THE EVALUATION OF THE RELATIONSHIP AMONG THE ENERGY IMPORT, CURRENT ACCOUNT DEFICIT AND THE ECONOMIC GROWTH OF TURKEY WITHIN THE SCOPE OF THE EASTERN MEDITERRANEAN POLICY OF TURKEY AND THE GLOBAL COMPETITION IN EASTERN MEDITERRANEAN

MASTER'S THESIS

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MASTER'S THESIS

Department of Economics (English)

Supervisor: Prof. Dr. Erkan ÖZATA

Eskişehir

Anadolu University

Graduate School of Social Sciences

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ÖZET

TÜRKİYE'DE ENERJİ İTHALATI, CARİ AÇIK VE BÜYÜME İLİŞKİSİNİN TÜRKİYE'NİN DOĞU AKDENİZ POLİTİKASI VE DOĞU AKDENİZ'DE KÜRESEL REKABET KAPSAMINDA DEĞERLENDİRİLMESİ

Halil İbrahim DOĞAN

İktisat Anabilim Dalı

Anadolu Üniversitesi, Sosyal Bilimler Enstitüsü, Mayıs 2021

Danışman: Prof. Dr. Erkan ÖZATA

Enerjide yüksek oranda dışa bağımlılık ekonomik büyüme, cari açık ve enerji ithalatını kısır bir döngüye sokmaktadır. Bu bağlamda Doğu Akdeniz'de keşfedilmesi muhtemel olan enerji rezervleri Türkiye için bir fırsat yaratmaktadır. Bu çalışma enerji ithalatı, ekonomik büyüme ve cari işlemler dengesi arasındaki nedensellik ilişkisini inceleyerek bu ilişkiyi Türkiye'nin Doğu Akdeniz Politikası ve Doğu Akdeniz'de Küresel Rekabet kapsamında değerlendirmeyi amaçlamaktadır. Bu amaçla Türkiye'nin 1999-2020 yılları arası çeyreklik verileri kullanılarak Vektör Otoregresif Model (VAR) kurulmuş ve bu model üzerinden Granger Nedensellik Testi, Etki Tepki Fonksiyonu ve Varyans Ayrıştırması analizleri yapılmıştır. Yapılan analizler sonucunda enerji ithalatından ve ekonomik büyümeden cari işlemler dengesine doğru tek yönlü bir nedensellik bulunmuştur. Aynı zamanda cari açıkta meydana gelen bir değişimin %9,13'ünün ve ekonomik büyümede meydana gelen bir değişimin %18,88'inin enerji ithalatı tarafından açıklandığı tespit edilmiştir.

Bu veriler ışığında enerji ithalatına harcanan yüksek miktardaki dövizin ülkede kalması ve bu paranın ülke içi yatırımlara ve AR-GE çalışmalarına yönlendirilmesi adına Doğu Akdeniz'de keşfedilecek enerji kaynakları Türkiye'nin sağlıklı bir büyüme modeline sahip olması demektir. Aynı zamanda enerji yoğun sektörlerdeki maliyet avantajının fiyatlara yansıması ve yurt içi enerji üretimi sayesinde fiyatların kur etkisinden ve dünyadaki gelişmelerden daha az etkilenmesi de muhtemeldir.

Anahtar Sözcükler: Doğu Akdeniz, Küresel rekabet, Enerji politikası, Enerji ithalatı, Cari açık, Ekonomik büyüme, Vektör otoregresif model (VAR).

ABSTRACT

THE EVALUATION OF THE RELATIONSHIP AMONG THE ENERGY IMPORT, CURRENT ACCOUNT DEFICIT AND THE ECONOMIC GROWTH OF TURKEY WITHIN THE SCOPE OF THE EASTERN MEDITERRANEAN POLICY OF TURKEY AND THE GLOBAL COMPETITION IN EASTERN MEDITERRANEAN

Halil İbrahim DOĞAN

Department of Economics

Anadolu University, Graduate School of Social Sciences, May 2021

Supervisor: Prof. Dr. Erkan ÖZATA

High foreign dependency in energy puts economic growth, current account deficit and energy imports into a vicious circle. In this context, the energy reserves that are likely to be discovered in the Eastern Mediterranean create an opportunity for Turkey. This study aims to evaluate the causality relationship between energy imports, economic growth and current account balance within the scope of Turkey's Eastern Mediterranean Policy and Global Competition in the Eastern Mediterranean. For this purpose, a Vector Autoregressive Model (VAR) was established by using the quarterly data of Turkey between 1999 and 2020, and Granger Causality Test, Impulse Response Function and Variance Decomposition analyzes were performed on this model. As a result of the analysis, a one-way causality was found from the energy imports and economic growth to current account balance. At the same time, it was determined that 9.13% of a change in the current account deficit and 18.88% of a change in economic growth was explained by the energy imports. In the light of these data, energy resources to be discovered in the Eastern Mediterranean mean that Turkey will have a healthy growth model in terms of keeping the high amount of foreign currency spent on energy imports in the country and directing this money to domestic investments and R&D studies. It is also possible that the cost advantage in energy-intensive sectors will be reflected in prices and, thanks to domestic energy generation, prices will be less affected by the exchange rate effect and developments in the world.

Keywords: Eastern Mediterranean, Global competition, Energy policy, Energy imports, Current account deficit, Economic growth, Vector autoregressive model (VAR).

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10/05/2021

STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND RULES

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with "scientific plagiarism detection program" used by Anadolu University, and that "it does not have any plagiarism" whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

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LIST OF SYMBOLS AND ABBREVIATIONS

ADF	: Augmented Dickey Fuller
AIC	: Akaike information criterion
BOT	: Build-Operate-Transfer
BOTAŞ	: General Directorate of Pipelines and Petrol Transportation Inc.
CAB	: Current account balance rate of change
DF	: Dickey Fuller
DPT	: State Planning Organization
EEZ	: Exclusive economic zone
EIEI	: Electricity Works Study Administration
EIM	: Rate of change of energy imports
EP	: European Parliament
EPDK	: Energy Market Regulatory Authority
EU	: European Union
EÜAŞ	: General Directorate of Elektrik Üretim AŞ
EVDS	: Central Bank Electronic Data Distribution System
FPE	: Akaike's Final Prediction Error
FSRU	: Floating Storage and Regasification Unit
GASC	: Greek Administration of Southern Cyprus
GDP	: Gross domestic product
GDPGR	: GDP growth rate
GWh	: Gigawatt hours
HEPPs	: Hydroelectric Power Plants
HQ	: Hannan-Quin Information Criterion
ICJ	: International Court of Justice
IEA	: International Energy Agency
INOGATE	: Interstate Oil and Gas Transport to Europe Program
IRF	: Impulse Response Function
JTF	: Just Transition Fund
JTM	: Just Transition Mechanism
KWh	: Kilowatt hour
LR	: Likelihood Ratio

MAPEG	: General Directorate of Mining and Petroleum Affairs
MENR	: Ministry of Energy and Natural Resources
MTA	: General Directorate of Mineral Research and Exploration
MTEP	: Million-Ton Equivalent of Petroleum
MW	: Megawatt
NATO	: The North Atlantic Treaty Organization
NAVTEX	: NAVigational TEleX
NDK	: Nuclear Regulatory Authority
NPP	: Nuclear Power Plant
OECD	: Organization for Economic Co-operation and Development
OPEC	: The Organization of Petroleum Exporting Countries
R&D	: Research and development
SC	: Schwarz Information Criterion
TANAP	: Trans-Anatolian Natural Gas Pipeline
TEAS	: Turkey Electricity Generation-Transmission Corporation
TEDAŞ	: Turkey Electricity Distribution Company
TEIAS	: Turkey General Directorate of Electricity Transmission
TEK	: Turkey Electricity Authority
TEMSAN	: Electromechanical Industry Inc. General Directorate of Turkey
TEN-E	: Trans-European Energy Infrastructure
TENMAK	: Turkey Energy, Nuclear and Mining Research Institute
TEP	: Ton Equivalent petroleum
TKI	: Turkey Directorate General of Coal Enterprises
TOE	: Tonne(s) of oil equivalent
TPAO	: Turkish Petroleum Corporation
TPIC	: Turkish Petroleum International Company
TRNC	: Turkish Republic of Northern Cyprus
TTK	: Turkey Hard Coal Enterprises General Directorate
TURKSTAT	: Turkish Statistical Institute
UN	: United Nations
UNCLOS	: United Nations Convention on the Law of the Sea
USA	: United States of America
USGS	: US Geological Research Center

VAR : Vector Autoregression

YEKA : Renewable Energy Resource Areas

α : Coefficient of equation

β : Coefficient of equation

δ : Coefficient of equation and constant term

Δ : Difference of the relevant variable

ε : Error term

θ : Coefficient of equation

μ : Coefficient of equation

σ : Coefficient of equation

φ : Coefficient of equation

INTRODUCTION

Energy has been one of the most fundamental resources for people to survive and raise their living standards since the beginning of human history. Energy resources, which develop and diversify in parallel with the basic and time-changing needs of people, are used in many areas in today's world as well as in past civilizations.

Today, increasing population, industrialization and widespread use of energy have significantly increased the energy demand. However, as the distribution of energy resources in the world is not balanced, some countries can meet this demand with rich energy resources, while some countries have to meet this demand with imports. In this respect, the issue of obtaining and using energy with different energy policies has always been on the agenda of countries.

For states that cannot meet the demand in the country in terms of energy resources, energy imports have a large share in the economies of these countries. Along with the industrialization and growing population, Turkey like many developing countries has taken its place among energy importers to meet the significant increase in energy demand and in order to keep high welfare. According to 2019 data from Turkstat, Turkey's total imports in 2019 was about 210 billion dollars while energy imports was amounted 41 billion dollars. It is clear that high energy imports which are directly affecting the foreign trade deficit make Turkey dependent on foreign energy.

On the other hand, energy search and exploration work continue in many different parts of the world. Natural gas, petroleum, and hydrocarbon reserves that are discovered in the Eastern Mediterranean, which have come to the fore in recent years, whet the appetite of coastal countries and energy companies that want to dominate that region. Turkey, which has the longest coast in the Eastern Mediterranean, increasing its energy exploration and drilling initiatives in the region every year. This situation has also brought the issue of the Islands and Cyprus on the agenda has increased the importance of the policies in the region and has become the main agenda item of the foreign policies of the countries. The legal dimension of the problem, exclusive economic zone discussions, and the Cyprus issue will be evaluated in detail in the following parts of the study. The important point here is the issue of the foreign energy dependence of Turkey that is likely to be solved depending on the success achieved in exploration and drilling activities Turkey has made in its Exclusive Economic Zone.

When we look at Turkey's foreign trade structure, it is noteworthy that forms an important part of energy imports as approximately 20% of total imports. This situation is also one of the important determinants of the current account deficit. The current account, which is considered as a summary of the economic relations of a country with other countries and is one of the important elements of the balance of payments, is an indicator of the country's income and expenditure. Current account deficit, on the other hand, is a negative current account situation that occurs when a country consumes more than it produces. The current account deficit in Turkey, which is the subject of many studies, often to conclude that create a crisis if it exceeds a certain threshold value of the deficit. The main reason for the emergence of these assumptions, Turkey has experienced crises in 1994 and 2001 and that it has reached the level of current account deficit to GDP ratio of 4%-3,5%.[1] Therefore, the current account balance is an important indicator that should be followed for economies. Demir found in his study that he conducted in 2013 that the increase in the production increases the energy demand and consequently the increase in the energy demand increases the energy imports and consequently the current account deficit. In this context, energy supply is of great importance for Turkey as economic growth requires production and production necessitates energy needs.

The aim of the study is to evaluate Turkey's Eastern Mediterranean Policy and Global Competition in the Eastern Mediterranean in line with the econometric analysis and findings, and to discuss the possible reflections of the equation in the region on the Turkish economy. In this context, first of all, the concept of energy, its resources and policies were discussed in general and the importance of energy was revealed. It is aimed to provide a different perspective to energy policies by considering the energy policies of the European Union, in which Turkey has close political and economic relations. Then, in the historical process, it was aimed to evaluate the current policies in historical terms by examining Turkey's energy policies. In the continuation of the study, the concept of the exclusive economic zone has been explained in general by considering the Eastern Mediterranean issue. Information was given about the claims made in the exclusive economic zone discussions and the cases that were previously subject to international law on this subject. Afterwards, the rights of Turkey arising from international maritime law were examined. Subsequently, information was given about the energy resources and

[1]E. Erbaykal (2007). *Türkiye'de Ekonomik Büyüme ve Döviz Kuru Cari Açık Üzerinde Etkili Midir? Bir Nedensellik Analizi.* ZKÜ Sosyal Bilimler Dergisi, 3(6), s. 82.

energy fields discovered in the region. It was thought that examining the strategies of the coastal countries in the region would be beneficial for understanding the Eastern Mediterranean policy of Turkey better, and in this context, the policies and strategies of 9 countries including Turkey and the GASC were discussed. Afterwards, the policies and strategies of the global powers included in the energy equation in the region were discussed and global competition in the Eastern Mediterranean was tried to be revealed. Finally, the possible implications of possible energy discoveries in the Eastern Mediterranean on the Turkish economy are evaluated.

When the theoretical and empirical literature is examined, it is understood that energy import, economic growth and current account balance are interrelated. However, the relationship of these variables with each other was generally examined in the form of bilateral relations. The number of studies examining all three variables together is very few. The contribution of this study to the literature: the relations of energy import, economic growth and current account balance with each other will be analyzed with econometric analysis methods and evaluated within the scope of Turkey's Eastern Mediterranean Policy and Global Competition in the Eastern Mediterranean.

CHAPTER ONE

1. ENERGY CONCEPT, RESOURCES AND POLICIES

In this part of the study, the concept of energy is discussed in general and information about energy is given. In continuation, it has been tried to expose Turkey's energy profile by giving information about energy sources and energy policies in the world and Turkey.

1.1. Definition and Types of Energy

The word energy comes from the word energeia, which means "activity, operation" in ancient Greek.[2] Today, energy is generally defined as the ability to do a job. The reason modern civilizations exist is that humans have been able to transform energy into different forms and use it to do job. People use energy for many different purposes, from walking to cycling, from heating and lighting to cooking, moving cars and ships, to sending astronauts into space.[3]

There are various forms of energy including heat, light, motion, electrical, chemical and gravitational. It is also possible to divide these forms into two groups as kinetic energy and potential energy. Energy can transform from one form to another. For example, the food that a person eats contains chemical energy and this energy is stored in the human body until the person converts this energy into kinetic energy during his movement. Chemical energy contained in a coal or natural gas or kinetic energy of a flowing river can be converted into electrical energy and consequently heating or lighting.[4]

1.2. Energy Sources

Resource is an economic element that provides benefits and profits when obtained and used. The amount of the resource and the monetary value of the resource that arises depending on the demand for that resource directly concerns the economy. In order for a resource to be useful, the use of that resource must be efficient and have low costs. For example, if the energy investment required for the extraction of oil reserves as an energy

[2]https://tr.wikipedia.org/wiki/Enerji (Erişim Tarihi: 15.12.2020)
[3]https://www.eia.gov/energyexplained/what-is-energy/ (Erişim Tarihi: 15.12.2020)
[4](http-1).

resource is more than the energy resource that this reserve will provide, it will not be considered as a resource.[5] In terms of energy resources, it can be divided into two main categories as renewable energy sources and non-renewable energy sources.

Renewable energy is the energy obtained from the resources found in nature and which is constantly renewed by nature. These resources can be listed as solar energy, wind energy, wave energy, geothermal energy, hydraulic energy, biomass energy. Renewable energy technologies also include hybrid and related technologies. For example: storing energy generated using renewable energy, predicting renewable energy supply, and helping deliver energy generated using renewable energy technologies to energy consumers.[6]

On the other hand, non-renewable energy, natural resources that cannot be produced at a level that can meet consumption, cannot be reused or created, are called non-renewable (unsustainable) energy. The amount of these resources on earth is fixed and consumed faster than nature can regenerate. Non-renewable energy sources are divided into two groups as core sources and fossil fuels. Major non-renewable energy sources can be listed as nuclear, oil, coal and natural gas. World reserves; 860.94 billion tons in coal, 225.4 billion tons in petroleum, 208.4 trillion m3 in natural gas. The remaining useful lives of fossil fuels; 54 years in oil, 64 years in natural gas, 112 years in coal.[7]

1.2.1. Overview of the energy resources in the world and Turkey

For most of human history, our ancestors used simple forms of energy, such as animal power, human muscle, or the burning of biomass (such as wood and crops) as energy. Biomass is the general name for all non-fossilized biological material obtained from living or recently living creatures. Biomass is an energy source and in industrial terms, biomass is related to obtaining fuel from these biological materials or using them for other industrial purposes. However, it does not contain fossilized and geographically altered organic materials such as coal and petroleum.[8]

[5]https://tr.wikipedia.org/wiki/Yenilenemeyen_enerji_kaynağı (Erişim Tarihi: 16.12.2020)
[6]https://web.archive.org/web/20160612143340/http://arena.gov.au/about-renewable-energy/ (Erişim Tarihi: 16.12.2020)
[7]https://tr.wikipedia.org/wiki/Enerji_kaynakları (Erişim Tarihi: 16.12.2020)
[8]https://tr.wikipedia.org/wiki/Biyokütle (Erişim Tarihi: 16.12.2020)

However, in the process that started with the industrial revolution, fossil fuels (coal, oil, gas) started to play an important role in the global system. Especially in the last century, fossil fuel consumption has increased 8 times since 1950 and roughly 2 times since 1980. In this increase, consumption has shifted from coal to oil and gas over time and today oil and gas constitute a significant share of fossil fuel consumption.[9]

The most fossil fuel consumption in the world is 20,000 TWh by countries such as India and Russia, especially China, USA and EU. Turkey with 1,468 TWh fossil fuel consumption, is among the relatively less energy-consuming countries. As of 2019, approximately 84% of the global primary energy resource is obtained from coal, oil and gas. One of the main factors of energy consumption is undoubtedly electricity. Because, according to 2019 data, 64% of the total electricity production in the world was met from fossil fuels. Turkey has met about 56% of the power generation from fossil fuels.[10]

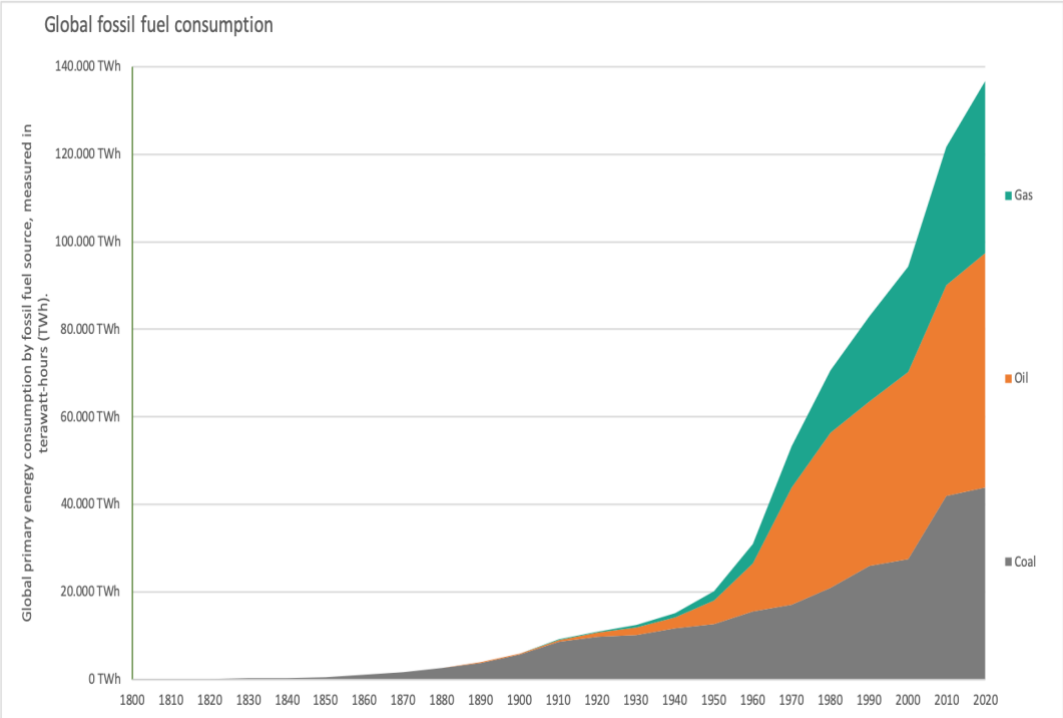

Figure 1. 1. *Fossil fuels by global consumption (TWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

1.2.1.1. *Coal*

[9]Ritchie, H., & Roser, M. (2017). *Fossil Fuels*. Our World in Data.
[10]Ritchie, H., & Roser, M., 2017, **a.g.k.**

Although coal has lost its popularity in terms of consumption from the past to the present due to the damage it causes to the environment, countries with high coal reserves continue to obtain energy from coal and therefore produce coal. According to 2019 data, China is the country with the highest amount of coal production in the world. It is possible to see a decrease in coal production in European countries, which are brought to the agenda with the reduction of carbon emissions and environmental policies. In Turkey it is not seen a significant increase or decrease in the past to the present coal production.

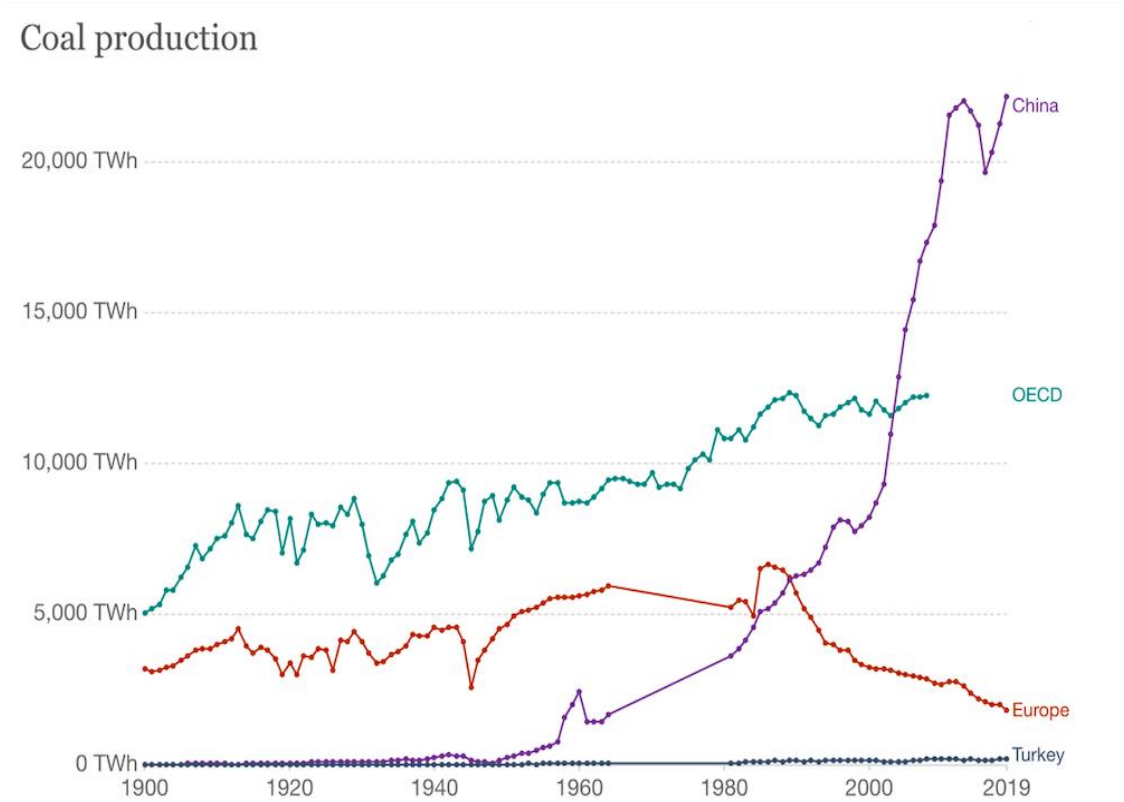

Figure 1. 2. *Coal production by countries (TWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

Considering the world in general, approximately 36% of the total electricity generation is met from coal compared to 2019. When we look at the countries that meet their electricity production from coal, India is in the top ranks with a rate of about 73%. China meets a large part of its electricity production from coal, with a ratio of approximately 65%. Unlike China and India, which are above the world average, this rate is approximately 17% in Europe. Turkey provides 37% of electricity generation from coal in a way close to the world average.

