptian revolution from price shocks due to the Egyptian gas supply cut-off. And then, it avoided negative impacts depending on the Tamar gas field's operation in 2013.

The **sustainability** in Israel's energy security is self-evident; Israel has pioneered states headed to adopt Renewable Energy RE and Energy Efficiency EE technologies since the 1970s and increased that in the plans and actions after 2009. Benjamin Netanyahu, the Prime Minister of Israel, refers to the importance of one of these plans: “because the addiction to oil has led to the Western world being dependent on the oil-producing countries and harms the standing and security of Israel” (Bahgat, 2011, p. 26). So, Israel's sustainability policy aims to meet energy security and meet state security by decreasing dependence on the oil-producing countries, which is reflected by more independence in its international relations.

Israel does not have many empty areas from the **Geopolitics** perception, whereas the RE project usually needs vast and accessible areas. In this context, Israel faces a challenge regarding renewable energy projects linked to land availability for implementing these projects in densely populated Israel and near the center of consumption areas (Katz & Elkin, 2019, p. 137). Israel's geopolitics must also be considered carefully to meet state energy security, which will make RE plans a dilemma to be implemented.

The reliability of the energy supply in Israel is not part of energy security; it is expanded to be an essential part of state security, from the period of establishment and after gas discoveries. In this context, Israel applies multiple policies such as diversification of energy resources from domestic natural gas fields and foreign suppliers like Russia, Azerbaijan, Iraqi Kurds, or some African suppliers. This policy was expanded significantly after the Iranian Shah collapse in 1979 by importing oil products from Egypt and Mexico and transition to using coal products since the 1980s from multiple suppliers, which was a significant transition in Israeli energy security.

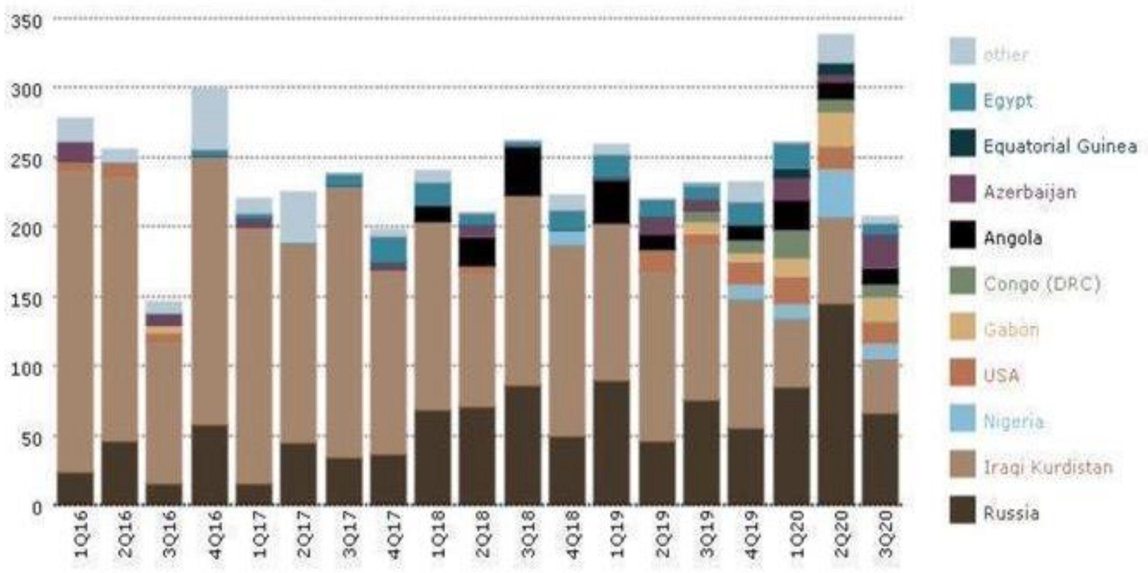

Figure 23: Israel Crude imports diversification, thousand barrel per day 1Q2016-3Q2020 (Al-Tamimi, 2020)

Israel also tries to diversify the energy supply route and chain to meet its energy reliability. It depended on the Iranian oil supply in the 1950s-1970s passed Bab el-Mandeb and Tiran Straits, which was very complex and led to a number of wars and conflicts due to the close of these straits by Israel's enemies. After peace agreements with Egypt in 1979, Israel used the Suez Canal route and Tiran Strait freely. To open a new supply chain via Turkey after the Soviet collapse in the 1990s for importing Azeri and Russian oil and gas supply, Israel was the main part of the infrastructure in the 2000s that carries Caspian energy products. Although Israel decreases its energy products import after domestic discoveries, it still needs free shipping to import other energy needs and vice-versa to export its natural gas.

In developing energy infrastructure, Israel constructs the domestic gas networks to reach all state areas and increase its domestic gas demand. On the other hand, Israel built a Hedera plant in 2013 to import LNG for emergency events, which strengthened Israel's energy reliability. On the export infrastructure, it is known that one of the

Natural gas features is **complicated to transport**, mainly that the gas fields are regularly located offshore and need infrastructure to transport. There was a proposal to construct an onshore LNG export plant that was opposite due to security and local reasons. The new gas infrastructure and shared proposals in the East Mediterranean might still be the targets of militants' attacks in any incoming conflict (El-Katiri & El-Katiri, 2014, p. 43), so that some of these proposals are bending.

Dr. Sohbet Karbuz, a senior non-resident fellow at Bilkent University-Turkey, sees that Israel suffers from a lack of infrastructure to export gas and the weak regulatory and legal framework to encourage big energy companies to invest in Israel. Karbuz predicts that will complicate the gas developments and cause long delays (Karbuz, 2020). The Australian company's withdrawal was considered a commercial indicator that these gas fields need extra investment to be ready for overseas export abilities. Regardless of this complex investment base, the Israeli gas regulator accepted in the 2020 Chevron deal, a US energy leading company, which captures the Israeli gas fields (Reuters, 2020). This enrollment is considered an essential development in persuading international investors in the Israeli gas system.

In this lack of infrastructure to export, it is clear that Israel depends on the regional market to exploit the export benefits. The main supply route of import passes Turkey, while the supply chain of export is linked with Egypt. The energy relation with Egypt repeats the fears of energy dependency, hence Israel may be uncomfortable with the Egyptian export gas monopoly. Although Israel cannot export or exploit natural gas using LNG facilities locally, it inked a **long-term** contract with Egypt to use the EMG pipeline, in order to reduce the export cost in the competitive markets. Additionally, Israel signed a long-term deal to supply Jordan via a new pipeline. Previously the

Palestinians were ready to import the gas, but the political situation canceled this deal before its birth (Rettig, 2016, p. 65).

Ewida sees that Egypt has a crucial gas future in the east Mediterranean, especially after the Zohr gas field discovery, the largest region. So, Ewida adds that Egypt has the potential to shape the gas future independently from other regional players such as Israel, in addition to the well-established energy infrastructure that existed in Egypt (Ewida, 2019, p. 12). In this regard, the EastMed pipeline, to export Israel's gas to the EU via the RoC-Greece route, is crucial for the Israeli energy future to bypass the Egyptian option. There is an emerging dilemma for Israel, the need for long-term relations with Egypt with an uncertainty of future relations. But, Israel's deep interests in the deal settled with Egypt, expressed by the president of Israel's warm letter, Reuven Rivlin, sent to the Egyptian president, Abdel Fattah Al-Sisi, beginning of 2020 after initially exporting gas to Egypt. Rivlin says:

> "Today is a day to celebrate in the history of the relations between our two countries. As I write to you, natural gas has begun flowing from the Israeli Leviathan gas field to Egypt, linking our two countries and our two peoples. The flow of gas brings with it not only benefits to our economies but also makes real the connection between Egypt and Israel after over 40 years of peaceful relations. Mr. President, the State of Israel sees our relationship with the Arab Republic of Egypt as a strategic asset. It is a vital component of regional stability and an example of what is possible in future relations across the Middle East" (Rivlin, 2020)

In this context, the plan of Shimon Peres, a former prime minister, can be understood in his book titled 'The New Middle East' which discusses the peace plan. Peres' plan for the new Middle East in the 1990s was partly to develop this poor infrastructure with Israel's neighbors, he proposed to link the Middle East countries by an oil pipeline, but the Palestinian peace process failure freezes this plan with Arab countries. Eastern Mediterranean energy infrastructure's challenge is the main goal for the new energy forum in 2019 called "East Mediterranean Gas Forum," EastMed, in Cairo by Greece, Israel, RoC, Egypt, Jordan, Italy, and the Palestine Authority.

Israeli representative in this forum is the Ministry of Energy as a leader of foreign energy affairs. EastMed forum should have become a potential organization regulating the region's common gas market, making the EastMed project competitive in the worldwide gas market (Atmaca, 2019, p. 4). On the other hand, the EastMed pipeline, as explained by Retting in the Webinar discussed the project, needs many complex technologies to construct the deepest longest submarine gas pipeline worldwide. This challenge is considered as a new adventure for Israel (Retting, 2020). In this regard, Israel is very interested in welcoming and promoting international energy companies like Chevron and others to invest in its gas projects. The principal notice on this forum excludes Turkey's leading regional energy player, which is considered in response to the EEZ disputes and expanded to tension with the RoC-Greece alliance. Additionally, it excludes Syria and Lebanon as regional Iran's alliance.

Karbuz mentions that the most relevant question regarding the EastMed pipeline is whether Israeli gas could be competitive in terms of landing prices in Europe via that pipeline. He predicts that the response is that the plan is to put the pipeline online by the end of 2025, but then another question arises: does Europe, after 2025, need additional gas? He clarifies his concerns by describing what is happening in Europe regarding the decarburization policies and the growing diversification of the European gas supply through LNG (Karbuz, 2020). So that, the feasibility of the EastMed pipeline depends on future development. This development of infrastructure was assured in the Webinar held last July 2020 by European Council on Foreign Relation ECFR. The speakers mentioned that the marketplace would determine the EastMed pipeline’s future and success (Aydintasbas, et al., 2020).

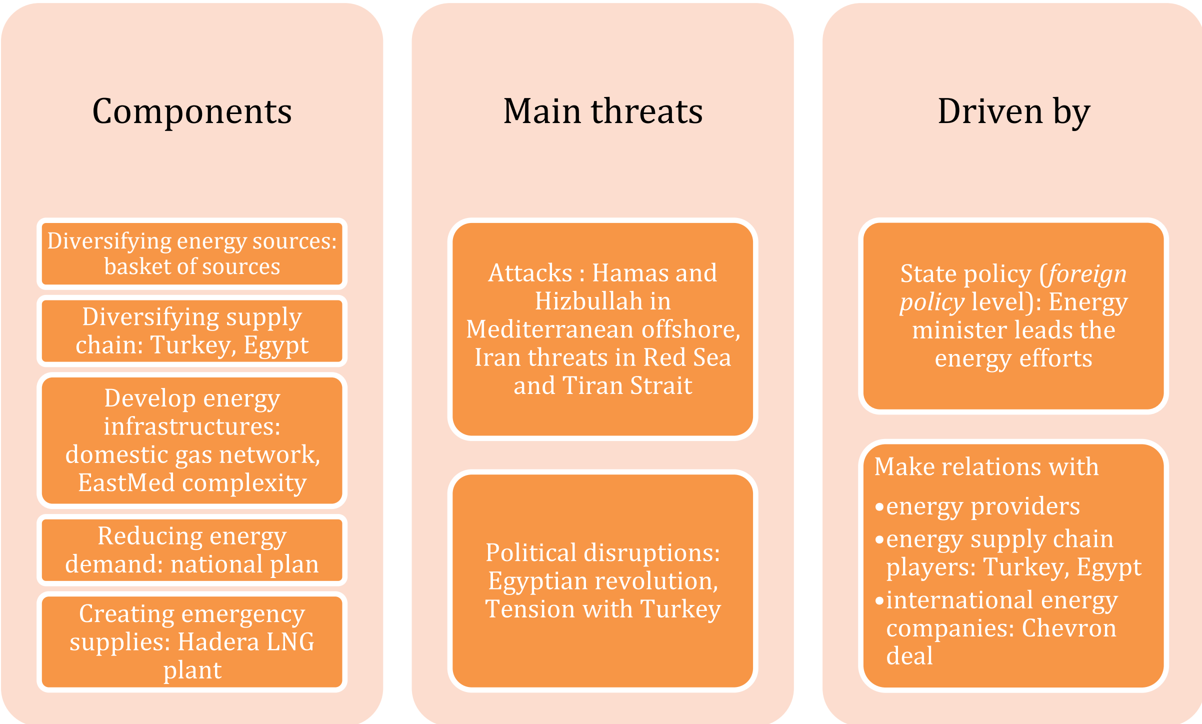

Figure 24: Summary Reliability of Energy in Israel

Furthermore, the US will maintain Israel's energy security and energy reliability, which is considered the continuity of obligation since Egypt's peace agreement to cover any shortage in energy supply after relinquishing oil fields in Sinai. The US also increased its considerations in the Eastern Mediterranean region, when the US Congress passed a Decree to prioritize RoC's stability by a vast majority to the US continuity of arms and intelligence activities (El-Katiri & El-Katiri, 2014, p. 44). On the other hand, Israel consolidates its relations with RoC on a different dimension; Israel agreed with RoC on the option of using RoC's airfields, which is considered as adding strategic essential depth in case of emergency and future escalation, such as with Iran or its alliance (Nathanson & Levy, 2012, p. 63). Meanwhile, Israel, RoC, and Greece represent a new regional alliance depending on a shared interest in export gas to the EU. To secure the gas fields, especially at emergency times, Israel may request US support to maintain the gas shipping and exporting like what the US did for Kuwaitis in the 1980s.

Finally, it can be understood that Israel considers energy reliability as the main priority to meet its energy security; Israel is a military state so that energy reliability is a "life and death" issue for its economy and military actions. The domestic gas fields are offshore, so it needs a lot of effort to protect them from foreign attacks. Additionally, political instabilities in the Eastern Mediterranean region were tested after the Egyptian revolution and Mavi-Marmara events. Sustainability is coming as a second priority in meeting Israeli energy security. It also assists the energy reliability by developing domestic energy supply via RE generations, decreasing the import of energy and dependency on others. The sustainability goal is to diversify and lessen the energy dependency more than meets the international heading for green energy. Energy affordability and availability, the two-face coin from the Israeli perspective, are the last priority in Israeli energy security since they mainly impact the economic side more than the state's security. This not means that Israel neglects the economic side, but it makes reliability a strategic state security need.

5.2. Geopolitics of energy in Israel

As described in the **Geopolitics** of Israel section, Israel made some action to **advance** its resources interests. For example, in the 1967 war, Israel's invading the Golan Heights and the Sinai Peninsula are advancing its resource interests besides military perspectives. The occupying Golan facilitates the reaching of water resources, whereas the control of Sinai offered an oil supply at an affordable price. On the **chokepoint** concept, Israel used Eilat port to import the Iranian oil passed through Tiran strait to bypass the blocked Suez Canal before 1967. The Israeli decision to go to the 1967 war and control the Tiran strait was, in reality, a response to protect the oil supply. On the other hand, Israel uses the Turkish routes to import Russian and Azeri energy products. In this context, Israel needs to stabilize its relation with Turkey, although some tensions, especially after the Mavi-Marmara events in 2010.