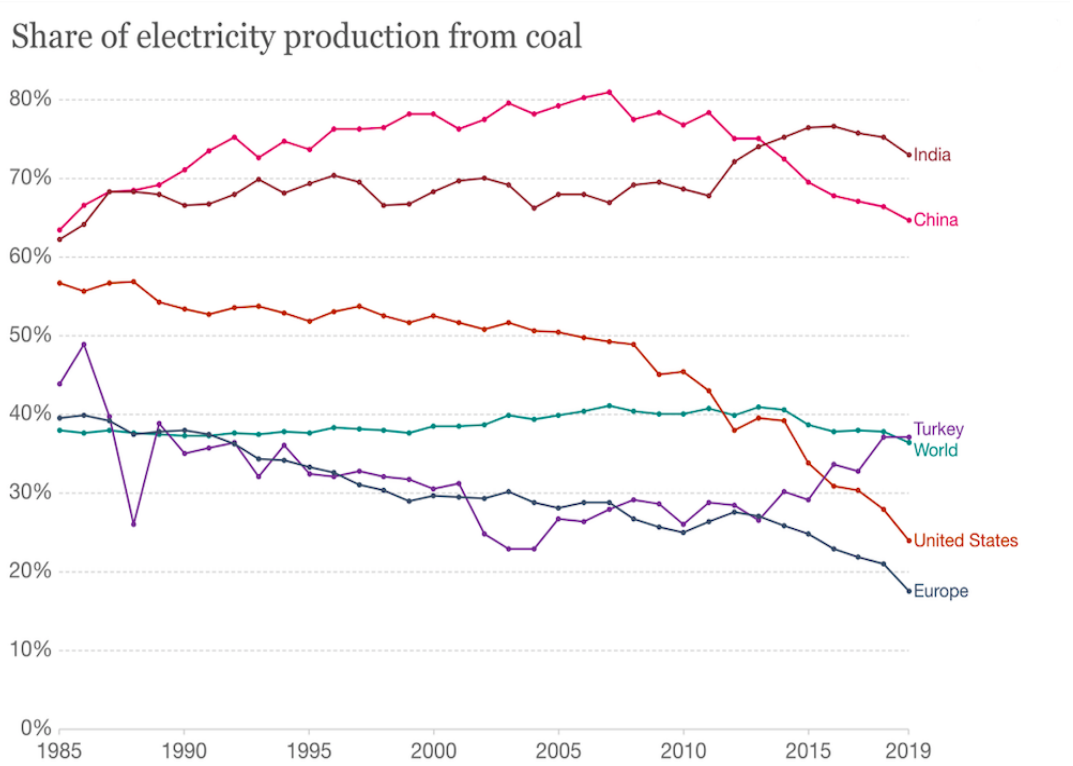

Figure 1. 3. *Share of electricity production from coal (%)*

Source: *Our World in Data. Ritchie & Roser (2019).*

1.2.1.2. *Oil*

The fossil fuel used more than coal today is oil. Crude oil and other liquids produced from fossil fuels are converted into petroleum products that humans use for various purposes. Petroleum products are generally used as vehicle fuel and are used extensively to heat buildings and generate electricity. In the industrial sector, the petrochemical industry uses oil as a raw material to produce plastics, polyurethane, solvents, and hundreds of other intermediate and finished goods.[11]

Most of the oil production in the world is carried out by the Middle Eastern countries, the USA and Russia. In addition, some oil producing countries united and established the organization called OPEC. The Organization of Petroleum Exporting Countries, or OPEC in short, is a multinational organization established by 12 countries that own a large part of the world's oil reserves, to coordinate the petroleum policies of its members and to provide technical and economic assistance to member countries.[12]

[11]https://www.eia.gov/energyexplained/oil-and-petroleum-products/use-of-oil.php (Erişim Tarihi: 18.12.2020)
[12]https://tr.wikipedia.org/wiki/OPEC (Erişim Tarihi: 18.12.2020)

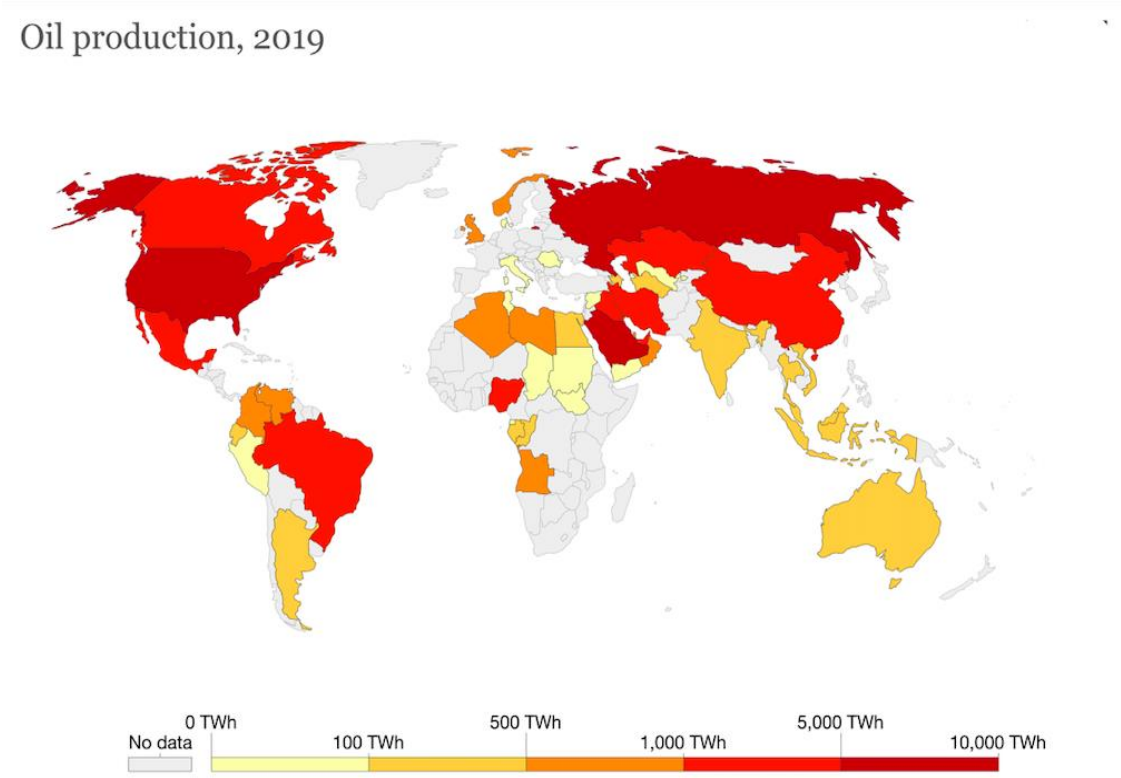

Figure 1. 4. *Oil production by countries (TWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

Oil production data is an important indicator to be followed, showing where the oil is extracted from, which countries are involved in production, and how oil reserves are distributed around the world. However, the consumption dimension of oil is also an important indicator reflecting the energy needs of countries.

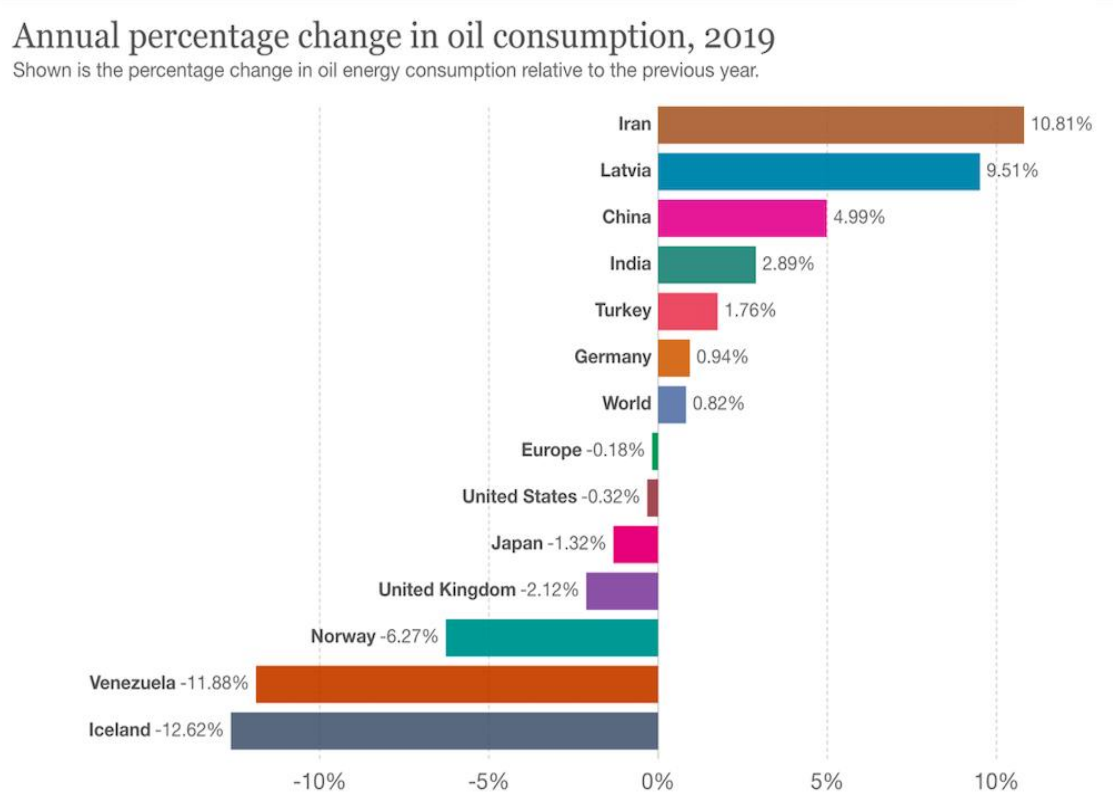

Figure 1. 5. *Annual percentage change in oil consumption (%)*

Source: *Our World in Data. Ritchie & Roser (2019).*

Looking at the table, it shows how much the oil consumption of countries has changed in percentage compared to the previous year. While the world consumed 0.82% more oil in 2019 compared to 2018, there was 0.18% more consumption in Europe. Iran is the country that increased its oil consumption the most with 10.81% in 2019 compared to 2018. On the other hand, Iceland reduced its oil consumption by 12.62% in 2019. Turkey's oil consumption in 2019 compared to the previous year increased 1.76%.

1.2.1.3. *Natural gas*

Millions of years ago and over a long period of time, plant and animal remains (such as diatoms) mixed with sand, alluvium and calcium carbonate formed on the surface of the earth and the ocean floors, forming thick layers. Over time, these layers were buried under sand, silt and rock. Pressure and heat have turned some of these carbon and hydrogen-rich materials into coal, some into oil and some into natural gas. Natural gas is a fossil energy source formed in the depths of the earth. Natural gas contains many different compounds. The largest component of natural gas is methane, a compound with

one carbon atom and four hydrogen atoms (CH4). Natural gas also contains smaller amounts of natural gas liquids (NGL are also hydrocarbon gas liquids) and non-hydrocarbon gases such as carbon dioxide and water vapor. Natural gas is used as fuel, as well as in the production of materials and chemicals.[13]

According to 2018 data, it is estimated that the total discovered gas reserve in the world is 197.08 trillion m³. Natural gas is produced in various parts of the world, but only a few are natural gas exporters. The country with the most reserves is Russia with 38.04 trillion m³.[14] On the other hand, when we look at the natural gas export data of the countries, as of 2019, Russia, the world's largest natural gas exporter, exports approximately twice as much natural gas as Qatar, which is its closest follower.

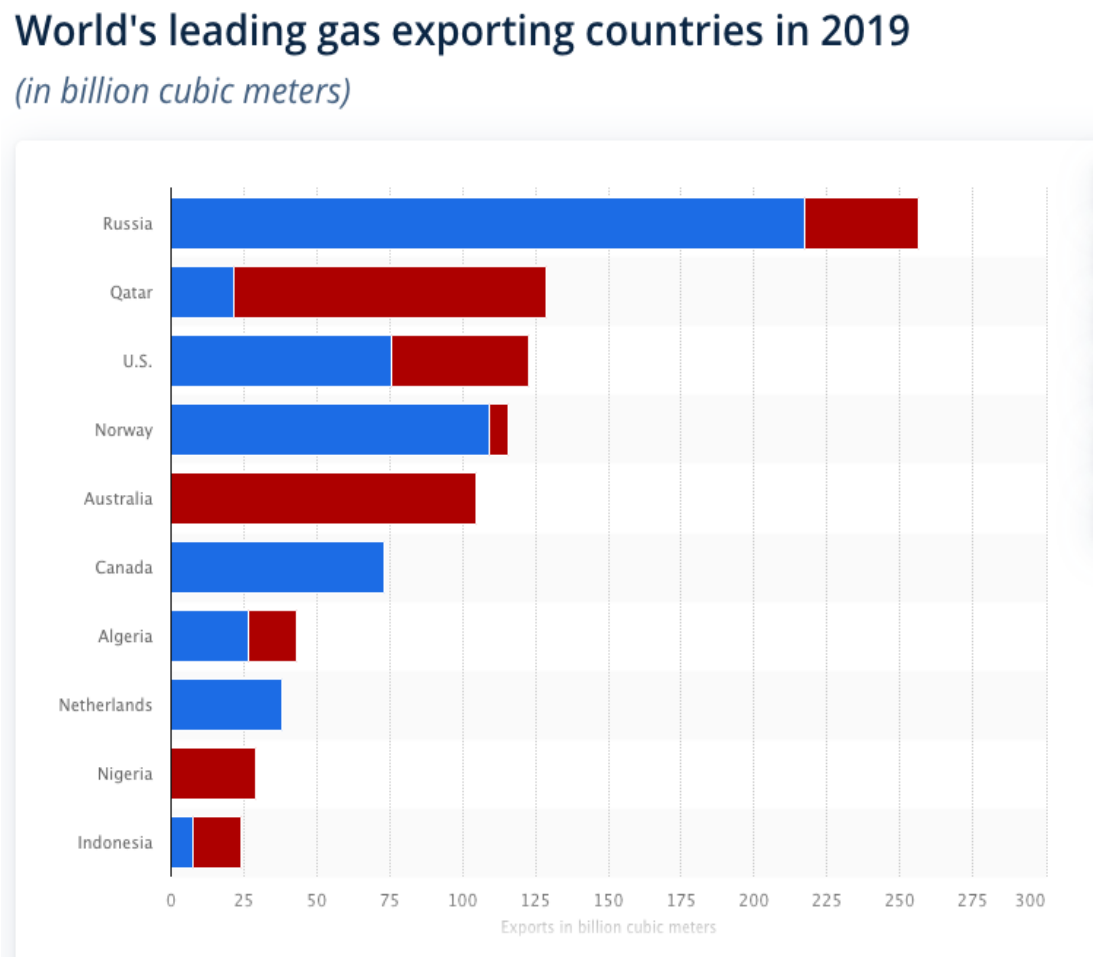

Figure 1. 6. *World's Leading Gas Exporters*

Source: *Energy Facts: World's Leading Gas Exporters 2019 (Statista*, 2020)

[13]https://www.eia.gov/energyexplained/natural-gas/ (Erişim Tarihi: 19.12.2020)
[14]Ritchie and Roser, 2017, **a.g.k.**

When evaluating natural gas consumption, when we examine the natural gas consumption data of countries per capita, an average of 5,094 kWh of natural gas is consumed per person in the world. Countries with high reserves but relatively low populations and countries with very high populations are not included in the chart.

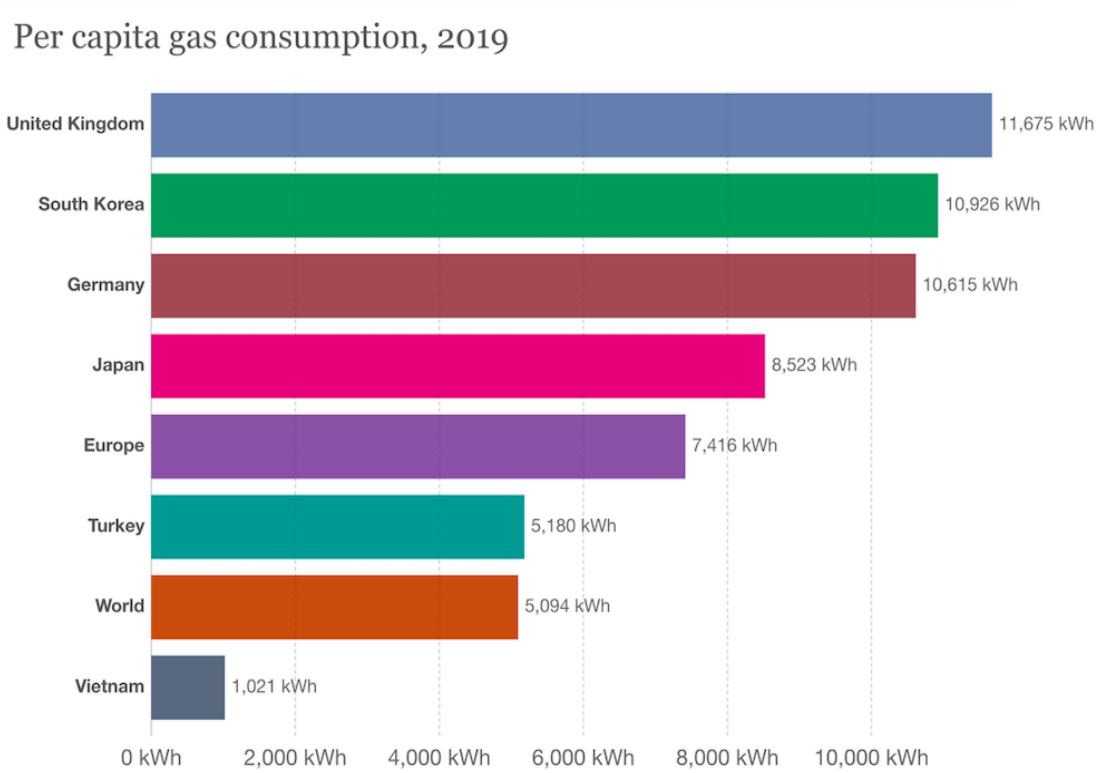

Figure 1. 7. *Per capita gas consumption (kWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

Natural gas is the second largest source of electricity generation. The share of natural gas in electricity generation has increased as coal, one of the energy used in electricity generation, has been replaced by natural gas in many countries. One of the biggest reasons for this is that climatic and environmental policies come to the fore because the carbon dioxide emission of natural gas is less than that of coal. However, within the framework of these policies, the long-term plans of the countries are generally in favor of renewable energy and nuclear energy with even less carbon dioxide emissions.

1.2.1.4. *Nuclear energy*

Nuclear energy is the fragmentation of the atomic nucleus (usually uranium) by fission and the conversion of the energy it releases into usable energy in nuclear power plants.[15]

The world is trying to transform its energy systems from fossil fuels to low-carbon energy sources. In this context, there are a number of energy options when looking at low carbon energy sources. In addition to renewable energy technologies such as hydroelectric, wind and solar energy, nuclear energy is one of them. Nuclear power and renewable technologies typically emit very little CO2 per unit of energy production. It is also much better than fossil fuels in limiting local air pollution levels. However, some countries make large investments to increase the nuclear energy supply, while others are deactivating their existing power plants. Therefore, the role played by nuclear energy in the energy system varies from country to country.[16]

Nuclear energy production dates back to the 1960s, but there was a serious increase in nuclear energy production globally in 1970 and after. As seen in the table, production slowed down globally in the early 2000s. By 2011, there was a sharp decline in nuclear power generation. The most important reason for this is the Fukushima Nuclear Power Plant accident in 2011. Increasing security concerns around the world with this accident caused some countries to disable their power plants.

[15]https://en.wikipedia.org/wiki/Nuclear_power#Economics (Erişim Tarihi: 20.12.2020)
[16]https://ourworldindata.org/nuclear-energy (Erişim Tarihi: 20.12.2020)

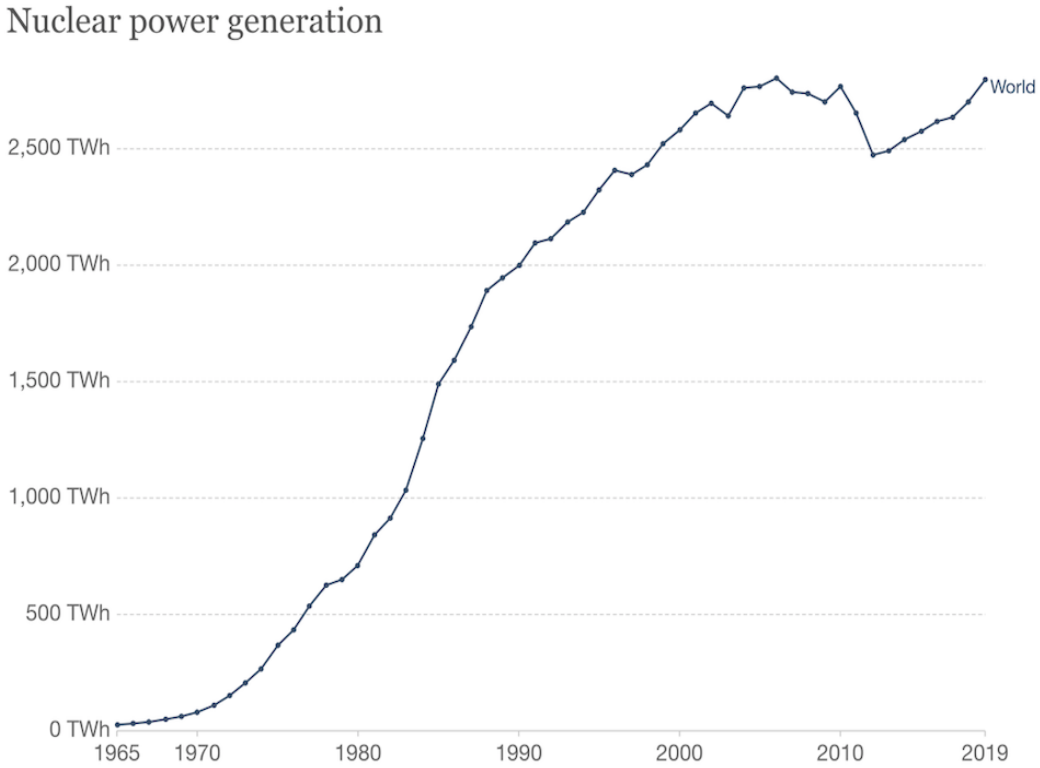

Figure 1. 8. *Nuclear power generation by world (TWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

Considering the distribution of nuclear energy production in the world, some countries produce high amounts, while some countries do not produce nuclear energy at all. The USA, France, China, Russia and Canada are the leading countries producing high nuclear energy. It is possible to see the distribution of nuclear energy production in the world on the map below.

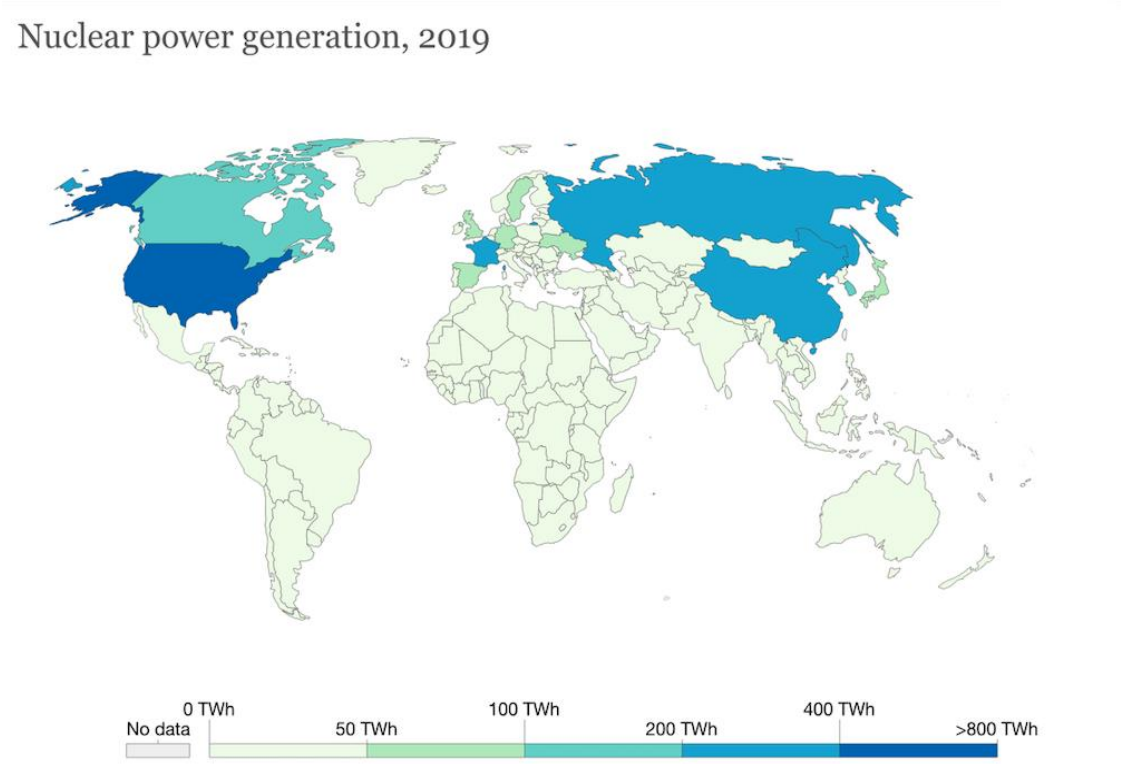

Figure 1. 9. *Nuclear power generation by countries (TWh)*

Source: *Our World in Data. Ritchie & Roser (2019).*

About 10% of electricity generation globally is provided by nuclear energy. Some countries with more than 10% share of electricity generation from nuclear energy are given in the table. France, which provides approximately 70% of its electricity production from nuclear energy, stands out in this regard. Another country where nuclear energy has a large share in electricity generation with a ratio of approximately 53% is seen in the table as Ukraine.