The Tiran chokepoint must receive more consideration from Israeli decision-makers. After the Egyptian revolution and instability status in Sinai, David Wurmser adds Iran’s existence of naval forces and its supported militia in Yemen in the Red Sea, which would be changed to be a strategic challenge and needs Israel’s naval attitude and doctrine (Wurmser, 2013, p. 23). This Iranian existence may be consolidated; Egypt's parliament accepts islands to deal with Saudi Arabia in 2017 (Arabia, 2017) transfers Tiran Strait from the Egyptian strait to an international strait. Iran could use this international strait to make any operation against Israeli energy assets in Eilat like the Eilat-Ashkelon pipeline, which may threaten its energy reliability. On the other hand, Israel benefits from transforming the Tiran strain to be an international strait. This transformation makes shipping through it free from Egyptian control, including the energy supply chain.

The supply from this strait is little after 1979, but the United Arab Emirates UAE's new agreements may give it life. Tiran strait is the main **chokepoint** for Israel and the energy export option to the south and Asia if there are any opportunities. This strait will play a significant role, especially after the strait changed into the international strait and the 2020 normalization agreement with UAE, Bahrain, and Sudan. Moreover, energy products can be shipped from those countries through the Tiran strait to compensate for any Turkish route shortage or cut-off. It is a vital corridor to secure Israel and Israel's energy reliability and maintain its accessibility. Whereas Dr. John V. Bowlus, Lecturer at Kadir Has University-Turkey, does not see any concern about interrupting the oil import via Turkey. He explains that the “oil is traded globally” and adds that Israel can import oil or energy products from anywhere else, not considering Turkey a hub of Israeli oil (Bowlus, 2020).

5.3. Security of Israel and Energy Issues

As mentioned previously, energy security is part of state security in Israel. Israel's security regularly develops since the state’s establishment due to wars’ lessons and emergency events. Although Israel considers itself a democratic state, the army’s role goes beyond its role in the democratic system (Cohen, 2007, p. 37). Israel's studying is not talking about a traditional democratic state but rather about a security state. In this regard, the energy sector must be controlled by a security system, it is not only handled, but it is also affected by its security system and vice-versa.

Alon Paz defines Israel as actively engaged in different separate protracted conflicts. In the south, it faces Gaza’s Militant of Hamas and Jihadist in Sinai. In the northern, it faces Hezbollah and Syria’s Jihadist militants. Additionally, the Iranian threats existed in Syria, which linked Iranian nuclear capabilities (Paz, 2015, p. 15). In addition to Paz's vision, it cannot be ignored that Israel has not reached a final peace agreement with the Palestinians which increases the complexity of Israeli conflict management. These conflicts can be interpreted as threats. In contrast, Gadi Eisenkot, a former Israeli Chief of Staff, confirms that the Israeli army will not allow the continuation of an existential threat to Israel (Besharat, 2019). Eisenkot wrote a policy paper cooperated with Gabi Siboni after his retirement in 2019 to describe the external threats of Israel naturally as the following:

> "**Conventional threats** from state militaries or non-state organizations operating like state militaries. **Nonconventional threats**, mainly consisting of efforts to achieve military nuclear capabilities. **Sub-conventional threats**, which include guerrilla warfare and terrorism from actors both within and outside Israel. **Cyberspace and information threats**. Alongside these, **internal challenges and threats** to Israel center on an erosion of solidarity among segments of the population, damage to belief in the justness of the Zionist cause, and a weakening of the internal legitimacy of Israel’s actions" (Eisenkot & Siboni, 2019, p. v).

Eisenkot and Siboni see that the conventional threat is not ended, but the sub-conventional threats are increased and occupy a good position against Israel. In the energy sector, Hamas or Hezbollah activity against gas or energy assets will disrupt energy supply but decisively not affect the energy reliability. Also, the infrastructure may be considered an easy target for the enemies’ attacks from Hamas in the South offshore or Hezbollah in the North offshore. Still, energy threats can be understood based on explaining what happened between Iraq and Iran during the 1980s. Although this war was a conventional war, the Iraqi oil pipeline had been repeatedly targeted by Iranian aircraft. Still, Iraq could repair the damage quickly, those attacks never made any difference to the Iraqi export rate (Luciani, 2013, p. 53).

What would assure that? After the Egyptian revolution, the attacks against the gas pipeline in Sinai did not make a significant gas cut-off until Cairo formally decided. Israel suffered from the cut-off since it had no other reliable alternative. Like what happened when Egypt closed the Tiran strait and stopped the oil supply, the conventional threat is returned by Iran forces that existed on the Red sea, as described previously. On the other hand, regarding the energy and gas assets and infrastructures, the **cyberspace** and information threats, based on Eisenkot and Siboni, increased in this regard, to control and damage them that will reflect poorly on continuity of energy supply and export.

David Ben-Gurion, the godfather of Israeli security doctrine, believes that any war cannot be financed without a well-established economy on the war theme side. It requires the shortest period of wars with at least effort since it does not have many resources without friendly neighbors, especially in the state establishment periods. Also, the economic outlook requires adequate protection for economic production centers and the continued necessity of continuing production under all circumstances at the highest capacity, during wars or emergencies. So, Israel applies the **Quick war**, which came as an economic necessity above all (Sheikh, 2019), to make its military goals with minimum resources and limited time. The main resource that drives wars is energy, where Israel traditionally suffered from energy scarcity or poor regional infrastructure.

On the other hand, Israel formulated its strategy on **periphery** countries in the 1950s. This strategy, which was aimed toward breaking the regional isolation, included acknowledging the role of Israel in establishing relations with minorities in the region (Lindenstrauss & Eran, 2014, p. 87). Israel started this policy among the ‘non-Arab’ periphery, mainly Iran, Turkey, and Ethiopia, against the Arabs. Contemporary Israel builds a relation with Azerbaijan as the periphery state of Iran, primarily importing energy products via Turkish routes. Besides, Israel makes good relations with Kurds in Iraq and Iran that facilitate the Kurdish oil-importing via Turkish infrastructure (Kamisher, 2016, p. 9).

From energy perspectives and after the gas discoveries, Israel made a new heading in periphery policy by building long-term relations with Greece and RoC, which may be classified against Turkey depending on the EEZ tension. Any escalation in RoC or Greece's conflicts with Turkey will put Israel in a critical position since it supports the RoC and Greece claims. A pro-Arab position was historically reflected by these two Mediterranean states, which changed focusing on close cooperation plans with Israel, especially in gas developments (Joanna Dyduch, 2018, p. 139). Meanwhile, the EastMed pipeline may be considered a threat to Turkey's position as a hub or transit country of gas supply to the EU from the Caspian region or Russia.

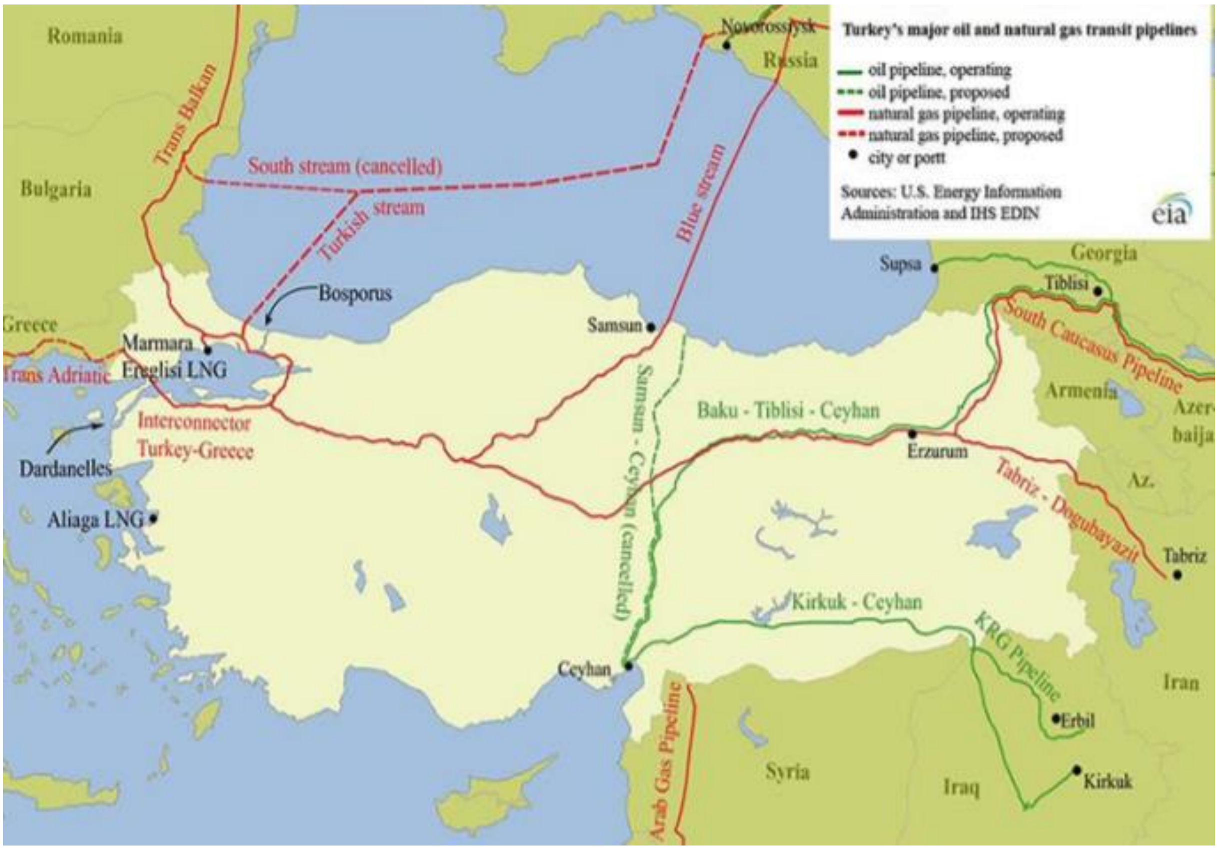

Figure 25: Turkey's major oil & gas transits pipelines making it an energy hub country (Kamisher, 2016, p. 4).

Despite the periphery policy, Ben-Gurion explained that Israel could not end its conflict with neighbors only depending on military means. Israel is regularly heading to **make peace** with its enemies. Leading to peace started in the 1970s with Egypt, followed by the Palestinian and Jordanian sides in the 1990s paralleled a frozen negotiation with Syria. Tal defines the need for peace in Israel; he explains the status of the "few against the many" (Tal, 2000, p. 41). The peace from an Israeli perspective is combined with **Traditional liberalism or Kantian liberalism** thoughts that call for establishing positive peace; Emanuel Kant, as a father of this school, distinguished between the positive peace in liberalism theory and the end of the war (Navari, 2008, p. 31).

Liberalism supports building a positive peace to ensure your security. This positive peace means including economic and energy cooperation. But this peace is incomplete since Israel cannot reach just peace with Syria and even with Palestine. This political failure may be remembered as a historical Political failure after WWI, which led to the successive wars (Williams, 2008, p. 154). The Israeli-Palestinian peace process is vital to meet the Israeli vision of peace realizing security.

In the Palestinian Israeli peace process, the energy was mentioned in a historical Declaration of Principles signed in 1993, later known as the Oslo agreement. In annex III of this declaration, named Protocol on Israeli-Palestinian Cooperation in Economic and Development Programs, Palestinian and Israeli agreed to cooperate in the energy sector, mainly for “exploitation of oil and gas and construction pipeline networks and utilities” (Principles, 1993). As part of the peace process, this vision of energy cooperation is continued by the international players. The US Secretary of State, John Kerry, proposed in May 2013 a plan designed for the enhancement of the Palestinian economy. Part of this plan was to increase the economic transactions between both parties by swap agreement of natural gas between Israel and the Palestinian, which included the sale of Israeli gas to PA territories in the West Bank and sales of Gazan gas to Israel (Even & Eran, 2014, p. 200).

The major challenge of Kerry’s plan was the Hamas movement, whose power is based in Gaza and is not recognized by the PA as part of the gas swap plan (Henderson, 2014, p. 9). This plan was considered as a foundation for a conflict resolution between the Palestinians and Israelis. The Quartet, established in 2002 to support the peace process by UN-US-EU & Russia, was part of this plan's implementation and development (Henderson, 2014, p. 8). This plan is also considered part of capitalizing the shared area of interest to facilitate the political settlement.

Despite the peace process's failure, Palestine is still part of the EastMed forum, and Palestinians are still under complete Israeli control regarding the energy supply. In that sense, Israel somehow is using and will continue to use the energy as a weapon against them. Meanwhile, Israel also used an anti-Palestinian energy weapon (Escribano, 2008, p. 30) by minimizing fuel supply to Gaza, especially at tension time, and controlling the supply capacity to West Bank areas. Nevertheless, Palestine is the potential market for Israeli energy supply, i.e., Israel supplies the Palestinian market with all fuel products and electricity. Anyway, Israel still uses energy supply as a weapon against Palestinians, but also it needs them as part of their energy customers.

Previously in the Palestinian peace process, Israel thought of capitalizing on Egypt's shared interest after the Camp David agreement, especially in the oil and energy cooperation. In the final negotiation with Egypt, Israel believed that oil cooperation would help make a new economic system in the region, rooted in cooperation instead of conflict. Israel links the peace treaties with Egypt by energy cooperation. Yuval Steinitz, Israel's Minister of Finance in 2012, explained the cut-off gas supply from Egypt after the revolution as: ‘‘a dangerous precedent that diminishes the peace treaty’’ (Shaffer, 2013, p. 122). He defines that Israel does not need any peace; it requires a positive peace with full cooperation.

Peres adds that Peace hope will reshape the Middle East; Israel's main benefit is the Arabs’ acceptance of Israel as a state with full rights. Peres says that this peace will produce a new theme of cooperation, not only with Israel's close neighbors but also with other regional states. Peres also calls for '**Regional organization**' as key to meet peace and security (Peres, 1993, p. 61). He mentions a Turkish proposal in 1987 to establish a regional network to enhance the **Trans-border economic transactions**, which was refused by Arabs (Peres, 1993, p. 129). Peres adds that the regional network will carry water, oil, and gas between regional countries (Peres, 1993, p. 128). Peres' plan translated to the EastMed forum for gas projects cooperation, including most of Eastern Mediterranean countries.

The **Commercial Liberalism theory can explain the trans-border economic and trade policy of Israel**. Commercial Liberalism**,** as defined by Andrew Moravcsik, focuses on making "incentives created by opportunities for trans-border economic transactions" to make the state security. Moravcsik thinks that "trade is generally a less costly means of accumulating wealth than war, sanctions or other coercive means" (Navari, 2008, p. 32). Furthermore, liberalists call for establishing the institutions to capitalize on shared interests between members. According to Robert Jervis, "states will establish an institution if and only if they seek the goals that the institution will help them reach." (Navari, 2008, p. 41). In this context, the EastMed forum realizes the concepts of Commercial Liberalism.