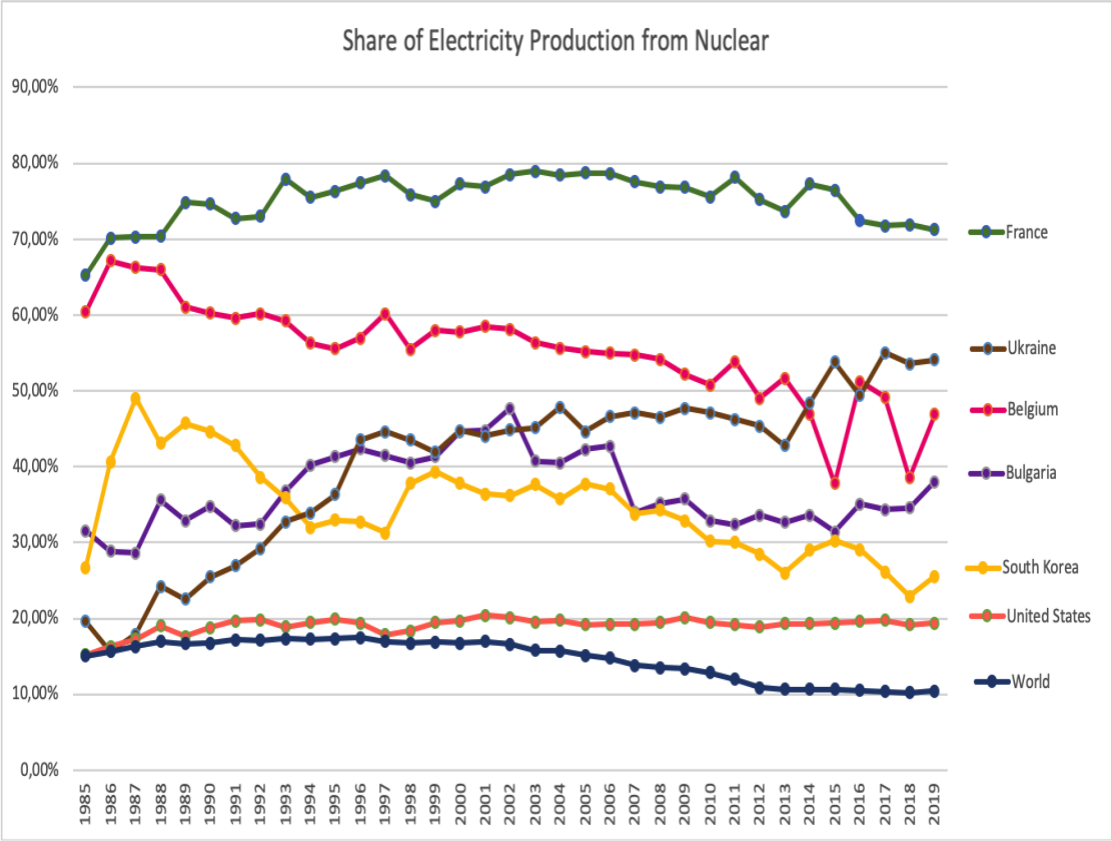

Figure 1. 10. *Share of electricity production from nuclear by countries (%)*

Source: *Our World in Data. Ritchie & Roser (2019).*

As can be seen from the above tables, nuclear energy plays an important and large role in the global energy system. However, nuclear power plants have not become widespread enough in the world due to the high installation costs and safety concerns that arose due to nuclear power plant accidents in the past. However, compared to other energy sources, the deaths caused by nuclear energy are less than other energy sources. In addition, considering the damage caused by energy sources to the environment with carbon emissions, it is possible to say that other energy sources cause much more air pollution than nuclear energy.

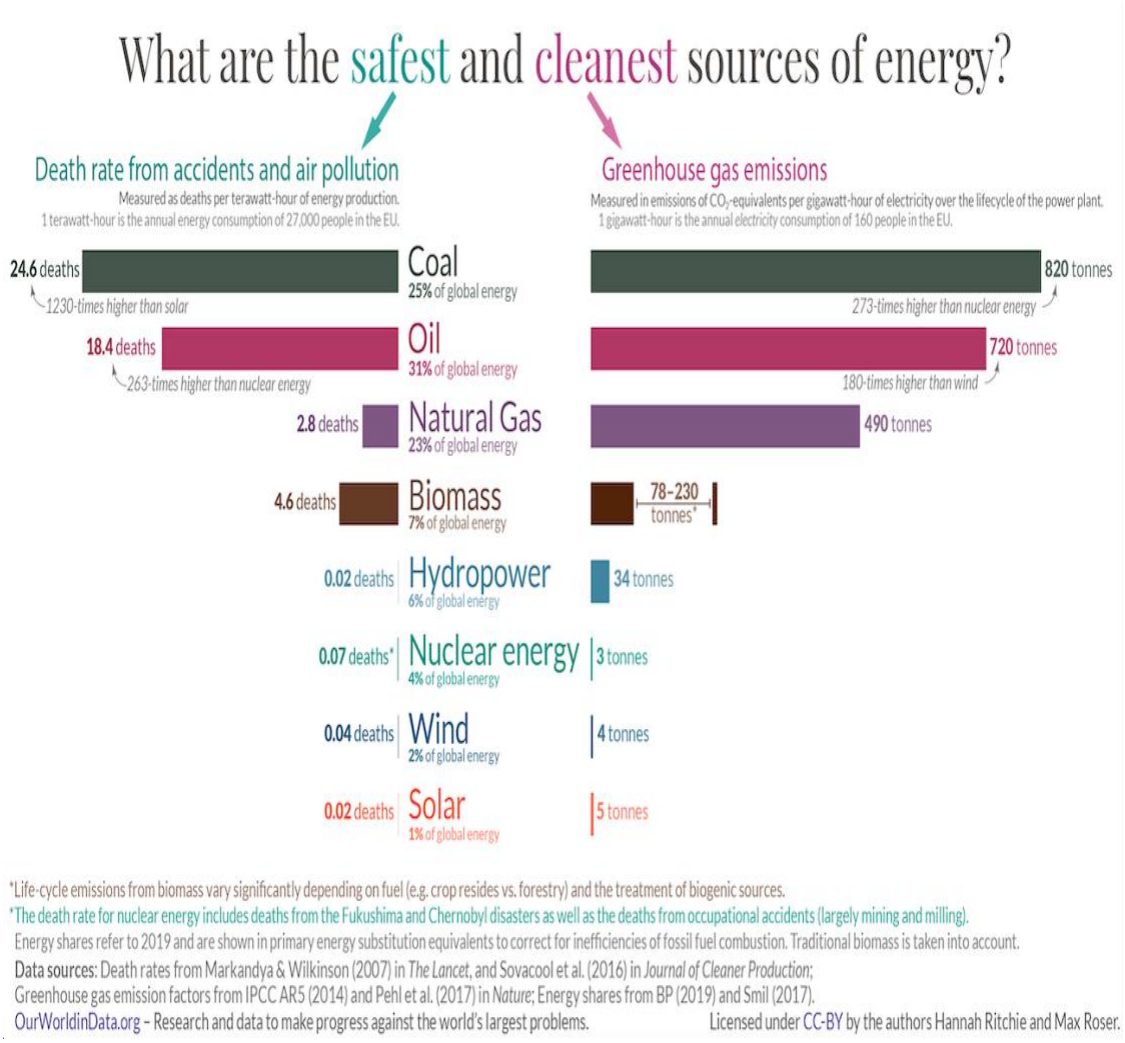

Figure 1. 11. *What are the safest and cleanest sources of energy?*

Source: *Our World in Data. Ritchie & Roser (2019).*

Today, with the effect of globalization, the usage areas of energy have become widespread and the need for energy has increased continuously. In addition to the increase in energy use in production activities, there is an increase in per capita energy consumption in daily life. When the sector-based final energy consumption is examined worldwide, transportation and industry have the highest share, while the final consumption of residents follows these two sectors.[17]

[17]https://www.iea.org/data-and-statistics?country=WORLD&fuel=Energy consumption&indicator=TFCShareBySector (Erişim Tarihi: 22.12.2020)

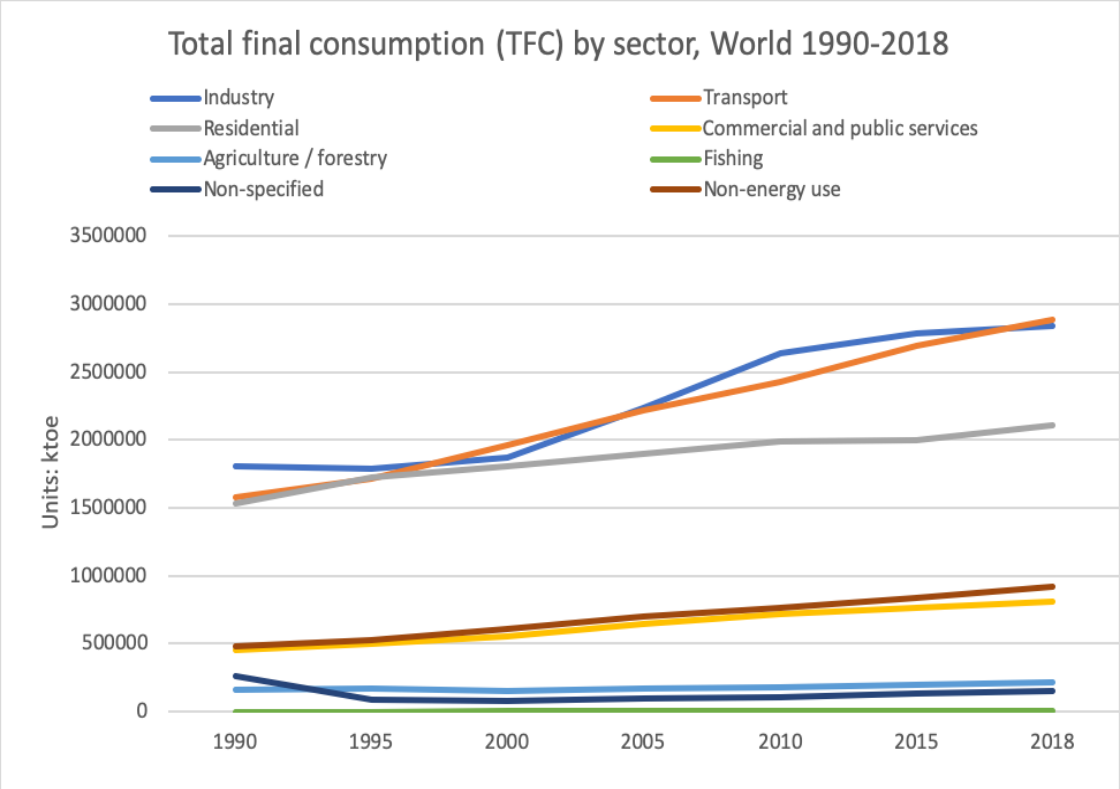

Figure 1. 12. *Total final consumption (TFC) by sector (ktoe)*

Source: *IEA World Energy Balances 2020*

1.3. Energy Policies

Today, the increasing population, industrialization and widespread use of energy have significantly increased the energy demand. However, as the distribution of energy resources in the world is not balanced, some countries can meet this demand with rich energy resources, while some countries have to meet this demand with imports. Energy, which has been subject to trade between countries from the past to the present, has gradually increased its importance in the policies of the countries. In this respect, the issue of obtaining and using energy with different energy policies has always been on the agenda of countries.

Before explaining energy policies, it is necessary to consider the concept of politics. Although the concepts of politics and policy are intertwined today, they are not always the same. When evaluated in terms of our subject, policy is a set of methods to make and implement decisions in accordance with the current situation and the future within the framework of certain data.

European Union energy policy should be examined in order to better understand Turkey's energy policy, where there are close relations of Turkey's energy trade. In the continuation of the study, after discussing the energy policies of the European Union historically, past and present energy policies implemented in Turkey will be discussed.

1.3.1. European Union energy policies in the historical process

Considering the European Union as a whole, it is largely foreign-dependent in energy. When the European energy data are examined, the European Union, which needs the most oil and petroleum products in 2018, met 94.6% of this need through imports. 83.2% of natural gas, another energy requirement of the Union, was met by imports. European energy import dependency, which was 50.1% in 1990, was 58.2% as of 2018 data.[18] Increasing dependence on energy imports poses a risk to the European Union. When evaluated in terms of energy supply security, the high energy import dependency increases the importance of energy policies for the union.

The aim of the union is to create a competitive energy market, as well as to ensure energy supply security and to create environmental policies within the scope of sustainable development plans. In this context, the basis of EU energy policies is that individuals receive cheap, quality, safe and uninterrupted service in terms of human health and environment. In addition, developing new energy systems and complementing the domestic market form the basis of the policies.[19] On the other hand, it is aimed to protect the share of coal, increase the share of natural gas, prepare a safe ground for nuclear power plants and increase the share of renewable energy sources in the energy structure among the objectives of the union.[20]

In this part of the study, the binding elements that form the road map of the Union, such as the energy policies, agreements and directives of the European Union, have been examined from the past to the present. In this context, the policies starting from 1951 until today have been divided into 4 periods. General information about European energy

[18]https://ec.europa.eu/eurostat/statistics-explained/index.php/Energy_statistics_-_an_overview#Energy_dependency (Erişim Tarihi: 06.01.2021).

[19]H. Bayraç ve M. Çildir (2017). *AB yenilenebilir enerji politikalarinine ekonomik büyüme üzerindeki etkisi.* Uluslararası Yönetim İktisat ve İşletme Dergisi, 13(13), 204.

[20]S. Aytüre (2013). *Avrupa Birliğinin enerji politikasinda son gelişmeler ve Türkiye'ye yansımaları*. In Nevşehir Hacı Bektaş Veli University Journal of Social Sciences (Vol. 3), 36-37.

policies has been given in order to look at from the perspective of the European Union and to compare with Turkey's energy policy.

1.3.1.1. *1951-1990 period*

The energy policies of the European Union are based on the European Coal and Steel Community (ECSC) established in 1951 with the Paris Agreement. This treaty also constitutes the basis of the union. With the agreement, it is aimed to create a common market in order to increase social welfare in coal and steel consumption and production. Later, with the Treaty of Rome signed in 1957, the European Atomic Energy Community (EEA) was established and the steps to establish a union in energy policies continued. With these agreements, it is aimed to regulate energy markets and to make them free and integrated. However, with the 1973 oil crisis, new policies were needed and the "New Energy Policy Strategy" was put on the agenda in the council that convened in 1974. Within the scope of this new program, it was aimed to control consumption, minimize the damage to the environment and ensure energy supply security. The second oil crisis of 1979, which broke out later, forced the council to take new measures. In this direction, a 10-year road map was drawn in 1980 and the targets to be achieved in 1990 were determined. The program, planned with this new road map, aimed for member countries to save on consumption and imports, and to increase domestic production. In these years, competition in the domestic markets of the countries has increased and inter-country integration efforts have been observed. In addition, environmental policies have not been ignored and it is aimed to improve the system by taking into account the environmental damage in the energy system. This program has been carried out successfully and by 1990, import dependency in energy decreased by approximately 10%.[21]

Another important development between these dates was the acceptance of the International Energy Program on November 18, 1974 and the approval of the International Energy Agency agreement in the same year. Although the purpose of its establishment is to take measures against possible oil shocks and to ensure cooperation

[21]A. Yorkan. (2009). *Avrupa Birliği'nin enerji politikasi ve Türkiye'ye etkileri.* Bilge Strateji, 1(1), Güz 2009, s. 26.

between member countries, today IEA, which consists of 28 members, directs energy policies with energy security, economic development and environmental policies.[22]

1.3.1.2. *1990-2004 period*

In the process that started with the dissolution of the Soviet Union in 1991, the concerns of the European Union about energy supply security increased and these developments gave direction to the policies of the union. The Energy Charter agreement, which came to the agenda in this period, was signed on December 17, 1994. When the agreement is examined in general terms, it includes issues such as energy trade, transportation, security of supply, as well as important regulations on the incentives of energy investments, new technological steps and determining the entry into the energy market by laws.[23]

Another important agreement in this period is the Interstate Oil and Gas Transport to Europe Program (INOGATE) signed between the EU and the countries on the Black Sea and the Caspian Sea and their neighbors. Developing energy cooperation and increasing efficiency in the fields of oil, natural gas, electricity and renewable energy with this cooperation are the main elements within the scope of this program. Established in 1995, INOGATE is essentially an agreement that ensures safe energy flow to the EU and aims to establish strategic alliances. Astana Energy Ministerial Conference, which will come to the agenda in the following years, is a milestone in the development of the INOGATE Program. This process, which covers the years 2004-2006, also known as the Baku Initiative, is a broader policy aimed at enhancing energy cooperation between these countries and has been adopted by all countries involved in the program.[24]

The European Union published a book in 1995 in line with its energy policies. The book titled "An Energy Policy for the European Union", also known as the White Paper, became a milestone for policies to be followed in the following periods. On the basis of the policies, as in previous policies, there are regulations on ensuring energy supply security, creating a competitive market and protecting the environment.[25]

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[22]S. Dursun. (2011). *Avrupa Birliği'nin enerji politikasi ve Türkiye*. Ankara Üniversitesi Avrupa Toplulukları Araştırma ve Uygulama Merkezi Araştırma Dizisi No: 36, Ankara, s. 49.
[23]Dursun, 2011, **a.g.k.**, s. 60-61.
[24]Dursun, 2011, **a.g.k.**, s. 63-64.
[25]Yorkan, 2009, **a.g.k.,** s. *27.*

By the year 2000, Europe's external dependency ratio in energy increased to 50% and as a result of the researches and forecasts, it was predicted that this rate would increase to 70% in 2020 or 2030 if no measures were taken. In addition, when examined geopolitically, 45% of oil imports are obtained from Middle Eastern countries and 40% of natural gas imports are obtained from Russia. The European Union does not have sufficient opportunities to change its international market. On top of all this, the increase in oil prices at the end of 2000 emphasized the importance of existing risks. This high rate of external dependency poses various risks for Europe and this situation has directed the EU to form new policies. In its policy making efforts to ensure energy supply security, the EU announced its new energy policies, also known as the Green Book, in November 2000. With this Green Paper, the EU has aimed to create a strategy for energy supply security that aims to reduce the risks associated with external dependency. In this context, in addition to creating a strategy on energy supply security, it constitutes the content of the policy in other important issues such as combating climate change, developing the internal energy market and improving relations with non-EU countries. However, the lack of political consensus on the community's energy policies limits the scope of the action. The point is to start discussing these issues rather than proposing a complete strategy that ensures security of supply. Balancing supply policies, promoting renewable energy sources and ensuring the safe management of nuclear wastes in the field of nuclear energy constitute the main lines of the EU's long-term energy strategy by taking steps towards demand policies, especially in the taxation area.[26]

The oil crises in the Middle East and the concerns of the European Community regarding energy supply security have influenced Europe's orientation to the Soviet market for energy supply. In addition, Russia's rich oil and natural gas resources and its neighbor to Europe from the east have been effective in the development of commercial relations between Europe and Russia. On the other hand, the Chechnya and Kaliningrad problems between the EU and Russia, and the disputes over visa and trade quotas, damage this relationship. However, despite such problems, common interests in energy make it easier to establish relationships. Moreover, it is in the interests of both sides that Europe supplies most of its energy needs from Russia and the contribution of this trade relationship to the Russian economy. In line with these interests, the EU and Russia

[26]Commission Of The European Communities [CoEC). (2000). *Green Paper - Towards a European strategy for the security of energy supply [COM(2000) 769 final]*.

emphasized the importance of this interdependence by initiating a bilateral energy dialogue at a summit held in Paris in 2000. The aim of this bilateral dialogue started covers various issues such as energy saving, rationalizing production, energy investment opportunities and increasing common interests. It is planned that this dialogue process will be held annually and that experts as well as senior executives and politicians will participate in the meetings. At the summit meetings, issues related to the connection of electricity networks, the establishment of pipelines that provide energy flow and various infrastructure projects were brought to the agenda.[27]

1.3.1.3. *2005-2014 period*

The Kyoto Protocol, whose foundations were laid in 1997, entered into force on February 16, 2005 due to delays in fulfilling the terms of the agreement. This protocol was negotiated in Kyoto, Japan within the United Nations Framework Convention on Climate Change and opened for signature in 1998 and took its final form in 1999.[28] The Kyoto Protocol ensures the commitment of the countries in the transition to limiting and reducing greenhouse gas emissions in line with the determined targets, increasing the effectiveness of the aforementioned convention and making it functional. The Convention asks countries to implement policies and measures to reduce greenhouse gas emissions and to submit their reports periodically. In line with the targets set by the protocol, 37 industrialized countries and the European Union are requested to reduce their greenhouse gas emission rates by an average of 5% for the period 2008-2012 compared to 1990. There are currently 191 countries and 1 regional economic integration organization that are parties to the Kyoto Protocol. Parties to the Convention that have not signed the Kyoto Protocol can join the Convention at any time.[29]

After the Green Book published in 2000, the EU continued to publish various reports and policies addressing its goals and current situation. The Smart Energy Program for Europe (2003-2006) followed by the Green Paper entitled "Sustainable, Competitive and Safe Energy for Europe" prepared in 2006 are an example of this. The communiqué titled "An Energy Policy for Europe" announced in January 2007 is an energy package

[27]Dursun, 2011, **a.g.k.**, s. 107-108.
[28]https://tr.wikipedia.org/wiki/Kyoto_Protokol%C3%BC (Erişim Tarihi: 21.01.2021).
[29]https://unfccc.int/kyoto_protocol (Erişim Tarihi: 21.01.2021).

that includes the measures to be taken for the energy policy and is a strategic review of the European energy situation.

Periodic changes and arrangements have been made in the founding agreements of the European Union. The most important of these changes in the recent past was made with the Lisbon Treaty. At the summit held on 18-19 October 2000, the Lisbon Treaty, which brought changes to the structure of the European Union and which was reconciled by the member countries, was signed in Lisbon on 13 December 2007. The treaty entered into force on 1 December 2009, after the ratification process in 27 member states was completed.[30] Its aim is to make the EU more democratic, more efficient and better able to address global problems such as climate change with one voice. In this agreement, the framework of the EU's energy policy is also clearly stated. Title XXI / 194 of the Lisbon Treaty constitutes the main lines of the energy policy. Article 194/1 of the agreement sets some targets for the establishment and functioning of the internal market, taking into account the protection and improvement of the environment. These goals are;

1. "Ensuring the functioning of energy markets,"
2. "Ensuring the energy supply security of the European Union,"
3. "To encourage the development of new and renewable energy sources for the efficient and economical use of energy,"
4. "To promote the interconnection of energy networks."[31]

The European Parliament and the Council take the necessary measures by carrying out ordinary legislative activities in order to achieve the objectives of the first article. These measures are only adopted after consultation with the Economic and Social Committee and the Committee of the Regions.[32] These measures do not affect the right of a member state to determine the conditions for the utilization of its energy resources, its choice between different energy sources, and the general structure of its energy supply. In case of any breach of the ordinary legislative procedure, the special legislative procedure applies. In the case of special legislative procedure, only the measures specified in Article 194/2 for financial matters can be taken unanimously in consultation with the European Parliament.[33]

[30]http://www.mfa.gov.tr/lizbon-antlasmasi.tr.mfa (Erişim Tarihi: 21.01.2021).
[31]European Parliament [EP] (2007). *Treaty of Lisbon*, s. 88.
[32]EP, 2007, **a.g.k.,** 88.
[33]EP, 2007, **a.g.k.,** 88.

Another energy policy package with main objectives such as increasing the use of renewable energy and reducing greenhouse gas emissions is Europe's Climate Change Opportunity policy package prepared in 2008. In this context, it is aimed to reduce greenhouse gas use by at least 20% until 2020, to increase the share of renewable energy in EU energy consumption to over 20% and to increase the use of biofuels in the EU transportation sector.[34]

The European Commission published the "Second Strategic Energy Review" declaration on 13 November 2008 in order to secure the energy future of the EU and to protect its fundamental energy interests. This declaration, which has an important place among the EU energy policies, includes a number of new strategies as well as the 2050 targets. In this context, it was emphasized that real progress should be made for the use of the full potential of the oceans and seas for energy production, the rapid development of the transport system and the integration of the European energy market. First of all, it suggests that the 20-20-20 package should be adopted and implemented rapidly among EU member countries, and therefore an "EU Energy Security and Solidarity Action Plan" complementary to the measures put on the table so far.[35]

Another importance of this declaration is that it contains strategic policies on the Mediterranean energy ring. In this context, it was emphasized that a Mediterranean energy ring connecting Europe to the Southern Mediterranean through electricity and gas connections should be completed. Along with this declaration, the Commission aims to publish, no later than 2010, a "Communication on the Mediterranean Environment" outlining the plan for the completion of the missing links, including key projects important to diversify the EU's external energy supply in more remote regions.

The Renewable Energy Directive, which entered into force in 2009 by the European Parliament and the Council of the European Union, aims to increase the share of renewable energy in final consumption to 20%, with each country setting its own national target. According to this directive, 10% of the fuels used in transportation are also aimed to be supplied from renewable sources. This directive was decided to promote energy generated using renewable sources, including wind, solar, aero-thermal, geothermal, hydrothermal and ocean energy, hydroelectricity, biomass, landfill gas, sewage treatment

[34]European Commission [EC] (2008). *20 20 by 2020- Europe's Climate Change Opportunity (COM (2008) 13 final)*. s. 2.
[35]European Commission [EC] (2008). *Second Strategic Energy Review: an EU energy security and solidarity action plan (SEC (2008) 2870).* s. 3.

plant gas and bio gases. The directive also sets sustainability criteria for biofuels and bio liquids.[36]

The European Commission published a new statement on 10 November 2010 titled "Energy 2020 A strategy for competitive, sustainable and safe energy" to support current energy strategies and achieve the 2020 targets. The main objectives of this strategy are to ensure the efficient and efficient use of energy in Europe, to ensure the free circulation of energy, to create a more integrated interconnected and competitive market, to provide safe and affordable energy, to expand Europe's leadership in energy technology and innovation, to establish strong international partnerships.[37]

On 15 December 2011, the European Commission published a declaration titled "Energy Roadmap 2050" to determine the new roadmap in a broader perspective. With the 2050 Energy Roadmap, the EU aims to reduce greenhouse gas emissions by 80-95% below 1990 levels by 2050. The Commission made the necessary analysis for the transition to a competitive and low carbon economy. Challenges were explored to ensure competition in the energy sector and security of energy supply while meeting the decarbonisation goal. Since it is not possible to predict the long term, various scenarios are addressed with the Energy Roadmap 2050 and ways to reduce carbon in the energy system are investigated. To achieve an 80% reduction in greenhouse gas emissions, a number of scenarios have been put forward, which means about 85% reduction in energy-related CO2 emissions, including transport. The scenario analyzes presented examine the effects, challenges and opportunities of possible ways to modernize the energy system. The Energy Roadmap 2050 does not replace national, regional and local efforts to modernize energy supply, but aims to develop a long-term, technology-independent European framework in which these policies will be more effective. Bringing a European approach to the energy problem will ensure security and inter-country cooperation, as well as reduce costs by providing a wider and flexible market for new products and services.[38]

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[36]European Parliament [EP] (2009), *Directive 2009/28/Ec Of The European Parliament And Of The Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC*

[37]European Commission [EC] (2010). *Energy 2020 A strategy for competitive, sustainable and secure energy (COM (2010) 639 final).* s. 5-6.

[38]European Commission [EC] (2011). *Energy roadmap 2050 (COM/2011/0885 final).* s. 2-3.