Even though Israel prefers to make a positive peace with other states, Israel cannot apply this concept in some cases. So instead of positive peace, Israel applies the separation between the economic and energy relations and the political issues, which can be seen clearly in the Israeli Turkish ties since the Mavi-Marmara attack in 2010, where Israel continues to benefit from Turkey’s energy route. Bowlus guesses that Israel and Turkey will stay at odds politically, “unless there is a change of leadership in Turkey.” He adds that “if Turkey becomes even more isolated, it may be forced to change, and a better relationship with Israel seems possible”. Bowlus sees that “there is no longer a reason for energy cooperation between the two countries" (Bowlus, 2020). Turkey-Israel's relations are in the cold in this period at a political level. This unique relation might also be explained as part of **the Depoliticization theory in Commercial Liberalism to maintain the economic relations out of the political tie**s described by Wilhelm Röpke, the German economist. Röpke calls for "the widest possible separation of the two spheres of government and economy." In other words, he advocated the **'Depoliticization'** of the economic sphere as far as possible (Navari, 2008, p. 34).

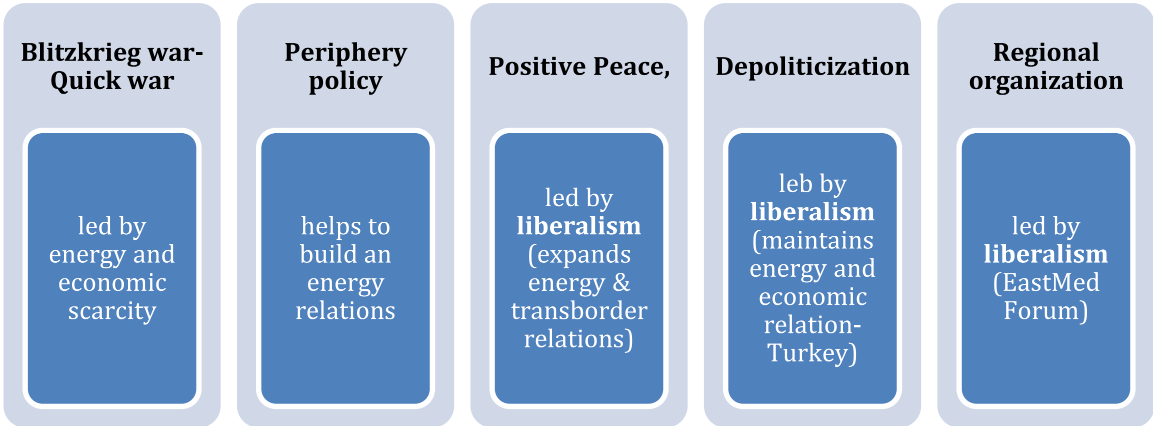

Figure 26: How Israel's security system impacts the energy sector?

After gas discoveries, Israel's security system's significant development is expanding Israeli naval forces' new dimensions. In this regard, the energy discoveries need a new approach of increasing capacity to protect the sea's new infrastructure by naval forces. Rettig explains that Israel's strategic perspective considered the sea a secondary, and Israel's maritime policy was never established. Besides, Rettig adds that Israel's navy has historically been the least financed than other military branches. However, sea routes carry Israel's international trade by 99%, 70% of its population lives close to the sea, and much of its vital infrastructure is situated on its shoreline. Rettig elaborates this ignorance since the sea did not threaten Israel, and its neighbors have conventionally made marginal intentions regarding the naval forces (Rettig, 2016, p. 4).

Following the gas discovery, these perceptions drastically shifted in the Eastern Mediterranean region. Rettig believes that Israeli decision-makers were keen to identify the state's EEZ and exploit the gas deposit, which makes an essential reflection of the increase in the Israeli naval budget and new recruitment. More notably, this pours the attention to the western boundary with an emerging region and, more precisely, with RoC, a nation with the ability to become a significant trade and diplomatic partner based on Rettig predictions (Rettig, 2016, p. 4). Israel's maritime area, including its EEZ, is approximately 26,000 square km in size larger than the land area of the state (Teff-Seker, et al., 2018, p. 614).

In the gas context, the Israeli government announced in 2013 that its navy would be mobilized to protect any possible threat to the gas platforms and facilities. For this mission, the navy was also set to run several other programs, including unmanned aviation vehicles with advanced systems, capable of supporting this effort. This weaponization was also considered Israel's attempts to deter the provision of weapons to its non-state rivals, Hamas, the Islamic Jihad, and Hezbollah (Teff-Seker, et al., 2018, p. 626).

In the light of fears that could be targeted with anti-ship rockets or warships filled with bombs, Israel is proposing relying on the "David's Sling counter-missile weapon" for protecting offshore gas assets, built by Rafael Advanced Defense Systems. The David's Sling has been operational since 2013, but Iron Dome, another Rafael air defense system, has already been deployed (Writers, 2012). Drones have also been used to secure the northern fields, and a large portion of the activities of their missile boats will be dedicated by the navy to surveillance and protecting the fields (Nathanson & Levy, 2012, p. 51). Ewida adds that the Israeli navy requested a $700 million increase in its budget for developing its systems and $100 million for repairs annually from 2013. The rise was linked to the need to protect the growth of oil and gas security (Ewida, 2019, p. 80). This new armament will form a disincentive mechanism against possible threats to maritime sites and economic facilities, particularly to Iran and Lebanon's Hezbollah (Ewida, 2019, p. 81).

Additionally, four small diesel-powered frigates were ordered in 2018 by the Israeli navy, which will indeed be developed at Germany's subsidized rates. However, these will be mainly used to protect Israel's offshore gas installations (S. Brower, 2018, p. 46). The weaponization is the same reaction of energy-rich states. For instance, the largest oil exporters in the Gulf are also essential importers of weapons (Moran & Russell, 2009, p. 80). According to World Bank data, Israel increased its arms import since the gas discoveries time by an average of 231%. And the military expenditures increased from 14$ billion to $20 billion in 2018. The share of these armament actions decreased referred to GDP, linked with the surplus wealth that happened in the state after gas discoveries.

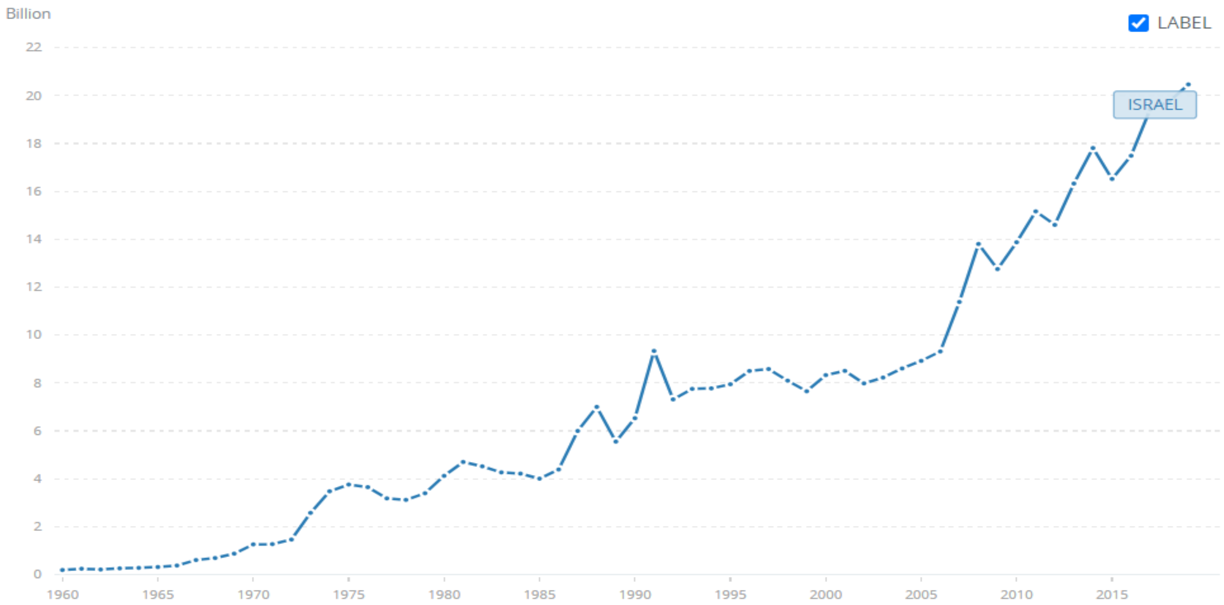

Figure 27: Growth of Israel expense of Defense 1960-2015, high rate after gas discoveries (WorldBank, 2020)

6. Conclusion

The Thesis evaluates Israeli natural gas discoveries after 2009 and how it shapes its security, relations, and future. The Thesis's main question is — ***What is the impact of energy discoveries and supply on Israel's state security?*** The theoretical framework applies depending on energy security and geopolitics of energy literature, which defines the state's role to secure energy resources and the effect on the state's relations security vise-versa. Energy security is essential for state life, whereas geopolitics of energy are associated with understanding the relationship between energy resources' locations and security issues. Traditionally, Israel is affected by the energy sector and thus it forms its relations with neighboring states and others depending on the cooperation in the energy sector; this would also be its future behavior and policy. Israel is not a new energy player, i.e., it adapts and alternates its relations with deep thinking and linking with energy.

As for the Eastern Mediterranean regional relations, energy cooperation drives Israel changing relations. Cold traditional ties with Greece and RoC are modified to warm for developing natural gas fields by initiating the EastMed pipeline project, exporting gas to the EU via the RoC-Greece route, and establishing the EastMed gas forum with other regional countries of Egypt, Palestinian Authority, and Jordan. These changes in relations are consolidated by a mutual interest in natural gas exploitation and hope to enroll in the competitive market of the EU. This relationship builds a new gas exporting route other than the current market in Egypt or Jordan since Jordan has a small market and Egypt has its natural gas fields.

The EU needs the EastMed project to meet its energy diversification policy in gas import other than the Russian or Turkish options. In this context, the EastMed project may get informal opposition from Russia since it will not welcome a new competitor in its gas market in the EU. So that, Russian existence in Syria and its positive relation with Turkey could deserve the EastMed project. On the other hand, any conflict escalation between RoC or Greece with Turkey or building the EastMed pipeline despite Turkish favor will put Israel in a critical situation with Turkey. Turkey also sees the EastMed pipeline as a threat for its EEZ, which may trigger the conflict regarding the Cyprus question between Turkey and Greek-RoC parties, especially after unilateral agreements to determine EEZ East Mediterranean. The newly established forum, EastMed, excludes Turkey, Syria, and Lebanon. The gas will shape the future relations maps.

Furthermore, the EastMed pipeline may be considered a threat to Turkey's position as a hub of energy and gas supply to Europe via Russian and Caspian areas. This future poor relation with Turkey or Russia is expected by Israel based on its energy perspectives. In this environment, Israel is going forward to build official relations with oil-rich countries in the Gulf, like UAE, to compensate for any oil or gas supply shortage via the Turkish supply chain. On the other hand, Israel maintains its depoliticization policy with Turkey to separate political and economic levels after the Mavi-Marmara event in 2010. This policy secures the Turkish energy supply chain so far and diversifies its import, especially after the Iranian Shah's collapse in 1979. Additionally, it increases its renewable energy shares in the energy mix. RE is the central part of Israeli energy plans, which secure domestic energy production independently on conventional resources and meet international standards to fight climate change.

Under these new complex conditions, Israel has seen an opportunity to improve economic and political alliances with Europe by constructing the EasMed pipeline, which is part of "pipeline diplomacy" (Rettig, 2016, p. 4). Opening the door to new cooperation between the EU and Israel in the energy sector will make their relations more consolidated and increase their interest area. Furthermore, gas will shape the future relations maps, with that the EastMed pipeline will improve and promote economic ties between the EU and Israel and reflect at a political level. Israeli-Greek relations are also enhanced based on energy cooperation other than the EastMed pipeline. The “Karish” and “Tanin” gas fields in Israel are developed by the Greek company, Energean since 2018 (Energy, 2018, p. 13).

Israel usually capitalizes its shared interests and increases trans-border transactions to consolidate its foreign relations by energy relations which are occurred through peace agreements. Israel is eager for positive peace, in the liberalism theory, that means returning warm relations with Egypt after the revolution tensions’ period in 2011-2013, which is crowned by agreements of exporting gas from Israel to Egypt. Positive peace with Egypt also helps Israel develop and utilize Egyptian energy infrastructure, such as the EMG undersea pipeline, which increases Israel's gas export under the lack of this infrastructure in Israel.

In this regard, Egypt will serve the gas developing plans as Shaffer described, and Egypt's gas infrastructure compensates for the current gaps in Israel. Under no peace agreement with Syria and Lebanon, Egypt is the main route to realize Israel’s gas sector development. Furthermore, instability in Lebanon and Syria still serves Israel's exploitation of the gas fields despite having no agreements on their EEZ and makes Israel free shipping and investments in the sea. That being said, the relations between

Israel and Egypt are the only clear ones in the region. Israel’s energy security is affected deeply by the Egyptian position in wars and peaceful times. Meanwhile, from Israel's point of view, the EastMed pipeline is crucial for the Israeli energy future to make alternatives for Egyptian options by a strategic route, which meets its gas clients' diversifications. After all, Israel is still eager to implement the EastMed project or create another smart solution to meet this diversification.

In a peace context, despite that Israel signed Oslo Accords in 1993 with Palestinians, including a part about energy cooperation, Gaza’s gas field development and the energy relation with Palestinians are still frozen. However, Israel still uses energy supply as a weapon against the Palestinians in order to control their energy needs. This does not prefer to develop Gaza's natural gas field under fears that Hamas may control gas revenues. On the other hand, it also needs them as part of their guaranteed electricity customers and in hopes for them to be a gas customer. So, in other words, the Palestine question is still without an agreed settlement. This relation will not change under current Palestinian capacities that limit their efforts to meet energy independence, which requires a sovereign state and complete control in the ground and borders.

After all, Israel is going forward in a positive peace that combines its energy interest. This peace was translated by Ariel Sharon’s statement, Israeli Minister of Agriculture, when he told Carter during Camp David's negotiation with Egypt in 1979: "We are going toward true peace. We don’t accept any restrictions on selling oil to Israel" (Rubinovitz & Rettig, 2018, p. 7). Still, Israel is not interested in a positive peace with Syria, Lebanon, or even Palestinians; Israel realizes its energy interests without cost. In Palestinians, it delays the development of their gas field, guarantees their customer relationship, and controls the supply for them politically, serving the energy plan in Israel without a peace cost.