The policy titled Trans-European Energy Infrastructure [TEN-E] prepared by the European Parliament and the Council of the European Union on 17 April 2013 sets rules for the development and interoperability of cross-border energy infrastructure networks to achieve the EU's energy policy objectives. One of the most important aims of the policy is to ensure the timely and effective implementation of projects of common interest that connect the energy markets of European countries. On this occasion, interconnected energy markets allow the integration of renewable energy sources, security of supply and high competition. In addition, this policy determines the necessary common interest criteria to implement priority corridors and areas that fall under the energy infrastructure categories in electricity, natural gas, oil and carbon dioxide.[39]

In the council meeting held in 2014, the policy titled "A Policy Framework for Climate and Energy for the period of 2020-2030", covering the 10-year period of the EU, entered into force. Within the framework of this policy, it is foreseen that the greenhouse gas emissions of the EU will be reduced by 40% by 2030 compared to 1990 level, the share of renewable energy in total energy consumption will be increased to 27% and energy efficiency will be increased by 27% as a minimum. With the current energy and climate policies, basic objectives such as reducing greenhouse gas emissions, increasing the share of renewable energy and improving energy efficiency are successfully carried out. Thanks to these policies, greenhouse gas emissions decreased by 18% as of 2012 compared to 1990, and this ratio is projected to decrease by 24% and 32% respectively in 2020-2030. The share of renewable energy in final consumption has increased to 13% and it is expected to rise to the levels of 21% in 2020 and 24% in 2030. On the other hand, the carbon density of the EU has decreased by 28% between 1990-2010. Within the framework of the new policy package, it is planned to maintain these targets and to put new targets into practice. Some of the new goals put into practice can be listed as follows;

- "Commitment to reducing greenhouse gas emissions in line with the 2050 roadmap, and following a supportive, cost-effective approach,"
- "the framework of policies should be simplified in line with complementarity and consistency,"

[39]European Parliament [EP] and Council of the European Union [CoEU] (2013), *Guidelines for trans-European energy infrastructure and repealing*. s. 44-48.

- "Member states should be allowed to keep their costs to a minimum, with flexibility in the transition to low-carbon and choosing their own energy mix, taking into account their energy security and specific circumstances,"
- "assist member states to develop and strengthen their cooperation, ensure market integration and prevent market distortion,"
- "While providing a low-carbon and competitive energy system, energy security should be improved by supporting joint action, integrated markets, import diversity, sustainable development of domestic energy resources, investment in necessary infrastructure, end-use energy savings, and research and innovation."[40]

1.3.1.4. 2015 and after

With the "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy" published by the European Commission on February 25, 2015, the action plan for the energy union was announced. The purpose of the Energy Union, which has climate policy at its core, is to provide safe, sustainable, competitive and affordable energy to EU consumers, households and businesses. It is stated in the action plan that radical changes are required in line with these objectives. The vision of the Energy Union can be listed as follows;

- "To ensure solidarity among member states and a structure that speaks with one voice,"
- "providing an intercontinental integrated energy system,"
- "to design a climate-friendly and long-lasting economy,"
- "to ensure that innovative and competitive companies stand out for energy efficiency,"
- "providing qualified workforce that carries the energy sector to the future,"
- "ensuring the investor's confidence in the markets,"
- "and most importantly, to provide an environment where citizens take ownership of the energy transformation."[41]

In order to achieve these goals, it was stated that energy should be moved away from an economic system that is centralized, fossil fuel based, supply-oriented approach, based on old technologies and based on outdated business models. It was emphasized that consumers should be empowered by providing flexible management of supply and demand, providing information and offering options. Within the scope of the Energy

[40]European Commission [EC] (2014). *A policy framework for climate and energy in the period from 2020 to 2030 {SWD (2014) 15 final} {SWD (2014) 16 final} (COM/2014/015 final).*

[41]European Commission [EC] (2015). *A Framework strategy for a resilient energy union with a forward-looking climate change policy (COM/2015/080 final).* s. 2-3.

Union package, a 15-item action plan has also been announced. The action plan described in this context can be listed as follows[42]:

(1) “The first priority for the establishment of the Energy Union is the full implementation and strict follow-up of the current energy legislation,”

(2) “Diversification of gas supply to become more resistant to supply disruptions,

(3) Intergovernmental agreements should be in line with EU legislation and be transparent,”

(4) “The right infrastructure is a prerequisite for completing the energy market, integrating renewable resources and ensuring supply security,”

(5) “The current market design should be revised to create an uninterrupted internal energy market that benefits EU citizens and to improve existing uncoordinated capacity mechanisms in member states.”

(6) “Development of the regulatory framework (especially ACER and ENTSO) to create a smooth domestic market for citizens and companies,”

(7) “In order to create a fully integrated EU-wide energy market, the EU commission develops guidance on regional cooperation and actively cooperates with the Member States and stakeholders in regional areas,”

(8) “Greater transparency at the level of energy costs, prices and public support improves market integration and identifies actions distorting the internal market,”

(9) “Achieving at least 27% energy savings by 2030 in line with the targets set by the EU, reviewing the legal rules on energy efficiency in this context, and making more use of the European funds for the renewal of the houses by the member states,”

(10) “It is planned to determine the energy saving potential of buildings, to make existing buildings energy efficient, to reduce energy costs, in this context, the Commission initiates the "Smart Financing for Smart Buildings" initiative,”

(11) “In order for the EU to accelerate energy efficiency and carbon removal in the transportation sector, the gradual transition to alternative energy sources and the integration of energy and transportation systems should be ensured,”

(12) “The EU takes action within the scope of the 2030 climate and energy framework targets and contributes to international climate negotiations,”

(13) “Creating a new Renewable Energy Package including sustainable biomass and biofuels in line with the EU's goal of at least 27% renewable energy by 2030,”

(14) “Supporting forward-looking R&D studies on energy and climate in order to maintain Europe's technological leadership and expand export opportunities,”

(15) “The EU's use of all external policy tools in a powerful and unified manner to establish a constructive relationship with its partners and to adopt a monophonic structure in terms of energy and climate.”

[42]EC, 2015, **a.g.k.,** 19-21.

The European Commission not only declared the aims and vision of the Energy Union, but also shared some statistics that reveal the current situation with the data of the period. According to the data of 2015, it has shown that the EU imports 53% of its energy and that it is the largest energy importer in the world, declaring that its total cost is approximately 400 Billion Euros. Drawing attention to the fact that the 6 EU member countries have only one external natural gas supplier, it was stated that this is a very vulnerable situation against supply shocks. In addition, it has been determined that 94% of the transportation is based on oil and 90% of it is imported. Looking at the EU in general, it has been concluded that more than 120 Billion Euros of annual subsidies are given for energy and this situation is not sustainable. On the other hand, it has been stated that 1 Trillion Euros is required for energy investments until 2020. Another important and remarkable statistic is that renewable energy companies in Europe have a total annual turnover of approximately 129 Billion Euros and these companies provide more than 1 million jobs. In addition, EU companies hold 40% of all renewable energy technology patents in existence. And the EU wants to maintain its leading role in renewable energy investments globally.[43]

Countries participating in the UNFCCC 21st Conference of the Parties (COP) held in Paris on December 12, 2015 have signed an agreement to tackle climate change and accelerate the investments and actions required for a sustainable low-carbon future. The main purpose of this agreement, known as the Paris Agreement, is to strengthen the global response to the threat of climate change by keeping the global temperature rise below 2 degrees Celsius and above pre-industrial levels and to limit the temperature increase to 1.5 degrees Celsius. This agreement sets a framework for issues such as long-term temperature target, national contributions, mitigation, sinks and reservoirs, voluntary cooperation, adaptation, loss / damage, transparency, financing technology and capacity support in line with the fight against climate change. The parties to the agreement are required to make maximum effort through nationally determined contributions. The Paris Agreement, which was opened for signature on April 26, 2016, entered into force on November 4, 2016, 30 days after the approval of 55 countries that make up at least 55% of global emissions. There are 197 countries that are party to the convention as of 2021.[44]

[43]EC, 2015, **a.g.k.,** 2-3.

[44]https://cop23.unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement/key-aspects-of-the-paris-agreement (Erişim Tarihi: 03.02.2021).

The Clean Energy Package for All Europeans, one of the steps towards the implementation of the Energy Union strategy published in 2015, was signed on 30 November 2016. The package consists of 8 legislative acts and is planned to be completed in 2019 with the agreements foreseen to be made between May 2018 and May 2019. Within the scope of this package, targets after 2020 have been set. Providing priority to energy efficiency, achieving global leadership in the field of renewable energy and taking care of consumers are some of these goals. Issues on energy efficiency, renewable energy, electricity market, electricity supply security and the management of the Energy Union form the outline of the package.

With the directive published in 2018, the targets for 2030 in the field of renewable energy were revised and targets for increasing the share of renewable energy in final consumption to 32% were specified. With regard to energy efficiency, the target for 2030 has been revised as a minimum of 32.5% and the steps to be taken in this direction have been determined. Regarding the management of the Energy Union, it was decided to implement a simple, robust and transparent governance model that aims to give confidence to investors in the long term and supports predictability. Within the scope of the package, countries were asked to prepare a 10-year national energy and climate plan covering the years 2021-2030. Within the scope of the package, the directive published in 2019, with the new regulation regulating electricity markets, set targets for the EU to allocate a larger share to renewable energy in electricity markets and to develop cross-border energy infrastructures.[45]

With the directive published by the European Parliament and the European Union Commission on April 17, 2019, regulations were made on the natural gas domestic market. While EU law applies to the territorial waters and exclusive economic zones of the member states, the Gas Directive published in 2009 clearly does not contain a legal framework for gas pipelines to and from third countries. With the amendment made in the directive in 2019, it aims to comply with EU laws for all major gas pipelines entering the EU borders, to be transparent and accessible, and to operate efficiently. It contains regulations on the implementation of gas transmission links of Member States with third countries and on existing connections.[46]

[45]European Commission [EC] (2016). *Clean Energy For All Europeans COM (2016) 860 final.*

[46]European Parliament [EP], Council of the European Union [CoEU] (2019). *Amending Directive 2009/73/EC concerning common rules for the internal market in natural gas.*

Within the scope of the multi-year financial framework proposed by the European Commission for the period 2021-2027 in 2018, 25% (approximately 320 Billion Euros) of EU expenditures should be managed in climate-related activities. Later, the legal framework covering the same period and regulating the use of cohesion policy financing was determined. The main priority of EU investments in 2021-2027 is to create a greener, low-carbon Europe by promoting clean and equitable energy transition, green and blue investment, circular economy, climate adaptation and risk prevention and management. As part of the European Green Deal adopted by the European Commission in 2019, it was proposed to create a Just Transition Mechanism (JTM) to be added to the Just Transition Fund (JTF) to effectively and fairly achieve the EU climate neutrality goal. It was emphasized that JTM should focus on the regions and sectors most affected by the transition due to its fossil fuel dependency. The aim was set to reduce the impact of the transition by financing the diversification and modernization of the local economy and mitigating negative impacts on employment. To achieve its goal, JTF will support investments in areas such as digital connectivity, clean energy technologies, emissions reduction, renovation of industrial sites, worker revitalization and technical assistance. JTM consists of 3 fundamentals[47]:

> (1) "a jointly managed Fair Transition Fund (JTF),"
>
> (2) "A custom plan under the InvestEU program,"
>
> (3) "A public sector loan facility provided by the European Investment Bank (EIB) to stimulate additional investments in the respective regions."

It is planned that the Just Transition Fund will be used for grants, the special transition plan in the InvestEU program will be used for private investments, and the European Investment Bank's activities will benefit from public funding.

Approximately 85% of the buildings in the EU (about 220 million buildings) were built before 2001. Nearly 95% of the existing buildings are expected to survive until 2050. However, many of the existing buildings are inadequate in terms of energy efficiency. Because these buildings generally use fossil fuels and old technologies with low energy efficiency in heating and cooling. About 40% of the energy consumption of the EU comes from buildings and is responsible for 36% of the EU's greenhouse gas emissions. With the pandemic, the closure of people to their homes has increased the time spent in the

[47]European Parliament [EP], Council of the European Union [CoEU] (2020). *Establishing the Just Transition Fund.*

houses and therefore the energy consumption of the buildings has increased. The expectation that the impact of the pandemic will continue in the long term has caused the EU to reconsider the energy and resource profiles of the buildings. This opportunity, which emerged to make buildings suitable for a greener and digital society, emphasized the importance of renewal. In line with the 2030 Climate Target Plan, the Commission has proposed a reduction of greenhouse gas emissions by at least 55% by 2030 compared to 1990. The intermediate goals aimed to achieve this goal are as follows[48]:

(1) "The EU should reduce the greenhouse gas emissions of buildings by 60% by 2030,"

(2) "The EU should reduce its total energy consumption by 14%,"

(3) "The EU should reduce the energy consumption used for heating and cooling by 18%."

For these reasons, the urgency of the EU to focus on buildings with higher energy efficiency, less carbon intensity and more sustainable has been emphasized. While mentioning the benefits of renewal, it was mentioned about reducing energy bills and reducing emissions, as well as making buildings greener, resistant to natural events, accessible and more suitable for bicycles. In addition to these, the benefits of using smart building technologies and the advantages of the renewal method instead of making a new construction from scratch are also mentioned. Moreover, investments to be made in buildings through renovation activities can be seen as a stimulus needed by the construction industry and the economy. It is important in this respect that the renovation efforts will affect various supply chains and the labor sector. It is also a positive effect that SMEs are among the most affected sectors due to the pandemic and that the renewal works will also be reflected in them. At the end of these policies, the aim to achieve by 2030 is to double the annual energy renewal rate in residential and non-residential buildings and to encourage energy renewal.[49]

The basic principles of the building renewal policy for 2030 and 2050 have been determined. The EU needs to adopt a comprehensive strategy to implement these principles. These principles can be listed as follows:

(1) "Energy efficiency,"

(2) "Affordability to spread energy-efficient and sustainable buildings to a wide range,"

(3) "Carbonization and integration of renewable energies,"

(4) "Life cycle thinking and cyclicity,"

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[48]European Commission [EC] (2020). *A renovation wave for Europe- greening our buildings, creating jobs, improving lives. s. 1-2.*

[49]EC, 2020, **a.g.k.,** 1-3.

(5) “High health and environmental standards,”

(6) “To address the challenges of the green and digital transition process together,”

(7) “Aesthetics and architectural quality should be respected.”[50]

The agreement on the withdrawal of the United Kingdom of Great Britain and Northern Ireland from the European Union and the European Atomic Energy Community became formal on January 31, 2020. However, it was emphasized that nothing in effect in accordance with the determined transition period will not change before December 31, 2020. With a new agreement published in the Official Journal of the European Union on 31 December 2020, the United Kingdom of Great Britain and Northern Ireland cooperated with the European Union and the European Atomic Energy Community on the security and peaceful use of nuclear energy. The main purpose of the agreement is to ensure that the parties cooperate in the peaceful use of nuclear energy, the framework of the agreement is only for peaceful purposes and that it is not used for any military purpose, such as the use of nuclear weapons and nuclear explosive devices and research development.[51] The scope of this agreement between the parties is clearly stated in the third article as follows.

Article 3:

1. “To facilitate trade and commercial cooperation,”
2. “The supply of nuclear and non-nuclear materials and equipment,”
3. “Technology transfer, including the provision of information,”
4. “The supply of equipment and devices,”
5. “Access and use of equipment and facilities,”
6. “Safe management of spent fuel and radioactive waste, including geological disposal,”
7. “Nuclear safety and radiation protection, including emergency preparedness and monitoring of radioactivity levels in the environment,”
8. “Nuclear safeguards and physical protection,”
9. “Use of radioisotopes and radiation in agriculture, industry, medicine and research; In particular, to minimize the risks of medical radioisotope supply shortages and to support the development of new technologies and treatments involving radioisotopes for the benefit of public health,”
10. “Geological and geophysical exploration, development, production, further processing and use of uranium resources,”

[50]EC, 2020, **a.g.k.,** 3-4.

[51]United Kingdom [UK], The European Atomic Energy Community [EURATOM] (2020). *Agreement Between The Government Of The United Kingdom Of Great Britain And Northern Ireland And The European Atomic Energy Community For Cooperation On The Safe And Peaceful Uses Of Nuclear Energy*, Official Journal of the European Union. s. 1-3.

11. “Regulatory aspects of the peaceful use of nuclear energy,”
12. “Research and Development and,”
13. “Other areas relevant to the subject of this agreement, which may be mutually determined in writing by the parties after consultations in the Joint Committee.”[52]

On the same date, another agreement, which entered into force on December 31, 2020, was signed between the European Atomic Energy Community and the Government of the Republic of India for research and development cooperation in the field of peaceful use of nuclear energy.

Finally, the energy-related policy is the regulation published on January 24, 2021 to create the nuclear decommissioning aid program of the Ignalina nuclear power plant in Lithuania and to repeal the Regulation. This policy covers the period from the beginning of 2021 until the end of 2027 and entered into force to determine the program for the abolition of the specified nuclear power plant. This law sets a framework for the dismantling and purification of equipment and reactor shafts as a result of the termination of the plant's operations, and the management of radioactive waste. The budget allocated for the program was determined as 552 million Euros and it is planned to be used to cover all kinds of activities for the implementation of the program.[53]

1.3.2. Historically energy policies in Turkey

Turkey is a country that's energy consumption increase with increasing industrialization and growing population. Various energy resources are used in consumption, but the share of natural gas and oil is higher than other energy resources. Türkiye enerji kaynakları açısından zengin bir bölgede yer almasına rağmen, tüketimde kullanılan birincil enerji kaynakları ithal edilmektedir. When foreign trade statistics are examined, while the total import was 219 billion dollars in 2020, the section "Mineral fuels, mineral oils and products obtained from their distillation, bituminous materials, mineral waxes" was realized as 28.9 billion dollars.[54] However, considering that the pandemic crisis in the world has affected all markets, it is very difficult to understand

[52]UK and EURATOM, 2020, **a.g.k.,** 4.
[53]Council of the European Union [CoEU] (2021), *Establishing the nuclear decommissioning assistance programme of the Ignalina nuclear power plant in Lithuania and repealing Regulation (EU) No 1369/2013.*
[54]Türkiye İstatistik Kurumu [TÜİK] (2020). *Dış Ticaret İstatistikleri.*

whether this decrease in 2020 compared to previous years is due to the decrease in the sectoral energy demand or the decreased consumption. Therefore, it will be useful to look at the 2019 data. According to 2019 data from Turkstat, Turkey's total imports in 2019 was about 210 billion dollars and imports amounted to about 41.1 billion dollars in energy.[55] When the energy import data of the last 10 years are averaged, the imported energy is on average 43.5 billion dollars annually. It is clear that high energy imports which are directly affecting the foreign trade deficit make Turkey dependent on foreign energy. In terms of the security of energy supply, the high energy imports increase the importance of energy policy for Turkey.

There are some elements that form the basis of Turkey's energy policies and strategies which can be summarized as follows:

(1) "Prioritizing energy security related activities, taking into account the increasing demand and import dependency,"

(2) "Considering environmental concerns at every stage of the energy chain in the context of sustainable development,"

(3) "Creating a transparent and competitive market by ensuring the necessary reform and liberalization, increasing productivity and efficiency,"

(4) "Increasing R&D studies related to energy technologies."[56]

In order to achieve the goals within the framework of these strategies, some intermediate targets have also been determined. "It is aimed to diversify the resource route for the supply of imported hydrocarbon energy resources, oil and natural gas, to increase the share of domestic and renewable energy, to increase energy efficiency and to include nuclear energy in the energy basket".[57]

In this part of the study, it has been examined the binding elements forming the country's road map such as Turkey's energy policies, agreements, and programs executed from past to present. To better understand the energy policy of the Republic of Turkey is necessary to look at the energy activities in the late Ottoman period. In this context, the policies starting from the pre-republic period to the present are divided into 5 periods.

[55]TÜİK, 2020, a.g.k.

[56]https://www.mfa.gov.tr/turkiye_nin-enerji-stratejisi.tr.mfa (Erişim Tarihi: 18.03.2021)

[57](http-2).

1.3.2.1. *Pre-republican period*

Before the establishment of the Republic of Turkey, the Ottoman Empire in the early 19th century, conduct activities about mining coal in various regions of Anatolia. There was a demand for coal in places such as mint, arsenal, and shipyard, but the transition to steamships especially in the navy increased the need for coal. Meeting the coal need through imports created a great burden in the Ottoman economy. For this reason, the necessity of operating coal mines in the country has arisen. Before Ereğli coal mines were discovered, it is known that there were coal mines operated in the mountainous regions of Marmaris, İçel and Alanya. However, the operating rights of the mines here were given to the Egyptian Governor Kavalalı Mehmet Ali Pasha in 1805.[58] The need for coal has led to the exploration of coal in different regions, especially by the marines' own efforts. The importance of this mine was explained to the soldiers by showing samples of coal and a reward was given to those who found it. It is accepted that the first discovery of coal was made by Uzun Mehmet in the village of Neyren in 1829. With the discovery of Uzun Mehmet, it was understood that the region had rich coal deposits, but the processing of hard coal started in 1848. Since there was no mining company in the periods when the coal basin was discovered, the mines were operated by state institutions in some periods and by capital owners such as jewelers and bankers in some periods. In 1849, the operation of the coal mines of the Zonguldak basin was transferred by the state to the Galata moneychangers.[59]

With the Paris Peace Treaty signed after the 1854-1856 Crimean War, Britain and France obtained coal mine operation privileges in the Ottoman territories. The "Land Code" issued in 1858 paved the way for foreigners to acquire property in the country. Again, the "Law of Acquisition of Property by Foreigners", which entered into force in 1867, caused foreigners to take a more active role in mines. The "Maadin Regulations" issued in 1861 made it easy to operate the mines. Since the Ottoman Empire could not pay its foreign debts, the mines were privatized and foreign companies started to operate the mines. However, the increasing need for coal and meeting the need with imports created a great burden in the economy. The "Regulations (Nizamname)" prepared by

[58]Y. Kaştan (2016). *Osmanli İmparatorluğu'nda Kömür Ocaklarinin İşletilmesi (1839- 1918).* Osmanlı Medeniyeti Araştırmaları Dergisi, 2(2), s. 3-4.
[59]E. Kömürlü (2020). *Osmanlı Döneminde Taş Kömürü Madenciliğinin Başlaması.* Yer Altı Kaynakları Dergisi, (18), s. 22-23.

Dilaver Pasha in 1867 in order to benefit more from the mines came into effect.[60] However, in general, since the discovery of coal, the Ottoman Empire could not get the efficiency it wanted from the mines and foreign companies were active in the energy sector. In World War I, coal mines became even more important for navies and factories. As a matter of fact, Russia's strategic attacks against the Zonguldak region during the First World War is the biggest indicator of this.[61]

Later, it was realized that the coal gas obtained from the distillation of coal could be used as energy and it was used first for lighting and then for cooking. In 1880, gas was started to be used in houses to meet the heating need. Dolmabahçe Gazhane was established in Istanbul in 1853 for gas production. This facility was used for the illumination of the palace in the beginning and then the illumination of Beyoğlu Street was provided from here. In 1857, Paris Gas Company established a gas factory in Izmir with a 40-year concession from the Ottoman Empire. Gas shops were established in various places in Istanbul and Anatolia with the widespread use of coal gas later on. Cables used for coal gas were later used for electricity transmission.[62]

The first power plant established in the Ottoman Empire is a small water power plant established in Adana in 1902. Although Sultan Abdulhamit II did not support such initiatives for various reasons, electricity was started to be produced with a small-scale dynamo on the Berdan River after the necessary permissions were obtained. Later, another plant was built on the Avenye Bendi in the same area. With the occupation of the region during World War I, France took control of power plants and received wages from the public per lamp in their homes. After the city got rid of the occupation between 1921-1922, the electric turbines continued to be used after being repaired. In the Ottoman period, many public services, including energy services such as electricity and coal gas, were provided by concessionary foreign-owned enterprises. During the reigns of Sultan Abdulaziz and Abdulhamit II, it was aimed to encourage domestic and foreign companies in the country to produce. In this context, free raw material support was provided, and tools, equipment, and machinery to be brought from abroad were exempted from customs duty. With the specification prepared in 1910, the government opened a tender for the

[60]Kaştan, 2016, **a.g.k.**, 11-12.

[61]A. Baş (2019). *I. Dünya Savaşı'nda Rusya'nın Zonguldak'a Yönelik Saldirilari (1914-1915).* Karadeniz Uluslararası Bilimsel Dergi, (42), s. 14-34.

[62]N. Özdemir (2016). *İmparatorluktan Cumhuriyete Türkiye'de Elektriğin Tarihsel Gelişimi (1850-1938).* Osmanlı Medeniyeti Araştırmaları Dergisi, 2(3), s. 18-20

establishment of a facility to provide the necessary electricity to Istanbul. Hungary-based Ganz Electronic Incorporated company won this tender. With the agreement, the production and administration of Istanbul's electrical energy were given for 50 years. Later, in 1911, the name of the company was changed to Osmanlı Electricity Incorporated company and its headquarters was changed to Istanbul. However, due to the flood disaster that occurred during the period and World War I that followed, the power plant started its activities in 1914. In addition to electricity initiatives in Istanbul, there have been attempts to generate electricity in cities such as Izmir, Damascus, Beirut, Edirne, Adana, Aleppo, Eskisehir, and Samsun. In some regions, electricity generation is again given to foreign companies, while in others it is given to municipalities or domestic enterprises.[63]

Finally, the discovery of oil in the Ottoman Empire was made at the end of the 19th century. It was understood that the oil found in the exploration works carried out in the Kabaev sub-district of Iskenderun, which was connected to the city of Aleppo at that time, was oil after the tests carried out by Chemist Moreau in Istanbul in 1887. Ahmet Necati Efendi, who found the oil, applied for the business to be given to him. However, since there was no oil enterprise in the Ottoman Empire, the issue was discussed by the government officials, and a new specification and contract was prepared to comply with the Maadin Regulation. In the specification prepared, it is stated that the area where the oil will be extracted, the amount of tax to be paid, the type of production, the taxes and customs duties to be paid for export, the security in the mine area, as well as the area where the mining work will be carried out should be 150 meters away from the waterway, dam, highway, and railway.[64] The specification and contract prepared was approved by Abdulhamid II on June 14, 1889 and entered into force. This oil concession in the Iskenderun region was abolished on January 15, 1916. The concession of the İskenderun Petrol Company at the time of its dissolution was abolished by Şûrâ-yı Devlet, the counsel at the time.