On the threats side, it is clear that Israeli energy security's main threats, based on Eisenkot and Siboni's definition, are not coming from sub-conventional threats of militants like Hamas or Hezbollah. They can’t control the Israeli energy routes or supply chains in the Mediterranean offshore. They can do limited interruptions in energy supply, like cyber threats or damaging pipelines or networks, but clearly, they will not be vulnerable to energy supply. The maximum action from Hamas or Hezbollah may be to cut off some gas or oil pipelines like what happened in Sinai after Egyptian Revolution in 2011, and Israel will be able to deal with it. In the meantime, Eisenkot and Siboni consider any development in Lebanon or Palestine's gas fields, presenting significant challenges to Israel's freedom to ship and protect economic interests (Eisenkot & Siboni, 2019, p. 23). This development may get legitimacy for militant’s actions against Israeli gas fields or shipping routes, which Israel must reject at all.

The main threats of energy in Israel are still the conventional threats of states such as Iran. Iran's activities in the Red Sea, where it existed to support Houthis in the Yemen war, may stop shipping in the Bab el-Mandeb and Tiran straits. This aggressive behavior can interrupt the supply of energy products to Israel by this southern route, especially after the Tiran Strait was transformed into an international strait. The conventional threats may also happen even by peaceful states like Egypt or Turkey, conditioned by considerable regime changes. This political position may also stop the energy supply chains from or to Israel. They can control the main Israeli supply chains; Egypt can interrupt energy shipping in the Tiran strait, Suez Canal, or exporting gas in the East Mediterranean, while Turkey can cut-off the BTC supply or Bosporus energy ships. Besides, Turkey still rejects the EastMed project and makes unilateral energy activities in the disputed EEZ, which is raising fears about the EastMed pipeline's future under this environment. The states' threats will not offer Israel multiple choices to meet its energy security and stimulate the need for wars to skip these threats, remembered by what happened in the Six-Day war.

Upon this fear of future energy wars, Israel will use the gas revenues and economic benefits for enhancing its capacities and capabilities to secure its energy resources and supply chains. Israel increases and priorities its Weaponization policy, particularly in naval forces depending on the sea importance for future war. Furthermore, Israeli naval forces suffer from ignorance compared to other forces, which changes after gas discoveries on its water to cover these gaps. In this context, Israel is increasing its weapons capacity, especially as part of the powering naval forces policy and protecting its offshore assets. The Israeli army is conscious that the development and discovery fields will have to be secured by diversifying army tools using drones, Iron Dome, or traditional frigates' weapons. In contrast, the increased consideration of the sea also reflects Israeli relations by consolidating its relations with RoC at a military level that permits using RoC's airfields in emergency times.

On the other hand, Israeli export weapons have increased since the gas discoveries, associated with enhancing industrial competitiveness and affordable energy prices. This additional wealth and revenues might fund the military capacities. The increase in domestic gas consumption decreases energy prices, especially for industrial sectors in Israel and weapons industries and exports. This affordable price would affect Israel's exporting balance by improving Israeli competitiveness worldwide and raising global market share (Energy, 2018, p. 15).

Table 9: Threats of energy discoveries based on Eisenkot & Siboni theory

Threats	Risk rate	Current Actor	Effects on	Israel's response
Conventional	High	Iran	The Red Sea & Tiran Strait routes	Naval weaponization
Sub-conventional	Medium	Militant; Hamas, Hezbollah	Mediterranean routes and infrastructure	Drones, Iron Dome, new military relations with RoC
Cyberspace	Medium	Hackers	Operational damages	Cybersecurity
Conventional	Low	Egypt, Turkey	The Red Sea & Mediterranean routes	Naval weaponization, new relations with UAE

But how will these gas economic benefits impact the future Israeli wars? Israel, after gas discoveries, is more stable on the economic side than before. It traditionally suffered from resource scarcity and depended on importing. It applied the Quick War theme, Blitzkrieg war, to meet its war's target in minimum resources and time in isolation ground. Israel believes that a fundamental national security weakness has been solved. It eventually discovered its energy source and was freed from the volatile regional status's challenges (Sachs & Boersma, 2015, p. 11) in the energy sector. This development may be giving Israel the feel of freedom and encouraging it to practice long-time wars instead of quick wars.

Despite these threats mentioned, which may lead to energy war, still Israel does not prefer wars after the gas discoveries to protect foreign investors' promotion in the gas sector. Instead, it favors developing its relations at the expense of wars to maintain and raise its credibility and competitiveness in the international gas market. In this environment, Israel in 2020 changed its last stand to skip IEA's participation, it submitted its request for full membership in IEA, which was approved initially to proceed for full membership as announced by the Israeli Ministry of Energy (Ministry of Energy, 2020). This step is essential to enhance market transparency, apply international standards in the energy sector, and publish foreign investors' data.

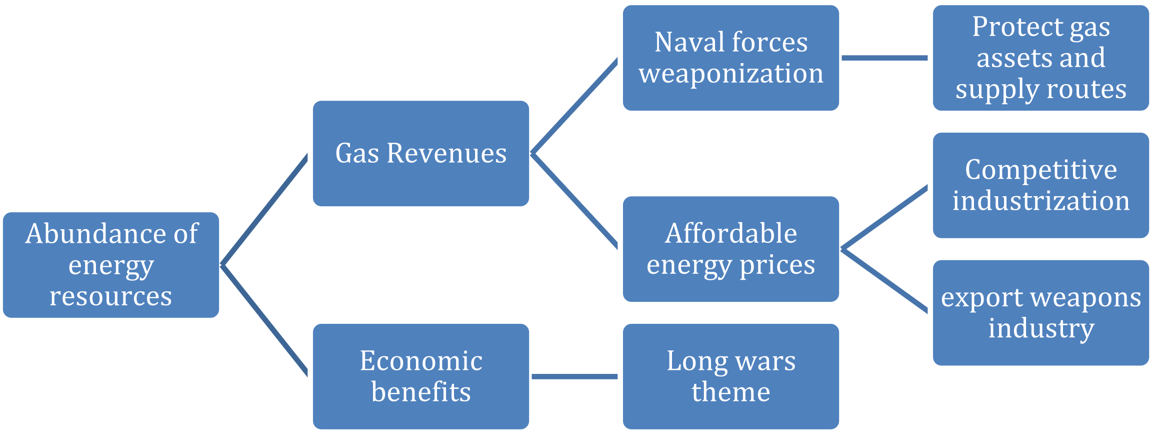

Figure 28: Summary of Economic benefits and impact of Gas Discoveries

Any war for Israel is not an easy choice, especially under conventional threats. Moreover, Israel benefited in the past from US cover in the last conventional threats in the 1973 war, also the US facilitated the Egyptian Israeli negotiation by getting Israel the energy guarantee after 1975, which was used to meet Israel's energy security. The US will maintain Israel's energy security and energy reliability, considered the continuity of their special relations. This US intervention is a reality, the Congress Decree in 2019 to support RoC combined with the Eastern Mediterranean region's energy security.

In contrast, the US support for Israel is more profound and traditional than with RoC. In this context, Israel may also request US support to secure the gas supply and investment like what the US introduced for Kuwaitis during the Iraqi-Iranian war in the 1980s. After all, under full-scale war or war from multiple directions like what happened in 1973, Israel will not make victory without international interventions that protect this small country with its small capabilities. The US role would approve the external player's importance in securing Israeli energy needs; Israel did not accept to continue in the peace process without this external player role again.