In the period of 1888-1889, as a result of the discovery of oil by Germany and France in the Baghdad and Mosul regions, Abdülhamit II issued an edict in which the oil areas were declared his private property. In this period, the issue that brought the oil competition back to the agenda is that Germany acquired ownership of the places where

[63] Özdemir, 2016, **a.g.k.**, 20-25.

[64] İ. Bostan (1990). *Osmanli Topraklarında Petrolün Bulunuşu ve İskenderun'da İlk Petrol İşletme Çalışmaları.* Coğrafya Araştırmaları Ankara, s. 129-132.

the railway line passed within the scope of the Istanbul-Hejaz railway project and obtained the privilege of extracting and operating underground resources. Although this situation drew the reaction of Britain and France, oil concessions were also given to the British by the Ottoman government in 1909.[65] In this context, the oil resources discovered in the Ottoman Empire were shared by companies controlled by Germany and England.

1.3.2.2. *1923-1950 period*

It is understood that the reasons such as the energy sector is directly open to domestic and foreign capital, the privileges are given to foreign countries due to the Ottoman foreign debts, and the energy market has a structure that is far from the competitive environment, etc. caused the inefficient use of energy before the Republic. When the Republic was proclaimed in Turkey, there were 38 power plants with 32.8 MW of installed capacity and an annual power generation of 44.5 GWh. 14 of these plants belonged to individuals, 13 to partnerships, and 11 to municipalities. After the war the Republic of Turkey with the designated new borders, electricity was available only in places such as Istanbul, Adapazarı, and Tarsus. While it was known that approximately 94% of the total population lived in cities without electricity at that time, the per capita electricity consumption was recorded as 3 kWh.[66]

The Izmir Economy Congress held in 1923 is the basis of the policies implemented in the early years of the Republican era. It is emphasized that priority should be given to energy investments because insufficiency in energy and infrastructure will adversely affect economic development at this Congress that laid out the economic foundations of the Republic of Turkey. As the cyclical nature of the period, the first years of the republic in Turkey have been dominated by liberal policies. Industry incentives given in this period can be considered as an indicator of this. However, with the economic crisis that shook the entire world beginning in the US in 1929, Turkey started to conduct statist policies.

In the early years of the Republic, there was electricity production in some regions, but the post-war lack of qualified personnel and capital paved the way for foreign capital to enter the country. The Ankara government continued the existing contracts with people

[65]U. Akalın ve S. Tüfekçi (2014). *Türkiye'nin Petrol Politikalari ve Enerji Özelleştirmelerine Bir Bakış.* Journal of Economic Policy Researches, 1 (1), s. 53-54.
[66]Türk Sanayicileri ve İş İnsanları Derneği [TÜSİAD] (1998). *21.Yüzyıla Girerken Türkiye'nin Enerji Stratejisinin Değerlendirilmesi.* Yayın No.TÜSİAD-T/98-12/239, s.243-244.

and companies that received electricity concessions during the Ottoman period. At the same time, new concessions were given to foreign companies. While the electricity generation privileges of Ankara and Adana cities were given to German companies, the electricity generation concessions of cities such as Balıkesir, Bursa, Mersin, Gaziantep, Tekirdağ and Edirne were given to Italian companies.[67]

In the first years of the Republic, hard coal enterprises were under the control of companies with French capital. On the other hand domestic and privately-owned Türkiye İş Bank has also attempted to operate hard coal business venture. However, later, the Havza Economics Directorate undertook the operation of the coal mines. Lignite production remained in the private sector.[68]

In the early years of the Republic, the government also engaged in oil exploration activities. In this context, investigations have been made by geologists who are experts in their fields in various regions of the country and the reports of the investigations have been submitted to the Ministry of Economy, General Directorate of Mining. In 1926, 2 different petroleum exploration licenses were granted one to the Turkish Commercial and Industrial Bank, one to a person. With the Petroleum Law No. 792 enacted on March 24, 1926, all petroleum exploration and operation powers were gathered in the government.[69] However, in the following years, oil exploration studies were carried out by privileged people, especially in the eastern regions of the country. With the "Law No. 2189 on the Establishment of Gold and Petroleum Exploration and Operation Administrations", which entered into force in 1933, the state directly undertook petroleum exploration activities. In this context, the petroleum exploration authority has started to be exercised by the Gold and Petroleum Exploration and Operation Administrations under the Ministry of Economy. This organization then commissioned experts it brought from abroad to conduct exploration in regions with oil potential. As a result of the works, it was decided to drill in Mardin Midyat region, but as a result of the drilling, the work was suspended when water came out of the well.[70]

In the first years of the proclamation of the Republic, one of the most important issues in foreign policy was the Mosul problem, which is known to have rich oil reserves.

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[67]Özdemir, 2016, **a.g.k.**, 25.
[68]TÜSİAD, 1998, **a.g.k.**, 244.
[69]N. Yurtoğlu (2017). *Cumhuriyet Döneminde Türkiye'de Petrol Arama Politikaları (1923-1950).* Gazi Akademik Bakış, 10(20), s. 148-149.
[70]Yurtoğlu, 2017, **a.g.k.**, 149-150.

After the the establishment of the Republic of Turkey intensive efforts have been made to remain in Turkey for Mosul, located in the Ottoman Empire before World War 1. However, as it directly concerns Britain's oil interests, the Mosul Problem could not be resolved in the Lausanne Treaty.[71] In 1926, the Mosul Problem was brought to the League of Nations. This unresolved problem was later brought to the Supreme Court of Justice. However, no solution was found here either. Finally, the UK and Turkey treaty was signed in Ankara on June 5, 1926. It was approved and accepted by the Turkish Grand National Assembly on 7 June 1926. The articles of this agreement are as follows:

- "Mosul and Kirkuk provinces will be given to Iraq."
- "The Iraqi border was clearly defined by the decision of the League of Nations on October 29, 1924."
- "Both states will accept the border decision stated by the League of Nations and will not take any action to overturn it."
- "It was agreed that the border between Turkey and Iraq is Brussels line."
- "Iraq will give Mosul's oil revenues of 10% to Turkey for 25 years."
- "Turkey has taken this money for 4 years but has given up the right to the remaining 21 years of 500,000 pounds in England's favor."
- "Turkey and Iraq signed between friendly states "extradition" has decided to call."
- "Chapter 2 of the treaty will remain in effect for ten years after its entry into force."
- "After 10 years, one of the parties will have the right to dissolve."
- "The items will be approved by the parties and will be immediately sent to Ankara."
- "After the treaty has been ratified, it will be sent to the states that have signed the Lausanne Treaty."[72]

While these agreements, Turkey has earned the right to obtain a share of the Mosul oil revenues for 25 years. However, referred to in Article 6. "Turkey has given up on this" issue is controversial. So much so that Turkey has taken the share of oil revenues from Iraq until 1954. However, it could not get the £ 2,000,000 from this share from General Kasım, who came to power with the coup in Iraq in 1958, and even this share was recorded as receivable in the income book until 1986. In 1986, during the government of Turgut Özal, this claim was abandoned in order to improve relations with Arab countries.[73]

[71]Akalın ve Tüfekçi, 2014, **a.g.k.**, 53.
[72]https://tr.wikipedia.org/wiki/Ankara_Antla%C5%9Fmas%C4%B1_(1926) (Erişim Tarihi: 05.03.2021).
[73]S. Kılıç (2008). *Musul Sorunu ve Lozan.* Atatürk Araştırma Merkezi Dergisi, 24(71), s. 337

After the economic crisis that started in the USA in 1929, statist policies gained importance. The effects of this crisis is also reflected in Turkey. Due to the insufficient capital accumulation in Turkey, the necessity of state intervention in the economy has been understood. In this context, with the "First Five-Year Industrial Plan" put into effect in 1933, it was understood that industrialization was possible with cheap energy and it was requested to research the thermal and hydraulic resources in the country. In addition, by making arrangements in the 1913 law, which remained from the Ottoman Empire, the tax, duty and fee exemption of privileged partnerships was abolished in 1932-1933.[74] With the Municipality Law enacted in 1933, municipalities have the authority to establish and operate electricity facilities. Institutions such as the Municipalities Bank (Iller Bank), Etibank and the Electricity Works Study Administration (EIEI), which were established on these dates, also show that energy policies are given importance. In addition, new institutions for oil and mineral exploration have been established. The petroleum exploration organization was established in 1933 and the Mineral Research and Exploration Institute (MTA) in 1935. The main task of the Mineral Research and Exploration Institute, which was established with the law no. 2804, was explained in the official newspaper of the period as follows:

> ***ARTICLE 2 –***
>
> *"To investigate whether there are mining and quarry sites suitable for operation in our country and what the operation of the operated mines and quarries is more beneficial, To do all technical and scientific works such as performing search operations, scientific and geological investigations, chemical analysis and scientific experiences, get a map, depicting plan, projection, and figures, draw up projects and scientific reports, calculations of profitability, and to train Turkish engineers, science officers, foremen and specialized workers to work in the country's mines and mining industry*".[75]

The "Second Five-Year Industrial Plan" prepared included important issues such as mining, petroleum, coal-based synthetic fuel, alcohol and power plants to be added to gasoline, but this plan could not be put into practice with the death of Atatürk and the beginning of the Second World War.[76]

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[74]TÜSİAD, 1998, **a.g.k.**, 244-245.
[75]T.C. Resmî Gazete 22 Haziran 1935, Sayı: 3035, Kanun No: 2804.
https://www.resmigazete.gov.tr/arsiv/3035.pdf (Erişim Tarihi: 05.03.2021).
[76]TÜSİAD, 1998, **a.g.k.**, 245.

Another important development in this period was the acquisition of the hard coal mines of the French-owned Ereğli Company by the state in 1936 and their transfer to Etibank. Between 1938-1944, all foreign capital and privileged foreign electricity partnerships in the country were nationalized. These events are important developments within the scope of nationalization steps. MTA continued its oil exploration activities, but due to limited resources, the desired amount of oil could not be found from the drillings. In 1940, MTA discovered the first oil deposit in Siirt's Raman region. Again in 1945, with the works carried out in Siirt Garzan region, oil production started in this region and by 1950, 18 thousand tons of oil was produced.[77]

Development efforts were successfully carried out with industrialization steps and various initiatives that started in 1930 and after. However, the Second World War that started was an important factor preventing the continuation of these efforts. In the new development program prepared after the Second World War, energy projects of Etibank were emphasized. The desired credit could not be obtained from the industrialization and energy projects that were requested to be evaluated within the scope of the European Development Program and submitted to the USA. Then the World Bank has proposed Turkey to the establishment of smaller plants instead of major dams and hydroelectric plants.[78] Petrol Ofisi was established in 1941 to meet the increasing demand for oil in the country during this period. During this period, an Energy Department was established within Iller Bank to prepare and implement energy projects in residential areas. While the oil exploration works of MTA were continuing, continuous production started due to the yield from the newly opened wells towards 1949.[79]

In the period of 1923-1954, known as the "National Period", 76 drilling wells were drilled in the country, of which 37 were for exploration activities, 7 for determination, 13 for production and 19 for testing purposes. More than 95,000 tons of oil was produced from the wells opened and 84 million TL was spent in return. During this period, the economic and strategic value of oil was understood, and the state played an active role at this point. However, the expected efficiency could not be achieved due to technological inadequacies and capital deficiencies.[80] When the period between 1923-1950 is examined

[77]TÜSİAD, 1998, **a.g.k.**, 245.
[78]TÜSİAD, 1998, **a.g.k.**, 245.
[79]A. Demir (1980). *Türkiye'de Cumhuriyet Döneminde Enerji Politikaları*. Ankara Üniversitesi SBF Dergisi, 35 (01), s. 113-114.
[80]Akalın ve Tüfekçi, 2014, **a.g.k.**, 56.

in general, it is understood that a country that has come out of the war has a period that witnessed many innovations in its re-development effort. So much so that the newly established Republic of Turkey understand the importance of the development with the industry and therefore energy needs and has taken steps in this direction. The newly established institutions, laws passed and energy exploration studies are an indication of this.

1.3.2.3. *1950-1980 period*

Since the foundation of the Republic, many efforts have been made in terms of development and important steps have been taken towards industrialization. Although "liberal" policies came to the fore at the beginning of this period, liberalism was not fully realized, instead an interventionist economic model was maintained. The failure of liberalism to be implemented at the desired level and nearly 50% of the investments made by the state led to the formation of a mixed economic model in the country.[81] Within the scope of the mixed economy, it is based on focusing on the private sector and attracting foreign capital to the country. The fact that the Turkish National Committee of the World Energy Conference, which was established in 1949, convened the First Advisory Energy Congress in 1953 is an important development within the scope of the energy policies of this period. In this congress, reports were prepared on the energy needs of the country and what kind of studies were done to meet these needs, the development of electricity production and consumption in the country, the access to the resources used in energy production, and the energy facilities that were attempted to be established.[82]

In this period, four private-owned joint-stock companies were established without foreign capital regarding electricity business and regional concessions were granted to them. In 1952, the Kuzeybatı Anadolu Elektriklendirme Turkish Joint Stock Company was granted a concession to produce electricity in the Sarıyar Dam and to sell it in Northwest Anatolia, but the company could not be permanent. In 1953, the concession was given to Çukurova Elektrik Turkish Joint Stock Company for generating, distributing, and transporting electricity from the Seyhan Dam and Hydraulic Power Plant and the company still continues its activities. With the concession given for Gediz

[81]S. Sertel ve M.B. Sanyürek (2016). *Demokrat Parti Dönemi Ekonomi Politikaları ve Verdor Raporu*. The Journal of International Social Research, 9(42), s. 749-750.
[82]TÜSİAD, 1998, **a.g.k.**, 246.

Demirköprü Dam and Hydraulic Power Plant in 1955, Ege Elektrik Turkish Joint Stock Company could not be permanently and was liquidated in 1973. In Antalya Kepez, the concession has been granted to Kepez and Antalya Havalisi Power Plants Turkish Joint Stock Company for the establishment of a hydroelectric power plant, electricity generation, distribution, and sales of the generated electricity, and the company continued its activities. However, these privileges were terminated in 1998 with the decision of the Council of State. Hydroelectric power plants also come to the fore in the electrification activities of this period. In this context, State Hydraulic Works (DSI) was established in 1953 to build large dams. In the period until 1960, the installed capacity of both thermal power plants and hydroelectric power plants and thus electricity production, electricity consumption per capita, and the population benefiting from electricity increased.[83]

When the oil policies of the period are examined, this period was a period when statism was abandoned in oil exploration and production. The Petroleum Law No. 6326 of 1954, which paved the way for foreign capital and private enterprise to oil resources, is one of the important developments of this period. The purpose of this law in the second article is stated as follows: "The purpose of this law is to ensure that it is developed and evaluated in a fast, uninterrupted and efficient manner of oil resources of the Republic of Turkey with private enterprise and investments."[84] Another law supporting this law that published in the same dated Official Journal and accepted is Law No. 6327 for the establishment of Turkey Petroleum Corporation (TPAO). The purpose of this law in the second article is stated as follows: "Within Petroleum Law, to do oil affairs and, if necessary, the purchase, sale, and distribution of petroleum and petroleum products in Turkey, and to engage in all kinds of commercial transactions for the business within the scope of activity, establishing trade companies related to its activities, to be able to partner with such companies established in Turkey and foreign countries."[85] With the establishment of TPAO, the petroleum-related duties and powers of the Mineral Research and Exploration Institute were transferred to this institution. TPAO has undertaken the task of conducting hydrocarbon exploration, drilling, production, refinery and marketing activities in the country on behalf of the government. Petroleum Office Directorate was

[83]TÜSİAD, 1998, **a.g.k.**, 246.
[84]T.C. Resmî Gazete 16 Mart 1954, Sayı: 8659, Kanun No: 6326.
https://www.resmigazete.gov.tr/arsiv/8659.pdf (Erişim Tarihi: 08.03.2021).
[85]T.C. Resmî Gazete 16 Mart 1954, Sayı: 8659, Kanun No: 6327.
https://www.resmigazete.gov.tr/arsiv/8659.pdf (Erişim Tarihi: 08.03.2021).

established to monitor and supervise the implementation of Petroleum Law No. 6326 and this institution was transformed into the General Directorate of Petroleum Affairs in 1973. With the amendment made in the Petroleum Law in 1957, private capital companies, regardless of domestic and foreign, were given the right to establish refineries. During this period, 58 foreign companies benefited from this law and invested in the country.[86]

Innovation in the field of coal in this period is that the establishment of the Turkey Coal Enterprises Authority (TKI) in 1957. Coal management, previously at Etibank has transferred to the Turkey Coal Enterprises Authority (TKI) with the establishment of this institution. In this period, while coal production increased, the share of the private sector in lignite production also increased.[87]

One of the most important turning points in energy policy in Turkey, founded in 1963, the Ministry of Energy and Natural Resources (MENR). Established with Law No. 4951, MENR acts with the mission of "Making the highest contribution to the country's welfare by utilizing energy resources and natural resources in an efficient and environmentally friendly manner" and the vision of "A safe future in energy and natural resources". Today, there are relevant and related organizations affiliated to MENR for the determination and execution of energy policies. These are shown below:[88]

- "General Directorate of Mineral Research and Exploration (MTA), Affiliate"
- "General Directorate of Mining and Petroleum Affairs (MAPEG), Affiliate"
- "General Directorate of Elektrik Üretim AŞ (EÜAŞ) 2001 Related Institution"
- "Turkey General Directorate of Electricity Transmission (TEIAS), Related Institutions"
- "General Directorate of Turkey Electricity Distribution Company (TEDAŞ), Related Institutions"
- "General Directorate of Pipelines and Petrol Transportation Inc. (BOTAŞ), Relevant Institution"
- "General Directorate of Turkey Petroleum Corporation (TPAO), Related Institutions"
- "Turkey Directorate General of Coal Enterprises (TKI), Related Institutions"
- "Turkey Hard Coal Enterprises General Directorate (TTK), Related Institutions"
- "Eti Maden Operations General Directorate (Eti Maden), Relevant Institution"
- "Electromechanical Industry Inc. General Directorate of Turkey (TEMSAN), Related Institutions"

[86]Akalın ve Tüfekçi, 2014, **a.g.k.**, 57.
[87]TÜSİAD, 1998, **a.g.k.**, 246.
[88]https://enerji.gov.tr/ (Erişim Tarihi: 08.03.2021).

- "Turkey Energy, Nuclear and Mining Research Institute (TENMAK), Related Institutions"
- "Energy Market Regulatory Authority (EPDK), Associated Institution"
- "Nuclear Regulatory Authority (NDK), Associated Institution"

The establishment purpose of the Ministry; "To assist in the determination of targets and policies regarding energy and natural resources in line with the security and welfare of the country, the development and strengthening of the national economy; to ensure that energy and natural resources are researched, developed, produced and consumed in accordance with these targets and policies".[89]

The First Five-Year Development Plan, adopted in 1962, was instrumental in the establishment of important organizations in energy. In this development plan, Petro Chemical Industry in Turkey (Petkim) intended to be installed and in this direction under the leadership of TPAO in 1965 with a capital of 250 Million Petrochemical Industry was established.[90] Another important establishment established in this period was İpragaz. İpragaz was established in 1966 as a subsidiary of TPAO to carry out gas distribution duty. Some of the other important developments that took place during this period can be listed as follows:[91]

- 1967 The first pipeline to Dörtyol, Hatay, was put into service,
- İzmir Aliağa Refinery is put into service,
- Establishment of Turkish Engineering Consultancy and Contracting (TÜMAŞ) in 1969 for petroleum investments consultancy services,
- First oil exploration at sea in Iskenderun Bay in 1970,
- Again in 1970, the first natural gas production station Hamitabat went into operation,
- Finding oil in Adıyaman in 1971,
- Opening of the Adıyaman-Sarıl oil pipeline.

The oil crisis that broke out in 1973-77 caused an excessive increase in oil prices. Having a greater share of oil in energy consumption has affected Turkey as well. During this period, against the attitude of the OPEC (oil selling countries organization), Turkey also took place among the founding members of the International Energy Agency of the

[89]TÜSİAD, 1998, **a.g.k.**, 252.
[90]https://tr.wikipedia.org/wiki/petkim (Erişim Tarihi: 09.03.2021)
[91]Akalın ve Tüfekçi, 2014, **a.g.k.**, 57-58.

OECD. After this oil crisis, it was aimed to nationalize the lignite deposits in the private sector by enacting the "Law on Mines to be Operated by the State" in 1978 to plan thermal power plants based on lignite.[92]

Within the scope of the First Five-Year Development Plan, it has been decided to invest 4956 million TL for the establishment of new power plants, energy transmission, and distribution lines and distribution networks in the electricity sector, and for the maintenance and expansion of the old ones. In the investments part of the announced development plan, the investments to be made in line with this plan are specified and the following information about the Hydroelectric Power Plant to be made is given: "1900 million kilowatt hydraulic and thermal power plants will be built on the Euphrates River, including Keban Hydroelectric Power Plant, with a power of 980 million watts and an annual energy production capacity of 4.5 billion kilowatt-hours".[93]

By the year 1970, the Turkey Electricity Authority (TEK) was established to conduct the distribution and sales of electricity generation and transmission. In this period, privileged private electricity partnership policy was abandoned in the electricity sector. However, some privileged partnerships established in the past have protected their existence with the laws of the law. In this period, new policies such as nuclear energy planning and policy, alternative energy resources policy, as well as policies regarding the energy resources currently used, began to take shape. It was the first attempt to build a nuclear power plant during this period, but no credit was found.[94]

1.3.2.4. *1980-2005 period*

Development plans announced as in previous periods play an important role in energy policies. In line with the fourth plan, the main goal is to reduce the oil demand and to meet this demand with domestic production as much as possible. In this fourth development plan, deficiencies and unrealized principles in the third plan period were taken into account. The principles and policies stated in the development plan covering the period of 1979-1983 are as follows:

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[92]TÜSİAD, 1998, **a.g.k.**, 247.
[93]T.C. Resmî Gazete 3 Aralık 1962, Sayı: 11272, s.102-103.
https://www.resmigazete.gov.tr/arsiv/11272.pdf (Erişim Tarihi: 09.03.2021).
[94]TÜSİAD, 1998, **a.g.k.**, 248.

1. “Meeting the energy demand from domestic resources will be the main principle of the energy policy.”
2. “In order to provide timely, stable, and reliable energy required by industrialization and rising living standards, all problems of energy facilities included in investment programs, especially financing, will be solved with priority and urgency.”
3. “Known reserves of national energy resources will be the basis for business management; will be developed and the finding of new reserves will be accelerated within certain programs. Necessary researches will be continued in order to benefit from new energy resources.”
4. “It will be ensured that the known energy resources reach the economic operation conditions connected with their reserves in a way to support the development of the country. Lignite deposits, strategically important for electricity generation and heating and heating, will be operated by the public sector. The use of coking coal for heating - heating purposes will be discontinued.”
5. “Priority will be given to the domestic production of all investment goods used in energy generation, transmission, and distribution and to establish the manufacturing industry in this field.”
6. “Technological developments in energy production and distribution will be closely monitored, adaptation to country conditions will be ensured, and efforts for the transition to nuclear technology will be intensified. First of all, equity will be used in energy production. Care will be taken to improve the thermal/hydraulic balance in the direction of hydraulic production resources.”
7. “Relevant organizations will continue to work in coordination in determining the exact potential of the nuclear energy reserve and developing nuclear technology in order to provide the necessary raw materials to nuclear energy facilities from national sources.”
8. “It will be renewed by taking the previous studies on the preparation of the long-term energy program, the objectives of the Fourth Plan, and the developments in mind.”
9. “Necessary measures will be taken by complying with the principle of saving and rational use at every stage of energy consumption.”
10. “All energy raw materials will be price-matched across the country and they will be sold at the same price level across regions.”
11. “Necessary improvements and regulations will be made in the established laws of TEK and EİE Administration and necessary arrangements will be made for the EİE Administration to become independent energy research and project organization.”
12. “In order to provide electricity to the entire population of the country, the generation of electrical energy and its transmission to the country's surface will be carried out as a public

service in accordance with the TEK law to meet the needs of the whole country. Electricity exchange with countries in the region will be expanded and increased in a balanced way."[95]

Oil exploration activities were encouraged with the law numbered 2808, which was enacted in 1983 and made changes in the existing petroleum law. Various arrangements have been made in favor of the private sector. With this law, companies were given the authority to export 35% on land and 45% on sea for oil production in the oil fields they discovered, exempt from any kind of tax.[96] By the year 1984 between the Soviet Union and Turkey signed an agreement on gas deliveries. Within the scope of this agreement, 25-year natural gas purchase and sale agreement were signed between BOTAŞ and Soyutgazexport in 1986. With law number 2096, also known as the Build-Operate-Transfer (BOT) law, enacted in 1984, Turkey Electricity Authority (TEK) 's monopoly was ended. In this context, the first large-scale project took place 12 years after the law entered into force. Law enacted in 1993 has split the TEK, so that Turkey Electricity Generation-Transmission Corporation (TEAS), and Turkey Electricity Distribution Company (TEDAŞ) was established.[97]

In 1988, TPAO adopted the Joint Venture method by carrying its oil and natural gas exploration activities to the international dimension. This method is a method that allows natural gas and oil activities to be carried out jointly with any country or company and is applied worldwide. In this context, Turkish Petroleum International Company (TPIC) was established in 1988 to provide exploration, drilling, production, transportation, marketing, service and refining services abroad.[98] This company carried out oil exploration activities in Azerbaijan and Kazakhstan in the following years. At the same time, it has worked in partnership with oil and gas companies of countries such as Georgia, Iran, Iraq, Russia, Ukraine, Algeria, Egypt, Sudan, Yemen, Brazil, Kazakhstan, Turkmenistan and Colombia.