Table 10: Summary of Energy relations with leading players

Player	Energy relation after 2009
Egypt	Utilize the well-established Egyptian infrastructure, exporting gas, temporary route to EU by LNG, threats from political instability, part of EastMed forum
Palestine	Delays gas fields development, guarantees customer, control supply, part of EastMed forum
Turkey	Maintains energy supply by Turkish routes, depoliticization relations, excludes from EastMed forum
Greece	Transfers Cold relations to warm relations depending on energy cooperation, part of EastMed forum
RoC	Transfers Cold relations to warm relations depending on energy cooperation, increase military cooperation, part of EastMed forum
Syria	No peace, excludes from EastMed forum
Lebanon	No peace, delays gas development, no EEZ delimitations, excludes from EastMed forum
Russia	Opposition EastMed pipeline informally, a threat by its existence in Syria
EU	Support EastMed pipeline to meet its energy security
US	2019 congress decree, support RoC, energy companies' investment

Finally, Israel is imbued with an understanding of energy security and geopolitics of energy theories. In energy security, it modifies its energy regulatory frameworks to make a competitive energy market and lastly be part of IEA, which is making energy available. It also increases its RE share to meet sustainability and international heading to face climate changes. Furthermore, it benefits from new gas discoveries by energy affordability prices, which compete in its export share by increasing industrial productivity free from high prices. However, the foremost step and effort for Israel are to meet energy reliability.

Israel diversifies its energy resources and supply chains, develops its energy infrastructure and regional energy interdependency, sets a national plan to decrease its energy demand by EE goals, and constructs an emergency system. These energy reliability efforts face Militants attacks' threats like Hamas or Hezbollah and political instabilities in regional countries such as Egypt after the revolution in 2011. In this regard, Israel is motivated to increase its weaponization activities, especially in naval forces that protect its energy assets in water. On the other hand, it secures energy supply routes, from geopolitical perspectives, such as Eilat port via Tiran Strait that may be a threat by Iran. It will go for a war to defend its energy reliability and, as a result, its energy security.

Furthermore, Israel is applying a liberalism policy that crosses its energy interest with security issues, reflecting on making positive peace, capitalizing interests, transborder transactions, establishing regional organizations, and depoliticization policies. The EastMed project was an excellent example of liberalism by consolidating its ties with the EU, Egypt, and Turkey's relations. Still, if it can reach its energy interest without peace cost, it would prefer what happened with the Palestinian. As a result, liberalism behavior assists energy reliability in Israel. **Energy reliability in energy security theory is the cornerstone of the Israeli security system.**

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الملخص

مصادر الطاقة في اسرائيل: التأثيرات على منظومة الدولة الأمنية

هذه الرسالة تبين أثر اكتشافات الغاز في إسرائيل من وجهة نظر أمنية. إن السؤال الرئيسي الذي حاولت الرسالة الإجابة عليه هو: ما هو أثر اكتشافات الطاقة ومنظومة تزويد الطاقة على أمن الدولة في إسرائيل؟ اتخذت الرسالة المنهج التاريخي والتحليلي للإجابة عن أسئلة الرسالة، أن الجزء التحليلي سيكون مبنيا على مراجعة نظريات أمن الطاقة وجيوبوليتك الطاقة، لتقدم مجتمعة الإطار النظري الذي سيساعد في عرض النتائج والتحليلات النهائية بالإضافة الى الاعتماد على تحليلات النظرية الليبرالية لفهم سلوك اسرائيل.

إن إسرائيل تغير علاقاتها مع تركيا بأخرى مع اليونان وجمهورية قبرص من أجل تنفيذ المشروع المشترك لأنبوب غاز شرق المتوسط، والذي سينقل الغاز الإسرائيلي الى سوق الاتحاد الأوروبي، حيث يشجع الاتحاد الأوربي المشروع لتلبية سياسة تنويع مصادر الطاقة لديه. لكن المشروع يواجه أنشطة معارضة، خصوصا من تركيا، بناء على الحدود البحرية المتنازع عليها بين تركيا واليونان وجمهورية قبرص. كما ان المشروع يهدد مكانة تركيا كممر للطاقة الى أوروبا وإسرائيل. في هذا السياق فإن إسرائيل تحافظ على تدفق الطاقة من خلال تركيا بعدم تسيّس العلاقات الاقتصادية معها. بالإضافة الى ان روسيا قد تعارض المشروع تحت مظلة تواجدها في سوريا، لكنها تعارضه اقتصاديا لأنه قد يقلل من حصتها في السوق الأوروبي.

من جهة أخرى، فإن إسرائيل مهتمة بالسلام الإيجابي كما هو في علاقتها مع مصر والأردن، وهم المستهلكون الرئيسيون للغاز الإسرائيلي. كما ان إسرائيل تتوسع في شبكة الطاقة الإقليمية وكذلك استخدام البنية التحتية المصرية لتصدير الغاز المسال، مما يساعد على تخطي آثار تأخر تنفيذ أنبوب غاز شرق المتوسط. في المقابل، فإن مصر من الممكن ان تهدد قطاع الطاقة في إسرائيل كما فعلت سابقا بعد الثورة المصرية 2011 او التحكم بمرور الطاقة من خلال مضائق تيران. لذلك، فإن مشروع أنبوب غاز شرق المتوسط مهم لمستقبل الطاقة في إسرائيل كبديل عن الخيار المصري. في الجانب الفلسطيني، فإن إسرائيل تستخدم الطاقة كأداة تحكم وعلى النقيض فهي تعتبر الفلسطينيين كجزء من المستهلكين المضمونين لسوق الطاقة الاسرائيلي. كما أنها تستفيد من تأخر تطوير حقول الغاز الفلسطيني وحالة اللاسلام الحالية.

إن التهديدات الرئيسة لقطاع الطاقة في إسرائيل لن تكون من قبل المجموعات المسلحة كحماس أو حزب الله بل ستكون من تهديدات تقليدية لدول معادية كإيران. أن إيران بإمكانها وقف مسار تزويد الطاقة لإسرائيل من خلال البحر الأحمر او مضائق تيران، وهو ما لا تستطيع فعله المجموعات المسلحة. أن التهديدات التقليدية، عكس المجموعات المسلحة، تؤثر بشكل مباشر في موثوقية الطاقة والتي تعتبر ركنا أساسيا لتحقيق أمن الطاقة في إسرائيل والتي لن تسمح إسرائيل بخرقه حتى لو أدى لحروب مستقبلية. لكن إسرائيل غير مفضلة لخيار الحرب الذي قد يضر بتشجيع الاستثمارات العالمية في قطاع الطاقة لديها.

إن هذه التهديدات حفزت إسرائيل لزيادة تسليح قواتها البحرية معتمدة على عائدات الغاز المحلي، إن هذه السياسة التسليحية جاءت لتغطية النقص التقليدي بالاهتمام بالقوات البحرية الإسرائيلية. كما إن عوائد الغاز الاقتصادية وفرت أسعار طاقة مناسبة في إسرائيل مما يزيد القوة التصنيعية المحلية وكذلك التنافسية للتصدير. إن وفرة مصادر الطاقة المحلية قد تشجع إسرائيل لممارسة شكل حرب طويلة بدلا من الحروب الخاطفة السريعة، الذي طبقته سابقا لشح الموارد الاقتصادية ومنها مصادر الطاقة. في النهاية، إن الولايات المتحدة الأمريكية قد تتدخل لدعم إسرائيل في ظل التهديدات لقطاع الطاقة، وهو كما قامت به سابقا في خلال الحرب العراقية الإيرانية في الثمانينات من القرن العشرين لحماة تدفق الطاقة. كما ان أمريكا تعزز علاقاتها مع جمهورية قبرص بعد قرار الكونغرس للعام 2019 بالإضافة الى تعزيز إسرائيل لعلاقتها العسكرية مع الجمهورية القبرصية.