As of 1994, total primary energy consumption reached 64.0 million tons of oil equivalent. While foreign dependency on energy is realized at a rate of 49%, the biggest item in imports is the oil with 40%. The installed power of the power plants has reached 20,857 MW and the generation capacity has reached 101 billion kWh, and the demand of

[95]Devlet Planlama Teşkilatı [DPT] (1979). *Dördüncü Beş Yıllık Kalkınma Planı* (1979-1983). s.406-407.
[96]Akalın ve Tüfekçi, 2014, **a.g.k.**, 58-59.
[97]TÜSİAD, 1998, **a.g.k.**, 249-250.
[98]Akalın ve Tüfekçi, 2014, **a.g.k.**, 59-60.

78 billion kWh in 1994 was met without interruption. However, the rapid increase in electricity demand necessitates new investments and continuity of investments in order to meet this demand in the coming years.[99] While addressing the current situation in the Seventh Development Plan of the period, uncertainties and difficulties were also addressed. The recent investments have been insufficient to meet the needs of the growing population and the developing economy, the high rate of loss and illegal use in electricity distribution lines, the lack of a structure where the public and private sector can operate together, the uncertainty about the principles and mechanism of the competition after privatization, and some problems related to the Build-Operate-Transfer (BOT) model have been identified in the development plan. The objectives, policies, and principles for the energy sector are also specified in the plan. The main purpose of energy is to meet the energy needs of society in a continuous and uninterrupted manner and at the same time at a low cost. With the long-term electricity demand studies, it is aimed to give importance to electrical energy investments in a way that can respond uninterruptedly to the energy demand expected to increase rapidly, to start new and large-capacity power plant projects, and to increase distribution and network investments. Issues such as developing domestic energy resources and increasing their share in consumption, initiating necessary projects for the supply of imported resources, and diversifying on a product and source country basis were decided.[100] In addition, focusing on mining investments to produce energy resources, popularizing renewable energy resources and bringing nuclear energy technology to the country in a short time, and ensuring its adaptation are among the prominent issues in this plan.

Liberal regulations on energy markets gained momentum after 2000. Electricity Market Law and Natural Gas Market Law enacted in 2001 are among the important developments that have liberal regulations in energy markets and regulate market operations.[101] The purpose of the Natural Gas Market Law, which was adopted on 18 April 2001, is stated in the first article of the law numbered 4646 as follows: The purpose of the Natural Gas Market Law, which was adopted on 18 April 2001, is stated in the first article of the law numbered 4646 as follows: "It is the liberalization of the natural gas market to create a financially strong, stable and transparent natural gas market and to

[99]Devlet Planlama Teşkilatı [DPT] (1995). *Yedinci Beş Yıllık Kalkınma Planı* (1996-2000). s.136-137.
[100]DPT, 1995, **a.g.k.**, 138.
[101]Akalın ve Tüfekçi, 2014, **a.g.k.**, 61.

ensure an independent regulation and supervision in this market in order to offer natural gas to consumers in a quality, continuous, cheap, competitive manner, in a manner that does not harm the environment".[102] The name of the Electricity Market Regulatory Authority was changed to the Energy Market Regulatory Authority (EPDK) with the Natural Gas Market Law (Law on Amendment of the Electricity Market Law and the Natural Gas Market) published in the Official Journal on May 2, 2001. On the other hand, with the Petroleum Market Law No. 5015, enacted in 2003, the roles of "regulation, direction, supervision, and supervision to regulate the functioning of the markets, to protect the profit-making activities of the private sector, and to ensure that the markets have a transparent, equitable and stable structure" has been given to the state.[103]

When the current conjunctural situation reached in the early 2000s is evaluated, it was clearly stated in the Eighth Five-Year Development Plan of the period that energy was one of the most basic inputs for economic and social development. However, it was emphasized that energy consumption should be saved due to various reasons stated in the plan. In summary, the reasons for saving are: the high cost of energy resources, the high financing and advanced technology required for energy projects and investments, the expectation of an increase in prices, the foreign dependency of energy reaching 62%, the damage caused by energy to the environment during the production and consumption phase make energy saving inevitable.[104] For such reasons, it is important to achieve the highest production and welfare with one unit of energy consumption rather than increasing energy consumption per person.

Private sector investments targeted in the previous development plans were not realized. In particular, only 60-70% of private sector investments envisaged in the sixth and seventh development plans were realized. As a result of the studies carried out, electricity consumption, which was 118.5 billion kWh in 1999, is expected to be 195 billion kWh in 2005 and 285 billion kWh in 2010.[105] It has been stated that public financing opportunities are not sufficient to implement production, transmission and distribution systems to meet this rapid consumption increase, so domestic or foreign private capital should be attracted to the electricity sector. In this context, the necessity of

[102]T.C. Resmî Gazete 2 Mayıs 2001, Sayı: 24390.
https://www.resmigazete.gov.tr/eskiler/2001/05/20010502.htm (Erişim Tarihi: 11.03.2021).
[103]Akalın ve Tüfekçi, 2014, **a.g.k.**, 61.
[104]Devlet Planlama Teşkilatı [DPT] (2000). *Sekizinci Beş Yıllık Kalkınma Planı* (2001-2005). s.142.
[105]DPT, 2000, **a.g.k.**, 143-144.

the private sector is stated in the aims, principles and policies section of the plan as follows:

> - "In the energy sub-sectors, in line with the changing economic conjuncture and increasing privatization activities, it is aimed to transform into a structure in which the private sector can play a more active role. In this direction, necessary legal and institutional changes should be made for the private sector to participate in investment and operating activities at the highest level at every stage from the production to consumption of energy resources, especially in the electricity and natural gas sub-sectors,"
> - "Directing the private sector to energy investments should be ensured not by excessive guarantees, but by a healthy project selection, evaluation, supervision and operation approach. Only in this way will it be possible to attract large and financially strong companies to the sector."[106]

Again, another important issue stated among the aims of this plan is natural gas. Among the aims of the development plan, it was emphasized that the share of natural gas in consumption, which stands out with its advantages in terms of price, efficiency and environment, should be increased. In the restructuring phase of the natural gas sector, the formation of regional gas distribution companies is important as it will ensure the spread of natural gas throughout the country.[107]

1.3.2.5. *2005 and after*

Along with starting full membership negotiations in 2005, it began a new era between Turkey and the European Union. The accession process is accepted as a period of renewal and reform, and the development of economic and social standards has envisaged in this process. Turkey's "energy terminal position" about how important it is in the field of energy is highlighted. Indeed, the strategic importance of Turkey's plans for energy is expressed as follows:

> "Azerbaijan, Turkmenistan, Uzbekistan, and Kazakhstan, which emerged after the collapse of the Soviet Union and have a deep-rooted and common language and historical ties, are countries with rich reserves of energy raw materials. Due to its strategic location for the transportation of oil and gas in the direction of east-west and north-south to international markets, Turkey has the potential of becoming one of the important energy distribution centers."[108]

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[106]DPT, 2000, **a.g.k.**, 144-146.
[107]DPT, 2000, **a.g.k.**, 146.
[108]Devlet Planlama Teşkilatı [DPT] (2006). *Dokuzuncu Kalkınma Planı* (2007-2013). s.10-11.

Since the Ninth Development Plan includes the basic strategies that will contribute to the EU membership process, the plan period was prepared with a delay of 1 year to cover the years 2007-2013, taking into account the EU fiscal calendar. This plan prepared forms the basis of national and regional plans and sectoral and institutional strategies, as well as important documents such as the Pre-Accession Economic Program and the Strategic Framework for Harmonization, which are required for EU membership.[109] In this context, this plan is an important road map for energy policies. In parallel with the liberalization policy, it is planned to reduce the investments of the public sector in the energy sector. The privatization of public generation facilities and distribution system in the electricity sector will take place in line with the strategy document that entered into force in 2004 and the process will be accelerated. Supply security will be ensured by diversifying the sources on the basis of primary energy sources and differentiating the country of origin. In production, it is aimed to increase the share of domestic and renewable energy. Within the scope of privatization, a suitable environment will be allocated for the private sector to replenish the deficit that will arise on time and to start its investments as soon as possible. Storage facilities will be established in order to maintain the adequacy of supply stocks for unexpected situations in oil. In addition, the dissemination of natural gas and the establishment of natural gas storage facilities are among the targets. Hydroelectric power plant projects are aimed to be completed quickly and at the lowest cost. Inclusion of nuclear energy in electricity generation sources in order to provide resource diversity in electricity generation and compliance with the free market in the construction of nuclear power plants are among the other objectives of the plan. By using Turkey's geostrategic position more efficiently, being a transit country between energy producer and consumer countries will strengthen the strategic position. In this context, it is aimed to make Ceyhan one of the important centers in the international oil market and to be effective in gas sales to Europe by completing the construction of natural gas transit pipelines.[110]

Domestic political conjunctural developments in the period when the Ninth Development Plan started to be implemented and the 2008 global economic crisis immediately after has been important factors affecting the economy of Turkey. The uncertainty experienced in the global crisis environment adversely affected the

[109]DPT, 2006, **a.g.k.**, 1-2.
[110]DPT, 2006, **a.g.k.**, 69-70.

expectations for the future, causing investment and consumption to be delayed and consequently a contraction in economies. Turkey has come out of the crisis period with an advantage compared to many countries. This situation experienced after the crisis has led to an increase in capital inflows to Turkey depending on the abundance of liquidity and the environment of trust provided. During the Plan period, demand for energy consumption increased, the problem of supply security continued, and the high increase in oil prices put pressure on the economy in general. Steps were taken to liberalize the electricity and natural gas markets and the share of the private sector in the market was increased. With regard to energy supply security, the promotion of renewable energy production has continued, domestic coal resources have been opened to the private sector for the use of coal in electricity production, studies have been initiated on the construction of nuclear power plants, and regulations have been made to increase energy efficiency. At the same time, in line with mineral exploration activities, lignite coal reserves have increased, many geothermal fields have been discovered and important reserves have been identified in various valuable mines. In addition, TPAO continued its crude oil and natural gas exploration activities, and the exploration data infrastructure continued to be developed throughout the country, especially in the sea area.[111]

Another important development carried out during the Plan period has been signing an agreement for the construction of a 4,800 MW Akkuyu Nuclear Power Plant (NPP) between Turkey and Russia. In addition, an agreement was signed with Japan for the construction of a second 4480 MW nuclear power plant in Sinop. During this period, a bilateral cooperation agreement was signed with the United Arab Emirates (UAE) to generate electricity from the lignite deposits in the Afşin-Elbistan region, the construction of the Tuz Gölü Natural Gas Underground Storage project was initiated, and a bilateral agreement was signed with Azerbaijan for the realization of the Trans-Anatolian Natural Gas Pipeline (TANAP) project. With the Energy Efficiency Law, regulations that encourage and require efficient use of energy have been introduced.[112]

Development Plans were prepared by the State Planning Organization (DPT) from 1960 to 2011. SPO, which closed in 2011, left this task to the newly established Ministry of Development. The Tenth Development Plan covering the period 2014-2018 was prepared by the Ministry of Development. One of the striking aspects of this period has

[111]Kalkınma Bakanlığı [TCKB] (2013). *Onuncu Kalkınma Planı* (2014-2018). s.19-22.
[112]TCKB, 2013, **a.g.k.**, 102-103.

been the expectation of a transformation in the global energy system. In this period, it was observed that the global economic and geostrategic balances in energy production and consumption changed. It is predicted that the USA, which is the world's largest consumer of fossil fuels, will take the lead in oil production and become a net oil exporter before 2020. On the other hand, Iraq was expected to take the second place in oil exports within 20 years. These developments in the world have created an expectation of a change in the global energy balance. This change may have economic and political repercussions worldwide, as well as requiring the development of new policies on energy security at global and regional levels. In addition, it is envisaged that comprehensive programs to increase energy efficiency will be brought to the agenda.[113]

Turkey's oil and gas energy needs are highly met from abroad. While this situation increases foreign dependency on energy, being dependent on a limited country on a resource basis creates a risk factor in terms of energy supply security. Energy imports constitute one-fourth of total imports. In this context, potential developments in the global energy market will be reflected in the Turkish economy. In order to prevent negative reflections, policies to reduce dependence on foreign energy gain importance. In this context, it is important to use domestic resources, especially lignite, more, to use nuclear energy in electricity production and to increase the share of renewable energy sources in energy production.[114] At the same time, the development of electricity trade with neighboring countries, active use of Turkey's geostrategic position for the transportation of oil and gas resources of the Middle East and the Caspian region to Europe will also contribute to Turkey's security of supply.

The main purpose of the Tenth Development Plan in terms of energy is that providing energy to the consumer with continuous, high quality, safe, minimum cost by taking on the diversification of sources as the basis; to achieve a competitive energy system that utilizes domestic and renewable energy resources at the highest possible level, foresees the use of nuclear technology in electricity generation, supports the reduction of the energy density of the economy, minimizes waste and environmental impacts of energy, and strengthens the country's strategic position in international energy trade.[115]

[113]TCKB, 2013, **a.g.k.**, 14.
[114]TCKB, 2013, **a.g.k.**, 15.
[115]TCKB, 2013, **a.g.k.**, 103-104.

The policies envisaged in order to achieve the intended targets regarding energy are as follows:

- "The public sector will play a regulatory and supervisory role. The public sector will only contribute to the healthy functioning of the market as an investor if the markets are insufficient to ensure supply security."
- "The privatization of a significant part of the electricity generation facilities and all distribution assets will be completed."
- "Source diversification and country of origin differentiation will be made on the basis of primary energy resources. In addition, the share of domestic and renewable energy resources in the production system will be increased to the maximum."
- "Investments in electricity transmission, which will remain in the public sector, will be continued in a way to ensure the security of the electricity system."
- "Emergency supply stocks in the oil and natural gas will be created at a sufficient level. Tuz Gölü Natural Gas Underground Storage Project and natural gas storage expansion projects in Thrace will be completed. Natural gas transmission and distribution will be expanded throughout the country and natural gas will be delivered to demand points."
- "The first unit of the Akkuyu Nuclear Power Plant will be completed in the plan period. In addition, the construction of the second Nuclear Power Plant in Sinop will be started. In addition, site determination, pre-feasibility and investment preparations for a third 5000 MW Nuclear Power Plant will be initiated during the plan period."
- "Legal and institutional infrastructure will be strengthened in the field of nuclear energy.
- Policies on issues such as storage, management and disposal of radioactive wastes will be created in a transparent manner."
- "By using highly efficient and environmentally friendly technologies, domestic coal resources will be used by the private sector in electricity generation."
- "Energy Efficiency Strategy will be used effectively. The rehabilitation of thermal and hydroelectric power plants, which are expected to remain in the public sector, will be completed, and the loss-leakage rate in electricity will be minimized."
- "A fast and effective market surveillance and control will be provided in the energy sector."
- "It will be ensured to be a transit and terminal country between energy producer and consumer countries by using Turkey's geostrategic position effectively. Efforts to make Ceyhan an important center in the international petroleum market will continue."
- "It will be played an active role in gas sales and transmission to Europe, and infrastructure will be created to increase the electricity trade capacity with neighboring countries. TANAP project will be completed, full integration with ENTSO-E system will be ensured and high

voltage electricity transmission line projects with other neighboring countries will be completed."[116]

Mineral exploration activities gain importance in reducing the foreign dependency in energy and meeting the raw material needs of the industry. In this context, public investments for energy raw materials and geothermal resource exploration activities have increased. In this way, the allocation allocated to MTA for mining and geothermal resource exploration activities in the period of 2006-2013 was 32 million TL in 2006, but it was increased to 200 million TL in 2013. In the same period, the allowance allocated to TPAO for oil and natural gas exploration activities was 450 million TL in 2006, but it was increased to 1,050 million TL in 2013. A seismic research vessel was purchased in 2012 to increase domestic production in oil and natural gas. At the same time, the construction works of the fully equipped national research ship of MTA continued. Oil and natural gas exploration activities initiated abroad by TPAO and BOTAŞ continued in this period.[117]

A special program has been prepared in this development plan to reduce foreign dependency on energy. With this program prepared under the name of "Energy Generation Program Based on Domestic Resources", it aimed to decrease foreign dependency on energy by increasing the share of domestic resources in energy production. This program, which will be coordinated by the Ministry of Energy and Natural Resources, forms the basis of energy policies in the tenth development plan. In the preparation of this program, the fact that 45% and 62% of the foreign trade deficits in 2011 and 2012 were caused by energy imports was effective. Increasing energy demand causes a continuous increase in energy imports. While this situation causes the continuation of foreign dependency on energy, it puts pressure on the current account balance and energy supply security. This situation containing serious risks for Turkey's economy also negatively affects growth. For stable and high growth, the share of domestic resources in energy production should be increased. In addition, renewable energy sources should also be utilized in order to achieve sustainable development. In this context, the 2018 targets of the program were determined based on these issues. It is aimed to increase the share of domestic resources, which was 28% in primary energy production, to 35% by the end of 2018. Lignite sourced electrical energy production was

[116]TCKB, 2013, **a.g.k.**, 104-105.
[117]TCKB, 2013, **a.g.k.**, 105.

realized as 39 billion kWh in 2012 and the production targeted to be reached by the end of 2018 was determined as 60 billion kWh. In addition, it is aimed to add 10,000 MW to the hydraulic capacity during the plan period.[118]

It involves the development and implementation of a special financing method for utilizing the reserves in the Afşin-Elbistan region for electricity generation from domestic coal resources, which is one of the main components in realizing these goals. R&D studies have also gained importance in order to increase the calorific value of domestic coal and improve its quality. On the other hand, increasing cooperation with foreign countries and companies in line with oil and natural gas exploration, drilling, and production activities and increasing domestic investments to increase domestic production are important for the realization of the targets of the plan. Also, water resources in Turkey pose a potential for electricity generation. In this regard, it is aimed to generate electricity by transforming the water resources that have not been evaluated yet and meet the necessary criteria into investment. Rehabilitation of publicly owned hydroelectric power plants and utilization of renewable resources other than water in electricity generation are important for the realization of the targets.[119]

The energy issue discussed in detail in the development plan is very important to have a sustainable development model for Turkey. In this plan, which is basically based on reducing energy dependence, another program has been prepared in terms of energy. In this program prepared under the name of "Energy Efficiency Improvement Program", the need to use energy efficiently to reduce foreign dependency on energy comes to the fore.

According to International Energy Agency (IEA) and Eurostat data, Turkey is above the OECD and EU-27 averages as one of the "energy-intensive" economies. For a sustainable development model, it is necessary to reduce energy intensity and improve energy efficiency. In this context, the "Energy Efficiency Strategy Document", which entered into force in 2012, guides the work to be done for energy efficiency. With the Energy Efficiency Improvement Program, it is aimed to carry out studies to improve energy efficiency in some selected sectors and areas, to spread existing practices, to increase social awareness by announcing sample applications, and to contribute to the management of energy demand as a result. Turkey's primary energy intensity in 2011

[118]TCKB, 2013, **a.g.k.**, 174-175.
[119]TCKB, 2013, **a.g.k.**, 174-175.

0.2646 toe / $ 1000 worth has been realized. Within this program, it is aimed to decrease below 0.243 TEP / 1000 dollars in 2018. (TEP: Ton Equivalent Oil) Another goal that is aimed to be achieved by 2018 is to reduce the energy consumption in public buildings by 10% compared to 2012. In line with these objectives, it is necessary to develop administrative and institutional capacity for energy efficiency and to develop sustainable financial mechanisms to finance energy efficiency studies and projects. In addition, basic components such as increasing energy efficiency in industry, improving energy efficiency in buildings, increasing energy efficiency in transportation, and spreading of regeneration, cogeneration, and micro-cogeneration systems in electricity generation were determined.[120]

Development plans prepared by the SPO between 1960 and 2011 were prepared by the Ministry of Development in 2013. With the closure of the Ministry of Development in 2018, the newly established Presidency Strategy and Budget Department prepared the development plan covering the 2019-2023 period. In the Tenth Development Plan, the energy issue has been handled comprehensively. The energy profile of the period was clearly stated in the plan and comprehensive policies were developed to take the necessary steps. It will be helpful to examine the data shared in the Tenth and Eleventh Development Plans to observe whether the goals and policies set out in this plan, which aims to reduce foreign dependency on energy and make arrangements for efficient use of energy, are successful.

Table 1. 1. *Developments and Targets in the Energy Sector (2006-2023)*

	2006	2012	2013	2023 (targets)	2018 (Actual)	2023 (targets)
Primary Energy Demand (thousand TOE)	99.642	119.302	123.600	154.000	147.995	174.279
Electricity Energy Demand (GwH)	174.637	241.949	255.000	341.000	303.3	375.8
Primary Energy Consumption per capita (TOE/person)	1,44	1,59	1,62	1,92	1,81	2,01
Per capita Electrical Energy Consumption (kWh/person)	2.517	3.231	3.351	4.241	3.698	4.324
Share of Natural Gas in Electricity Generation (%)	45,8	43,2	43	41	29,85	20,7
Share of Renewable Resources in Electricity Generation (%)	25,3	27	27,7	29	32,5	38,8
Electricity Installed Power	40.565	57.058	58.500	78.000	88.551	109.474

***Note**: TOE: Ton Equivalent Oil, GWh: Gigawatt hours, kWH: kilowatt hour, MW: Megawatt*

***Source:** TCKB, Onuncu Kalkınma Planı & SBB, On Birinci Kalkınma Planı).*

[120]TCKB, 2013, **a.g.k.**, 176-177.

While the primary energy consumption increased by an average of 6.4% annually in the 2014-2017 period, the electrical energy demand increased by an annual average of 3.9% in the 2014-2018 period. In line with the liberalization efforts carried out during the Plan period, the share of the private sector in electricity generation increased to 85%. The share of renewable energy in total electricity production increased compared to 2013 and reached 32.5% in 2018. The share of electricity produced from domestic coal has increased to 14.9 percent. In addition, in the plan period, the equipment used in the production facilities was intended to be produced domestically for the efficient and effective use of renewable energy. Accordingly, tenders have been completed for the establishment of wind and solar Renewable Energy Resource Areas (YEKA) with a capacity of 2000 MW. Construction activities started in 2018 for the Akkuyu Nuclear Power Plant (NGS), the agreement of which was signed during the plan period, and work was carried out for the establishment of new nuclear power plants. In the field of mining, exploration activities for lignite coal continued and the reserves increased to 18.9 billion tons in 2018. During this period, marine natural gas and oil exploration activities have increased, especially in the license areas of the Turkish Republic of Northern Cyprus (TRNC). In addition to the seismic research ship purchased by TPAO in 2012, 2 more drilling ships were added and the work in this field gained speed. In addition, another seismic research vessel, which was started to be built by MTA in 2012, was completed in this period and started its activities. Also in this period, within the framework of the regulation made by MTA, it was allowed to establish a company for exploration and research abroad. With this regulation, it is aimed to establish a global scale and highly competitive mining companies.[121]

While determining the policies in the Eleventh Development Plan, it is aimed to create a sustainable and competitive energy market that takes care of the producer and the consumer in meeting the increasing demand for energy. In this context, it is aimed to create a market infrastructure that will ensure the participation of the demand side while taking cost-based pricing as a basis in electricity and natural gas markets. During the Plan period, Hydroelectric Power Plants (HEPPs) will be rehabilitated and the share of nuclear power plants in electricity generation will be increased. It is envisaged that the construction of the Akkuyu Nuclear Power Plant, the construction of which has started,

[121]Strateji ve Bütçe Başkanlığı [SBB] (2019). *On Birinci Kalkınma Planı* (2019-2023). s.22-23.

will be completed in 2023, and the work will continue for the start of electricity generation and the establishment of 2 additional nuclear power plants. In addition, technology transfer will be provided within the framework of the measures taken to reduce foreign dependency in nuclear power plants. Nuclear Technical Support Corporation will be operational during the plan period in order to provide technical support, analysis, consultancy, audit, training, and certification services that the Nuclear Regulatory Authority may need. On the other hand, It is planned to increase the use of lignite coal which is one of the important reserves Turkey has in electricity generation.[122]

In energy policies, measures such as increasing energy efficiency and increasing forest assets have been taken to reduce carbon emissions, taking into account the protection of the environment. Again in this direction, it is planned to support R&D studies regarding the use of clean coal technologies. It was aimed to increase the capacity to 10 billion cubic meters by completing the construction of natural gas underground storage facilities. Providing a diversity of source country and route in natural gas is important in terms of energy supply security. In this direction, one of the policies developed to ensure supply security will be the completion of FSRU connection systems by procuring the "Floating Storage and Regasification Unit (FSRU)" vessel. The policies developed for renewable energy are aimed to increase the share of renewable energy in electricity generation and to ensure its integration into the grid by increasing investments in renewable energy. Energy efficiency in buildings was taken as a basis and the "National Green Building Certificate System" was developed. In addition, it has been decided to take various measures to reduce technical and non-technical losses in electricity.[123]

Turkey's electricity transmission lines that allow electricity trading with Iran and Georgia and the implementation of the system is important for increasing trade in electricity. Turkey is located between the producers and consumers of energy as its geostrategic location. To be an energy trade center in the region by using this location effectively will increase Turkey's geostrategic importance. It was aimed to complete part of the gas pipeline in Turkey's territorial responsibility in the TurkStream project, one of the important projects in the transportation of Russian natural gas to Europe. The remaining parts of the TANAP, a major natural gas pipeline project passing through Turkey and will carry gas from the Caspian region to Europe, were aimed to be completed

[122]SBB, 2019, **a.g.k.**, 112.
[123]SBB, 2019, **a.g.k.**, 112-113.

as well. One of the other objectives of the plan is to work on the development of the "National Smart Grid Management System (National SCADA)" project to be used in Energy SEEs. Accelerating domestic and overseas exploration activities to meet the oil, natural gas, and geothermal resource needs of the energy sector with local resources is important for Turkey to reduce its dependence on foreign energy. In this context, it was aimed to increase oil and natural gas exploration and drilling activities in the seas, including the maritime license areas of the TRNC, and to conduct 26 offshore drilling activities in total until 2023.[124]

Efforts to increase the share of renewable energy sources in Turkey continue. Within the scope of the YEKA project, one of them, a total capacity of 1,000 MW was provided for the provinces of Aydın, Muğla, Balıkesir, and Çanakkale with the Wind YEKA-2 tender held in 2019. In addition, within the scope of the "National Energy Efficiency Action Plan" prepared for the 2017-2023 period, it is aimed to make an investment of 10.9 billion dollars until the end of the period and to provide 23.9 MTEP beneficiaries in energy consumption. The “Saving Target and Implementation Guide in Public Buildings” published in line with this action plan indicates the necessity of efficient use of energy in all areas.[125]

Turkey meets its need for primary energy resources with a high rate of imports because it does not have rich reserves in terms of fossil fuels except lignite. As of 2018, Turkey, meeting 72% of the energy need in primary energy sources with import, imports mostly natural gas and oil.[126] High external dependency on energy poses a significant supply security risk. In this context, in order to minimize the risk of energy supply security, domestic resources should be used more in energy consumption, and oil and natural gas exploration studies should be carried out with determination. In this context, the Natural gas reserve discovered in the Danube-1 region of the Sakarya field in August of 2020, has opened a new door for Turkey. Following the analysis and engineering studies, it is certain that the natural gas reserve is 405 billion cubic meters, while other exploration and drilling activities in the Mediterranean and Black Sea regions continue.[127] Turkey's foreign dependence on energy, foreign trade deficit, and current account deficit

[124]SBB, 2019, **a.g.k.**, 113-115.

[125]Strateji ve Bütçe Başkanlığı [SBB] (2019). *2020 Yılı Cumhurbaşkanlığı Yıllık Programı*. s.222.

[126]Strateji ve Bütçe Başkanlığı [SBB] (2020). *2021 Yılı Cumhurbaşkanlığı Yıllık Programı*. s.226.

[127]https://www.tccb.gov.tr/haberler/410/122393/-sakarya-sahasinin-tuna-1-bolgesindeki-toplam-dogal-gaz-rezervi-miktari-405-milyar-metrekupu-buldu- (Erişim Tarihi: 18.03.2021)

will be affected in a positive way with the reserves discovered in the Sakarya field and the possible reserves that are likely to be discovered in the Eastern Mediterranean region, and the start of production. On the other hand, Turkey must use the connection path between energy producer and consumer countries effectively and efficiently in accordance with Turkey's geostrategic position. In this context, TANAP, which provides the transmission of Azerbaijani natural gas to Europe, was opened in November 2019, while the TurkStream project, which transports Russian natural gas to Europe, was opened in January 2020.

CHAPTER TWO

2. THE EASTERN MEDITERRANEAN POLICY OF TURKEY AND THE GLOBAL COMPETITION IN EASTERN MEDITERRANEAN

In this part of the study, the developments in the framework of the Eastern Mediterranean importance, exclusive economic zone discussions, discovered energy resources in the region, ongoing exploration, and drilling activities, the effects of the region on the policies of the coastal countries, the global competition in the region and how it shapes Turkey's Eastern Mediterranean policy will be discussed and the possible reflections of the reserves that may be found on the country's economy will be evaluated in line with the energy exploration activities of Turkey in the region.

2.1. Eastern Mediterranean Issue

The Mediterranean is an important region where three continents meet and many countries have coasts. The Mediterranean, which hosted important trade routes in the past, lost its importance due to geographical discoveries, but after the opening of the Suez Canal, it became an important region again. Considering the Mediterranean geography, it is possible to divide it into two regions as east and west. When a straight meridian is drawn from the intersection of Malta Island and Tunisia, the part on the left side of the meridian is defined as the Western Mediterranean, and the part on the right is the Eastern Mediterranean. There are currently a total of 20 countries on the Mediterranean coast. Among these, Spain, France, Italy, Slovenia, Malta, Bosnia-Herzegovina, Albania, Tunisia, Morocco, and Algeria are the countries located on the Western Mediterranean coast. Turkey, Greece, Syria, Lebanon, Israel, Palestine-Gaza Management, Egypt, Libya, Northern Cyprus, and the Greek Administration of Southern Cyprus are countries on the Eastern Mediterranean coast.[128]

Being one of the main routes of the region's energy lines increases the geopolitical and geostrategic importance of the Mediterranean Basin. The energy struggle over the oil and natural gas deposits of the Middle East and North Africa indirectly increases this

[128]U. Kedikli and Ö. Çalağan (2017). *Enerji Alanında Bir Rekabet Sahası Olarak Doğu Akdeniz'in Önemi*. Sosyal Bilimler Metinleri, 2017 (1), s. 122-123.

importance as well.[129] The Eastern Mediterranean has been one of the target points in the colonial races in the past and has always been at the center of the actors who want to dominate the region. Today, the factor shaping the competition in the region is undoubtedly the rich energy resources of the Eastern Mediterranean. This competition directs the policies of not only coastal countries but also countries that want to dominate the region. In this context, while shaping international relations, the region also causes crises and conflicts from time to time. The island of Cyprus, which has almost played a leading role in the developments in the region, is one of the most strategically important points of the region. The European Union, which wants to be active in the region, has taken the political future of the island to a different dimension by accepting the Greek Administration of Southern Cyprus (GASC) as a member without a political solution on the island. Thus, the union has internalized the problems related to the maritime jurisdiction areas of Greece and GASC. Moreover, although there are no borders in the region, the efforts of the USA, England, and Russia to have an active presence in the region are noticeable. In this context, the Eastern Mediterranean and Cyprus issue for Turkey is of great importance in the national interest and national security issues.[130]

2.1.1. Exclusive economic zone discussions

Before explaining the Exclusive Economic Zone (EEZ) concept, it is necessary to explain the concept of the continental shelf. The continental shelf is defined in Article 76 of the United Nations Convention on the Law of the Sea (UNCLOS). The continental shelf of a coastal state includes the seabed and subsoil of submarine areas extending beyond its territorial waters along the natural extension of the land territory to the outer edge of the continental border or is up to 200 nautical miles from the baselines on which the width of the territorial waters where the outer edge of the continental margin does not extend to this distance is measured.[131] The concept of the Exclusive Economic Zone, on the other hand, refers to maritime regions where a state has special rights in exploration and use of marine resources, including water and wind energy. This area extends from

[129]Kedikli ve Çalağan, 2017, **a.g.k.**, 124.
[130]H. Hava (2020). *Doğu Akdeniz'deki Doğal Gaz Rezervlerinin Ekonomik ve Güvenlik Boyutuyla Türkiye Açısından Değerlendirmesi*. Güvenlik Stratejileri Dergisi, 16 (35), 677-678.
[131]United Nations [UN] (1994). United Nations Convention on the Law of the Sea (UNCLOS). s. 53.

the coastline of the state towards the sea to 200 nautical miles out of the sea.[132] However, since the widest distance between the Anatolian shores and the African coasts in the Eastern Mediterranean is under 400 nautical miles, countries need to agree.

The continental shelf is independent of the jurisdiction declaration of the country and is an integral part of the country's natural right. While the continental shelf is the natural right of the coastal country without the need for declaration, the rights arising from EEZ should be declared. While the continental shelf is determined according to the geographical extension of the coastal country in the sea, EEZ grants rights to the coastal state for the exploration and operation of living and non-living resources. So EEZ is more inclusive and gives the coastal state broader rights. The principle of equity is essential when making EEZ agreements between countries. With the regulation made in accordance with UNCLOS, the concept of EEZ has become customary law. According to UNCLOS, EEZ was accepted as a region adjacent to territorial waters and was subject to private law. According to the convention, riparian countries should take into account the rights and obligations of other countries while fulfilling their contractual rights and responsibilities, and the path to be followed should comply with the contract. In case of conflict of interests of riparian countries, conflicts between countries should be resolved in line with the interests of both the international community and the counterparty countries, taking into account the principle of equity and other conditions. According to the contract, countries with adjacent or reciprocal coasts can make a non-violation agreement as stated in the International Court of Justice (ICJ) to determine the limitation of EEZs in accordance with the principle of equity. The riparian country must publish the map showing the EEZ declared and send a copy to the UN secretary-general. According to the criterion of the superiority of the geography, the coastal length of the mainland in the sea area where the EEZ delimitation will be made should be taken into account. Coastal islands can also be effective while limiting. Coastal islands define the islands closest to the mainland of their state. Depending on their location, these islands may not have any effect, or they may change the direction of the coastline according to their location. In this context, the issue of "islands on the opposite side" arises. The opposite islands, according to the IAD, are those that are closer to the mainland of the other country than the country to which they belong. These islands, which disrupt the borders between

[132]https://tr.wikipedia.org/wiki/Münhasır_ekonomik_bölge (Erişim Tarihi: 26.03.2021).

the two countries, are either limited in effect or no right of influence is granted when restrictions are made. In addition, the basic condition for these islands to have a limited impact is the necessity of economic and social life on the island. For example, despite being on the wrong side, Greenland is given full effect due to the existence of economic and social life on the island.[133]

Turkey and Greece are experiencing problems for many years about the continental shelf in the Aegean Sea. After the energy reserves discovered in the Eastern Mediterranean in 2011, this problem was transferred to the Eastern Mediterranean. Because Greece is trying to impose its EEZ by declaring its continental shelf over Meis, Rhodes, Karpathos, and Crete Islands. While Greece closing the South West coast via Meis and Crete, GASC closing Turkey's South East coast unilaterally by acting as holder of the whole island. The GASC declared EEZ in March 2003, ignoring the Turkish community on the island. Having signed an agreement with Egypt in 2003, followed by Lebanon in 2007 and Israel in 2010, the GASC clearly violates the Zurich and London agreements by signing an international agreement without the consent of the guarantor states. GASC, which determined 13 drilling sites in the region after the EEZ agreement signed with Israel, added a different dimension to the discussions in the region.[134]

[133]M. Harunoğulları (2020). *Eastern Mediterranean energy basin: International conflict and competition on the region.* International Journal of Geography and Geography Education (IGGE), 42, s. 458-459.
[134]F. Tuncer ve Z. Altınsoy (2020). *Doğu Akdeniz'de Münhasir Ekonomik Bölge Tartışmaları ve Türkiye'nin Vizyonu*. Akademik Hassasiyetler, 7(13), s 26-28.

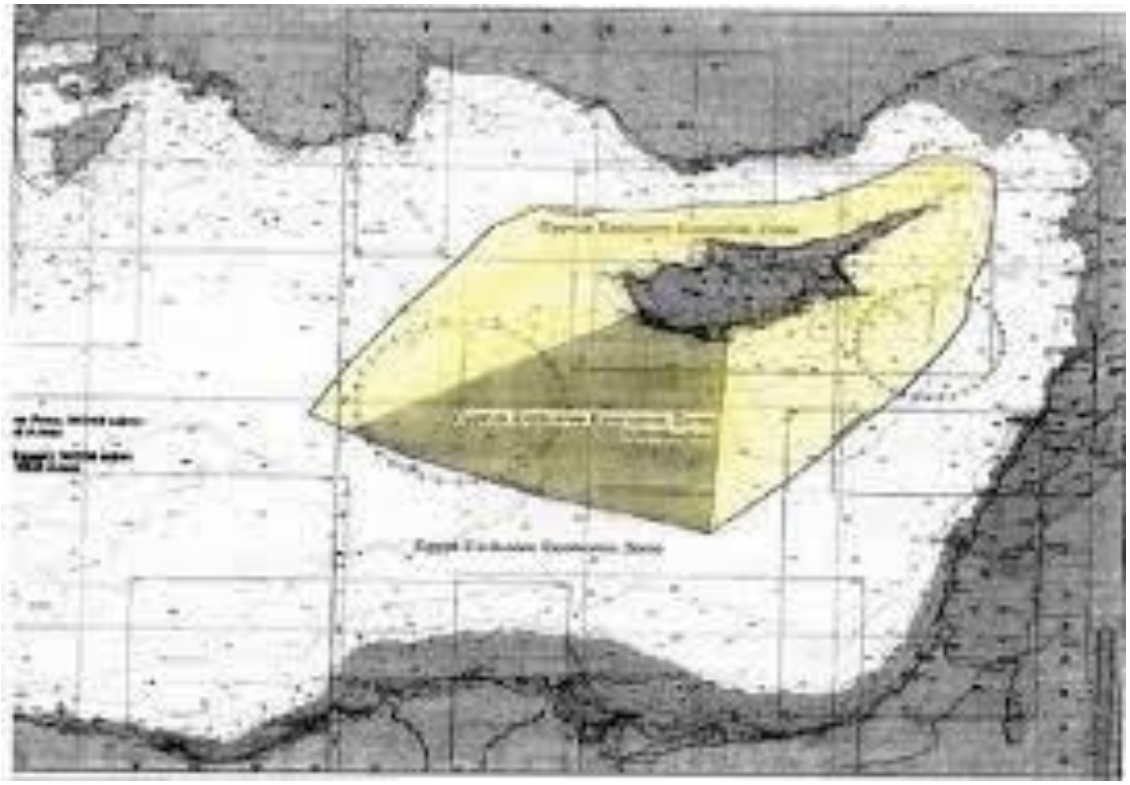

Figure 2. 1. *The EEZ declared by the GASC in 2004*

Source: *Dr. Cihat Yaycı (2012). Doğu Akdeniz'de Deniz Yetki Alanlarının Paylaşılması Sorunu ve Türkiye.*

The license areas declared in Turkey coincides with a portion of the license area declared by the GASC. Turkey has declared that GASC does not have the authority to make continental shelf and EEZ delimitation agreements for all of Cyprus. Turkey, indicating that these agreements violate international law, has declared that the agreement was invalid. For this reason, Turkey does not recognize the agreement between the GASC and Egypt. Turkey gave a note stating that it reserves the rights in the said field and reported this to the UN Secretary General. Agreement between the GASC and Lebanon on the EEZ delimitation based on the middle line principle, has not been approved by the Lebanese government as a result of Turkey's efforts. On the other hand, Syria does not have any EEZ restriction agreement in the region. Egypt signed an EEZ delimitation agreement with Southern Cyprus and Lebanon on the basis of the middle line. On the other hand, Egypt's agreement with Israel in 2010 was not approved by the Lebanese Parliament due to the dispute between Lebanon and Israel on delimitation.[135]

[135]N. J. Ece (2017). *Doğu Akdeniz'de Münhasır Ekonomik Bölge: Sınırlandırma Anlaşmaları, Paydaşlar ve Stratejiler*. JEMS Maritime Sci, 5(1), s. 87-88.

On the other hand, Greece's plan is to limit the maritime jurisdiction based on the midline based on the Crete, Kashot, Kerpe, Rhodes and Meis line. Based on the middle lines with the Greek Cypriot Administration, Greece aims to limit Turkey in the Eastern Mediterranean only with the Gulf of Antalya. This attitude is incompatible with international legal norms. In this way, the islands in question have the status of "islands on the opposite side" according to the middle line, and they cannot form a coast in the delimitation of the EEZ, nor can they have a continental shelf outside of their territorial waters. This situation is clearly understood from international judicial and arbitration decisions. Some of these judicial decisions are as follows;

- "North Sea cases decision: geography reshaping is out of the question,"
- "UK v. France judgment: geographical circumstances determine the appropriateness of equal distance or any other method of restriction"
- "Libya-Malta case decision: the sides of the parties form the starting line,"
- "Tunisia-Libya case decision: the continent dominates the sea."

As can be understood from these decisions, the principle of "superiority of geography" comes to the fore in these cases that are decided.[136]

The Eastern Mediterranean has come to the fore with the discovery of rich underground reserves and the reserve potential since the early 2000s. Following these developments in the Mediterranean region, some countries have determined their maritime jurisdiction areas by making an agreement. In this context, issues such as determination of jurisdictions and exploration-production license areas have brought problems between countries. At the basis of these problems are the decisions taken without a full agreement with unilateral or bilateral agreements in determining the Exclusive Economic Zone (EEZ) areas. The overlapping of the determined maritime jurisdictions without a full agreement and the exploration licenses issued accordingly cause problems in the region.[137] According to UNCLOS, the determination of the EEZ is made by "announcement" or "agreement". In the convention, it is stated that the restriction of the EEZ between the countries with coasts or adjacent coasts should be in accordance with the principle of equity. In this context, an agreement between all parties involved is necessary for equity. However, all riparian states in the Eastern Mediterranean prefer

[136]C. Yaycı (2012). *Doğu Akdeniz'de Yetki Alanlarının Paylaşılması Sorunu Ve Türkiye*. Bilge Strateji, 4 (6), s. 19-21.
[137]Hava, 2020, **a.g.k.**, 678.

unilateral declaration or bilateral agreements instead of making agreements between them.

2.1.2. Turkey's rights arising from international maritime law

The continental shelf that Turkey should have in the Eastern Mediterranean region and the EEZ have been the subject of many studies. While these studies evaluate the EEZ claims of riparian countries, the maps that should be according to UNCLOS are also drawn. The map, which is one of these maps and announced by the Turkish Petroleum Corporation (TPAO) as license zones, is as follows.

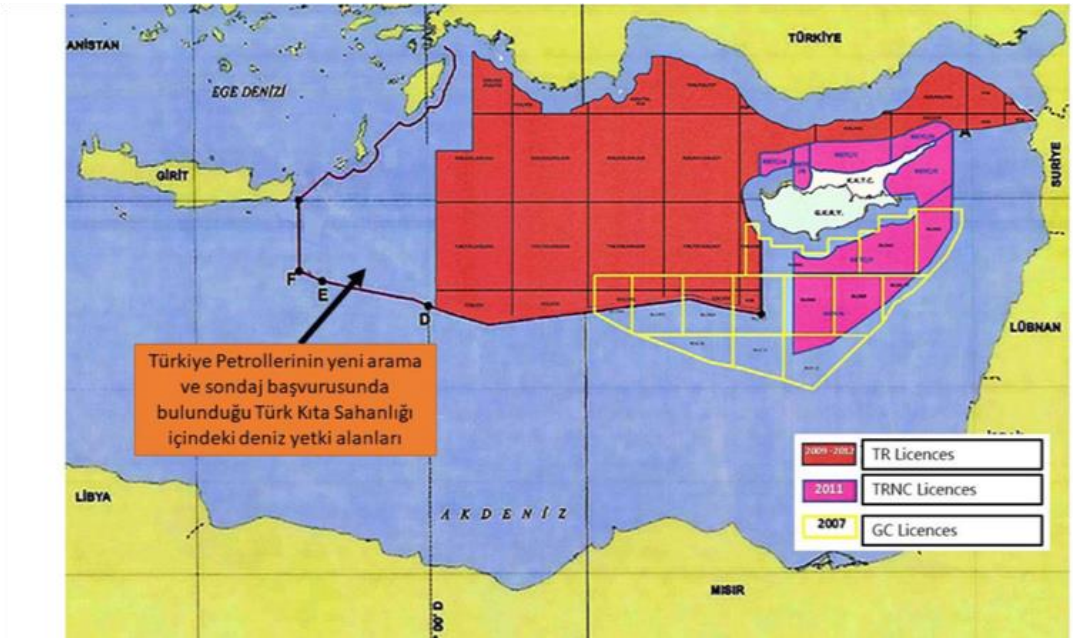

Figure 2. 2. *TPAO License Fields*

Source: Anadolu Ajansı (2020). "Dışişleri Bakanlığı, Doğu Akdeniz'de yeni ruhsat başvurusu yapılan sahaların yerini gösteren haritayı paylaştı"

As seen on the map, the MEB area announced unilaterally by the GASC coincides with the TPAO license areas. According to this map, the right to enclave (to be limited to land waters) has been given for the islands of Greece on the Turkish side. Also, contrary to the theses of GASC and Greece, Turkey and Egypt are seen as riparian countries in this map. Greece aims to limit Turkey's maritime jurisdiction over Meis. However, these efforts seem to be incompatible with the previous decisions of the International Court of Justice. Thus, the cases of St. Pierre and Miquel Islands between Canada and France and

Serpent Island between Romania and Ukraine reveal that Turkey is justified on this issue.[138] These decisions show that Greece cannot limit Turkey through the island of Meis and that these islands have only the right to encroachment.

Turkey does not take into account the so-called MoNE restriction map announced by the GASC. So much so that the drilling ship Saipem 12000, owned by the ENI firm licensed by the Greek Cypriot Administration, tried to enter the disputed area for which the GASC was licensed, but was stopped by the warships of the Turkish Naval Forces. While the incident in question attracted reactions in the international arena, Turkey decisively reiterated that it will not compromise its maritime jurisdictions by announcing NAVTEX in the region after this incident. On the other hand, GASC is in an effort to find support in the international arena by authorizing energy companies of various countries to search and drill in the licensed regions it has declared. The Republic of Turkey has clearly warned these countries not to be a party to the conflict.[139]

In the studies conducted, based on UNCLOS, the depiction of Turkey and the TRNC's riparian countries in the Eastern Mediterranean and their mutual coasts were drawn. Since the principles of equity and the superiority of geography are observed in these maps, it is seen that Egypt, Israel, Lebanon and Syria have more maritime jurisdiction if they make delimitation agreements with TRNC instead of GASC. According to the International Law of the Sea, the limitation of maritime jurisdictions should be made by taking into account the proportion of the coastal lengths of the states, in a way that does not obstruct the mainland and whether they are in the opposite direction. In this context, it is essential that the islands cannot have as much maritime jurisdiction as the mainland.[140] This situation is clearly understood as a result of the previous decisions of international courts. The map that emerges when the TRNC makes a delimitation agreement with Egypt, Israel, Lebanon and Syria is as follows.

[138]Tuncer ve Altınsoy, 2020, **a.g.k.**, 29-30.

[139]Ö. L. Taşçıoğlu (2018). *GKRY'nin Türkiye Cumhuriyeti'ne Ve Kuzey Kıbrıs Türk Cumhuriyeti'ne Ait Deniz Yetki Alanlarindaki Petrol Ve Doğal Gaz Arama Çalışmaları Ve Münhasır Ekonomik Bölge Anlaşmaları.* International Social Sciences Studies Journal, 4(26), s. 5702-5703

[140]Yaycı, 2012, **a.g.k.**, 41-43.

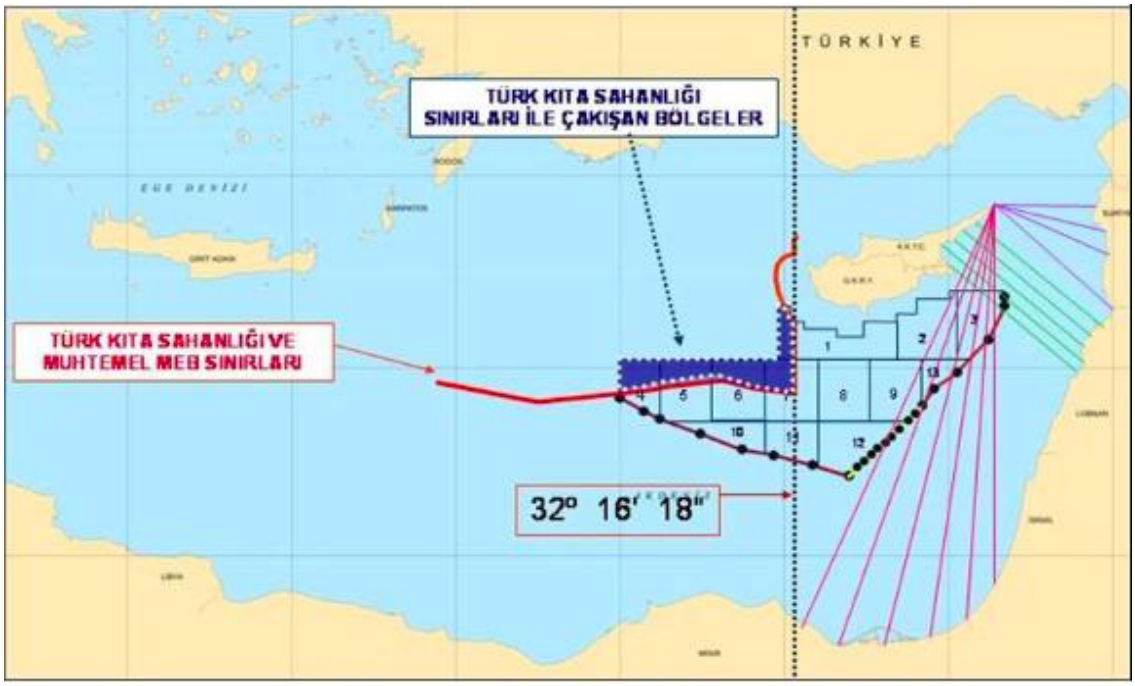

Figure 2. 3. *Possible EEZ restriction line that TRNC can declare*

Source: Dr. Cihat Yaycı (2012). Doğu Akdeniz'de Deniz Yetki Alanlarının Paylaşılması Sorunu ve Türkiye.

Turkey benefits from its maritime jurisdictions within the framework of the powers granted by the principles of international maritime law. In this context, the maritime area, also known as the Blue Homeland, covers the jurisdictions of Turkey. Turkey, together with Anatolia and Rumelia, has a total of 8,333 km of coastline and a maritime jurisdiction of approximately 462 thousand square kilometers in all the Eastern Mediterranean, Aegean (Islands), Marmara and Black Sea regions. Among these areas, the Black Sea is based on the EEZ announced in 1986, the Aegean Sea is based on the middle line based on the mainland of Greece-Turkey, the western border in the Eastern Mediterranean is based on the EEZ agreement with Libya, and other borders are based on the borders determined as if an agreement was made with Egypt, Lebanon, Israel and Syria.[141] The map drawn according to the Blue Homeland doctrine in the map below shows Turkey's maritime jurisdiction areas.

[141]Yaycı, C. (2020). *Türkiye Bir an Önce Doğu Akdeniz'de MEB İlan Etmeli.* Sputnik News.

Figure 2. 4. *Maritime Jurisdiction According to Turkish Blue Homeland Doctrine*

Source: Dr. Cihat Yaycı (2020). *Türkiye Bir an Önce Doğu Akdeniz'de MEB İlan Etmeli.*

The Aegean Sea, where there are many islands and rocks, has a special situation. The continental shelf of the Aegean Sea is based on the Lausanne Treaty signed in 1923. According to this map, Turkey has a maritime jurisdiction area of 89.392 square kilometers in the Aegean Sea. Greece violates the 3-mile territorial water rule of the Treaty of Lausanne in the region, including islands, islets and cliffs whose sovereignty has not been transferred to Greece by treaties, and islands that are armed and deployed even though they must be demilitarized. Based on the middle line dividing the countries with mutual coasts, the islands located on the opposite side of the middle line are considered as natural extensions of the state close to the coast due to the principle of immutability of geography. When examining the case law of the International Court of Justice and Permanent Arbitration Courts, according to the "principle of proportionality" and the principle of "non-encroachment on the territory of another state" applied under the principles of fair and equitable sharing, the maritime jurisdiction areas of the islands

on the opposite side of the middle line should be calculated only as much as their territorial waters.[142]

Figure 2. 5. *Aegean Sea Continental Shelf Based on Lausanne Treaty*

Source: Dr. Cihat Yaycı (2020). *Türkiye Bir an Önce Doğu Akdeniz'de MEB İlan Etmeli.*

The western border of Turkey in the Eastern Mediterranean became clear after the agreement it signed with Libya. The agreement signed between the Republic of Turkey and the Libyan Government of National Consensus on 27 November 2019 has also been registered by the United Nations. One of the agreements signed with two agreements was recorded as "restriction of maritime jurisdiction areas" and the other as "security and military cooperation" memorandum. With this agreement in which maritime jurisdictions were determined, Turkey notified the drilling areas in the region to the UN. With this agreement signed with Libya, Turkey has prepared a legal and legitimate ground in the Mediterranean by signing an EEZ delimitation agreement with a riparian state in the Mediterranean for the first time. As a result of this agreement, Greece has been blocked from making delimitation agreements with Egypt and GASC. In the agreement between the two countries, the coordinates for the "middle line" border were determined and the

[142] Yaycı, 2020, **a.g.k.**

borders of the mutual coasts were determined. According to the agreement, countries will be able to cooperate if the two countries have natural resources starting in one EEZ area and extending to the other. In addition, if one of the two countries negotiates with a third country about the EEZ delimitation agreement, it has been decided to conduct mutual information and negotiations before the said country makes a final agreement.[143]

2.2. Eastern Mediterranean Energy Resources

The geopolitical and geostrategic importance of the Eastern Mediterranean region is based on its rich underground resources. Especially the reserves discovered in terms of energy resources have increased the importance of the region in the recent period. Thus, the issue of sharing the reserves discovered in the region has brought the maritime jurisdiction areas to the agenda. In this context, the energy resources discovered in the region are also important for evaluating the energy policies of Turkey and other riparian countries. In this part of the study, information about the reserves discovered in the Eastern Mediterranean and ongoing exploration and drilling works will be given.

4 important energy fields have emerged in energy exploration studies in the Eastern Mediterranean. The area in the south of the island of Cyprus is Aphrodite, the region between the island of Cyprus and Israel is Leviathan, the area between the island of Cyprus and Egypt is the Nile, the region between the island of Cyprus and the southeast of the island of Crete is defined as Herodotus. These regions can also be seen on the map below.

[143]Harunoğulları, 2020, **a.g.k.**, 474-475.

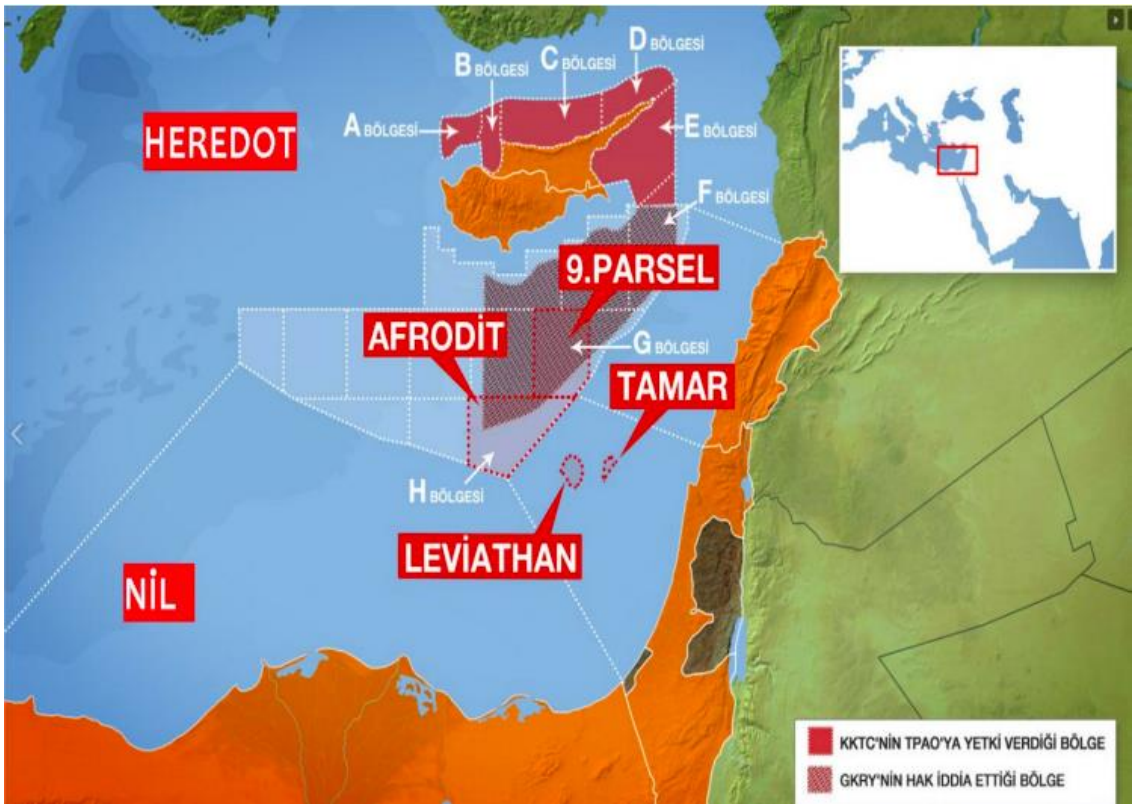

Figure 2. 6. *Eastern Mediterranean Energy Basins*

Source: U. Kedikli ve Ö. Çalağan (2017). *Enerji Alanında Bir Rekabet Sahası Olarak Doğu Akdeniz'in Önemi.*

The first important discovery in the Eastern Mediterranean region was made in the Nile Delta of Egypt in the 1980s. Since the early 1990s, important international oil companies such as British Petroleum, ENI and British Gas have increased their investments in the region. In time, with the effect of the developments in seismic exploration and drilling technologies, it has been understood that there is a significant amount of oil and natural gas reserves in the region. With these discoveries, the importance of the region has increased, but the important discoveries in the Tamar region of Israel in 2009, the Leviathan region in 2010 and then the Zohr field of Egypt have been the most important developments that have recently increased the importance of the region. Approximately 2.24 trillion cubic meters of natural gas has been found in the fields discovered in the last 10 years in the Eastern Mediterranean. The most important known reserves stand out as 623 billion cubic meters in the Leviathan region and 850 billion cubic meters in the Zohr region.[144] Zohr region of Egypt, estimated to have 850

[144]Harunoğulları, 2020, **a.g.k.**, 461.

billion cubic meters of reserves, has the largest reserve ever discovered. One of the discoveries made in the recent past was realized in the EEZ region, which was declared unilaterally by the GASC. Natural gas reserves between 169 and 226 billion cubic meters were discovered in the Calypso (6th Parcel) field in 2018 and 142 to 227 billion cubic meters in the Glaucus-1 (Parcel 10) field in 2019.[145] Reserve amounts of natural gas fields discovered in the Eastern Mediterranean region are shown in detail in Table 2.

Table 2. 1. *Natural Gas Reserves Discovered in the Eastern Mediterranean.*

Countries	Year Discovered	Natural Gas Field	Reserve Amount (billion cubic meters)	Production Year (Started or planned)
Israel	1999	Noa	1,4	2012
	2000	Mari-B	25	2004
	2009	Dalit	14,1	2013
	2009	Tamar	283	2013
	2010	Leviathan	509	2019
	2011	Dolphin	2,2	2019
	2012	Shimshon	8,4	-
	2012	Tanin	33,9	2020
	2013	Kariş	50,9	2020
Palestine	2000	Gazze Marine	28,3	2017
GASC	2011	Aphrodite	198	2019
	2018	Calypso	169-226	-
	2019	Glaucus-1	142-227	-
Egypt	2015	Nooros	19,8	2016
	2015	West Nile Basin	140	2017
	2015	Zohr	850	2017
	2015	Atoll	42,5	2018

Source: *H. Hava (2020). Doğu Akdeniz'deki Doğal Gaz Rezervlerinin Ekonomik ve Güvenlik Boyutuyla Türkiye Açısından Değerlendirmesi.*

According to the report published by the US Geological Research Center (USGS), it is estimated that there are 122 trillion cubic feet (approximately 3.45 trillion cubic meters) of natural gas and 1.68 billion barrels of oil in the Leviathan basin.[146] In addition, in another study conducted by USGS, unexplored oil and natural gas reserves in the Nile Delta basin were evaluated. According to the evaluations made, it is estimated that there are 1.7 billion barrels of oil, 223 trillion cubic feet (approximately 6.32 trillion cubic

[145]Hava, 2020, **a.g.k.**, 689-690.
[146]C.J. Schenk vd., (2010). *Assessment of undiscovered oil and gas resources of the Levant Basin Province, Eastern Mediterranean.* U.S. Geological Survey Fact Sheet 2010-3014, s. 2-3.

meters) natural gas and 5.9 billion barrels of liquid natural gas in the basin of the Nile.[147] With these unexplored and thought to exist reserves and the significant amounts of reserves discovered, the importance of the region is increasing day by day. The fact that countries that do not have a coast on the Eastern Mediterranean also conduct research in this region is an important indicator that they want to dominate the region. On the other hand, as a result of the exploration works carried out by the Norwegian oil exploration company PGS in the western and southern parts of the island of Cyprus, it is estimated that there are 8 billion barrels of oil (approximately 400 billion dollars) reserves in the region.[148] In addition, evaluations have been made regarding the energy reserves in the energy basin called Heredot, most of which is located in Turkey's EEZ. In this context, it is estimated that there are 3.5 trillion cubic meters of undiscovered natural gas reserves in the Heredot region. When the hydrocarbon deposits, whose value is thought to be equivalent to approximately 1.5 trillion dollars and 30 billion barrels of oil, are calculated with the consumption data of 2010, it is estimated that Turkey can meet the natural gas need of approximately 572 years.[149]

The Eastern Mediterranean is already of great importance due to its position in energy transfer. Considering the increase in economic potential with the discovered energy reserves and the ongoing exploration and drilling works, it is understood that the region will become an energy center and increase its importance. The discoveries made in the region direct the competition of coastal countries, as well as closely related to European countries that do not have a coast in the Eastern Mediterranean and are mainly dependent on Russia. In this context, there are different alternatives for transporting the energy reserves in the region to Europe. One of these alternatives is the transmission of energy flow to Europe via a pipeline between the Southern Cyprus and Greece. However, due to the large distance, this alternative is in the background compared to other alternatives. Another alternative is to transport energy via the Arab Gas Pipeline through Israel, which seems unlikely due to security problems in the region. The third alternative is to transport natural gas to Europe via Turkey. This alternative is the most rational alternative both in terms of distance, in terms of economy and security. However, due to

[147]M.A. Kirschbaum vd., (2010). *Assessment of undiscovered oil and gas resources of the Nile Delta Basin Province, Eastern Mediterranean*. U.S. Geological Survey Fact Sheet 2010-3027, s. 2-3.
[148]B.S. Dilek (2008). *Akdeniz'de Sanal Petrol Oyunu.*TMMOB Elektrik Mühendisleri Odası.
[149]M. Ertürk (2017). *Doğu Akdeniz'de Türk-Yunan Enerji Uyuşmazlığı*. Journal of Current Researches on Social Sciences, 7(2), s. 16.

political reasons, instead of this alternative, an agreement was made between Israel, Greece and the Greek Cypriot Administration for a project. With the East Med Pipeline Agreement signed on January 2, 2020, natural gas is planned to be transported by the pipeline to be passed through the GCA-Crete-Peloponnese-Italy route. With this project, which is expected to cost between 6 and 15 billion dollars, it is estimated that 12 billion cubic meters of natural gas will be transported annually.[150]

2.3. Eastern Mediterranean Policy of the Countries in the Region

Examining the strategies of the coastal countries in the region will be useful for better understanding Turkey's Eastern Mediterranean policy. In this context, in this part of the study, 9 countries including Turkey and the policies and strategies of GASC are discussed.

2.3.1. Israel

With the energy fields discovered since 1999, Israel has reduced its energy imports over time. Until this period, Israel, which met its oil and natural gas needs from Egypt, started to need less imported energy resources with these discoveries. According to the Energy Strategy Documents prepared by the Israeli Ministry of Energy for the years 2030 and 2040, it is Israel's strategic goal to meet domestic consumption with the energy resources discovered in the short term and to export this energy to the countries in the region in the medium term and to European countries in the long term. Within the framework of this target, the way has been opened to ensure the electricity production of the country with natural gas. So much so that Israel plans to gradually increase the rate of energy it obtains from electricity until 2030. One of the main strategies that Israel pursues in the region is to obtain foreign currency income by exporting new energy resources and to reduce foreign dependency in energy. In this context, Israel, acting together with Greece and the GASC, carries out policies directly against Palestine and Lebanon and indirectly against Turkey. Energy cooperation between the EU and Israel has come to the fore regarding the export of energy resources in the region, and in this direction, the EastMed project, to which the EU pledged financial support in 2015, came to the fore.[151]

[150]Hava, 2020, **a.g.k.**, 688-689.
[151]D. İstikbal ve H. Boyraz (2019). *Doğu Akdeniz Enerji Kaynaklarına Ekonomi-Politik Bir Yaklaşım*. Kıbrıs Araştırmaları ve İncelemeleri Dergisi, 3(5), 75-76.

With the EastMed Pipeline Agreement signed on January 2, 2020, natural gas is planned to be transported by the pipeline to be passed through the GCA-Crete-Peloponnese-Italy route. (See Figure 2.3)

Figure 2. 7. *EastMed Pipeline*

Source: TRT Haber

2.3.2. Palestine

British Gas, which acquired the license to conduct exploration in the Tamar region in 1999, also invested in Gaza and gas discoveries were made in the Gaza Strip offshore. The Palestinian Authority initially prepared a four-year plan for the development of the region. However, fearing that Hamas will strengthen its relations with Egypt with the energy revenues in the region, Israel objected to the developments in Palestine. In the process that started in 1999 with the discovery of approximately 1.4 billion cubic meters of natural gas reserves in the Noa gas field at commercial and operable levels, various incidents took place between Israel and Palestine. This process continued with the "Operation Cast Lead" attack carried out by Israel in Palestine in Gaza in 2008-2009. It is estimated that there are approximately 38 billion cubic meters of natural gas in the Gaza Strip and territorial waters, where Israel operates. In this context, it has been evaluated that the Protection Line Operations organized by Israel may actually be "power line operations".[152]

[152]Harunoğulları, 2020, **a.g.k.**, 470-471.

2.3.3. Lebanon

Exploration studies of Lebanon in the region date back to 1993. Lebanon, which carries out both two-dimensional and three-dimensional exploration studies in the region, has carried out two-dimensional exploration studies in all of its territorial waters and three-dimensional exploration studies in seventy percent. Lebanon supports its activities in the region with various policies. Some of these are the "Offshore Petroleum Resources Law" approved by the parliament in 2010 and the "Strategic Environmental Assessment (SEA)" for the offshore oil sector prepared in 2012. According to the evaluations of Spectrum, which conducts exploration studies in the region, Lebanon's natural gas reserves are deeper and better than those of Israel and Cyprus. According to the evaluations made, it is estimated that there are 95.5 trillion cubic feet (2.7 trillion cubic meters) natural gas and 865 million barrels of oil reserves in the region. Lebanon divided the maritime jurisdiction in the region into blocks. The US Bureau of Energy Resources stated the energy fields in the Eastern Mediterranean and the blocks determined by Lebanon as shown in Figure 2.4. As one of these, Block 9, is in a disputed position between Israel and Lebanon, it is one of the challenges Lebanon must overcome in energy developments. Other challenges facing Lebanon are as follows; complexity in domestic policy, lack of necessary infrastructure and good business environment, and financial and technical deficiencies. [153]

[153]Harunoğulları, 2020, **a.g.k.**, 473.

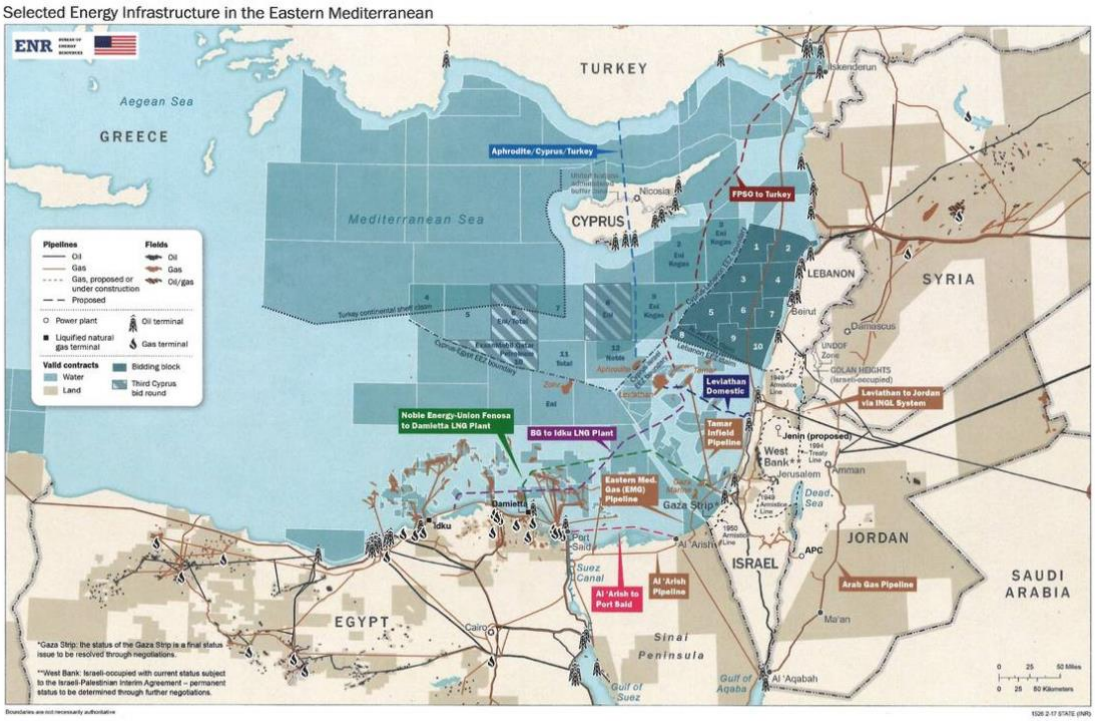

Figure 2. 8. *Selected Energy Infrastructure in the Eastern Mediterranean*

Source: U.S. Bureau Of Energy Resources (ENR)

While the difficulties and low growth trend in the Lebanese economy make it difficult to extract energy resources, it leads Lebanon to cooperate with international energy companies. The Israeli government reacted that Lebanon signed a contract with the partnership of French Total, Italian ENI and Russian Novatek for drilling works in blocks 4 and 9 in 2017. As mentioned before, block 9, which is considered as a disputed area between the two countries, is accepted by Israel within its own EEZ boundaries. So much so that Israel defined this development as a "act of provocation".[154] The failure of Lebanon to officially recognize the state of Israel makes a solution between countries impossible. Following these developments, Lebanon's announcement that it is ready to determine the maritime borders with Israel in 2019 is important in terms of melting the ice between the two countries. The fact that Lebanon signed a memorandum on energy and some other issues in the same year shows that it wants to develop bilateral relations in the region.

One of the hottest developments in the recent period is the Lebanese and Israeli delegations gathered under the auspices of the UN and discussed the disputed region in

[154]İstikbal ve Boyraz, 2019, **a.g.k.**, 77-78.

question. The USA mediated the talks. With a joint statement published, it was reported that the negotiations were fruitful and the parties would continue the negotiations. These meetings are of historical importance in that they are the first civilian meeting of the two parties in 30 years. However, it was emphasized that these talks were only about the disputed area on the sea border and 13 points on the land border, which is the disputed area between the two countries, were not discussed.[155]

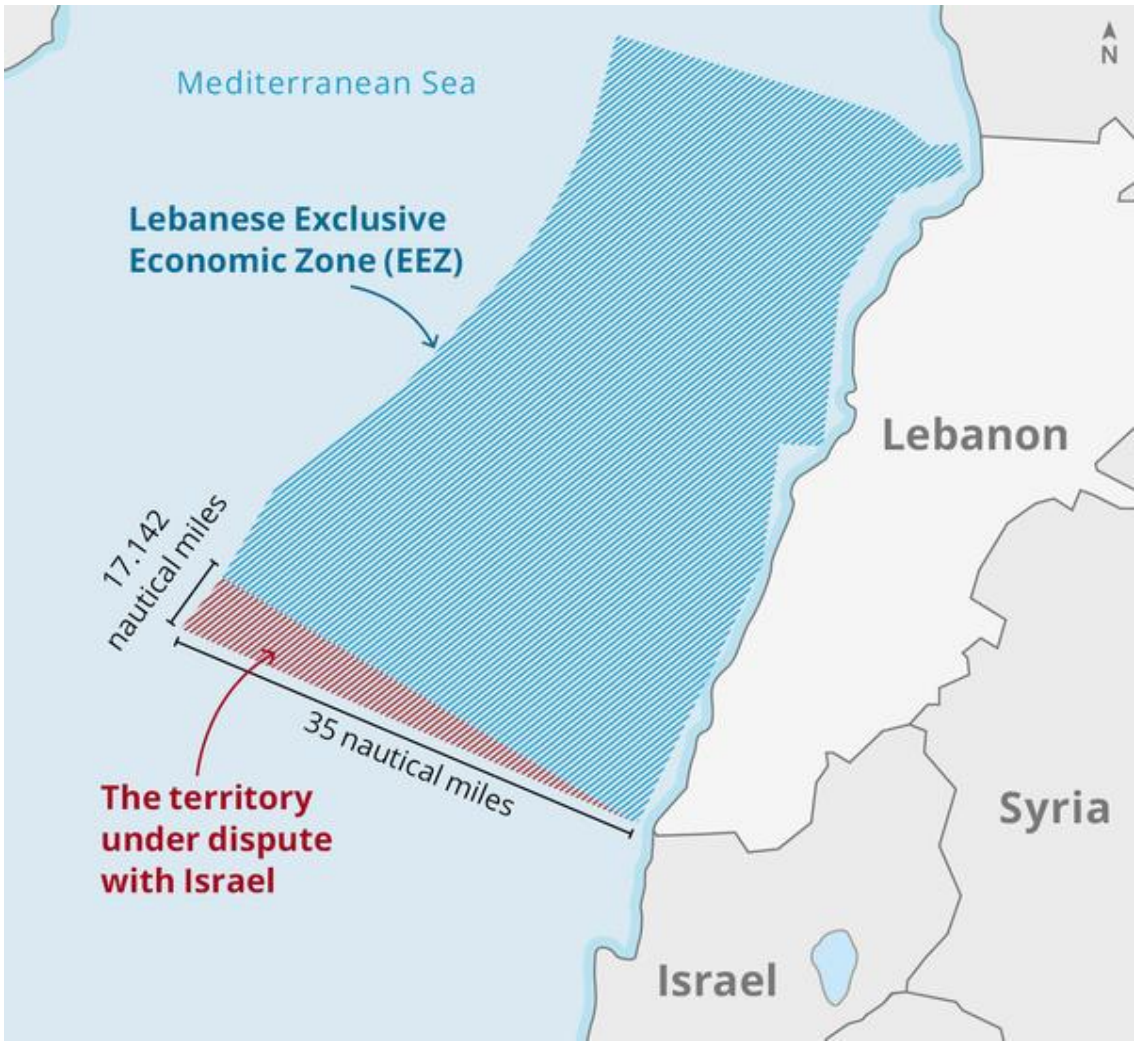

Figure 2. 9. *The Territory Under Dispute Between Lebanon and Israel*

Source: Haaretz.com

[155]N. Landau, J. Khoury and Reuters (2020). *Israel, Lebanon Begin U.S.-mediated Talks Over Disputed Maritime Border*. Haaretz Newspaper.

2.3.4. Syria

Syria has been included in the energy equation in the region with the law "Determining the National Sovereignty in the Territorial Waters of Syria", which it approved in 2003. In this law, matters regarding the territorial waters, inland waters, adjacent region, continental shelf and exclusive economic zone of the country are regulated. Syria has notified the maritime jurisdiction limits regarding the exclusive economic zone to the UN. Later, Syria started exploration and reconnaissance activities in the EEZ that it designated. CCG Veritas completed two-dimensional seismic surveys in 2005. In 2011, as a result of the evaluations made in Syria's energy fields, it was estimated that there were 240 billion cubic meters of natural gas and 2.5 billion barrels of oil reserves in the region. In 2011, Syria announced that it would receive offers from companies to search in 3 blocks it determined in maritime jurisdictions. However, the civil war that started in Syria in 2011 also damaged the energy sector and prevented the developments in energy. However, in 2013, the Syrian government signed an agreement with the Russian energy company Soyuz Nefte Gas to conduct hydrocarbon exploration.[156] Considering the ongoing war in the country and the international relations of the current regime, Syria's Eastern Mediterranean policy remains uncertain.

2.3.5. Egypt

Egypt was the first country in the region by creating an EEZ in the Eastern Mediterranean in 1983. Since the 1990s, some important international energy companies have increased their investments in the Egyptian sea area. While domestic production and consumption increased after the gas discoveries in 1997, Egypt started to export gas in 2003. Egypt, which exports gas to countries such as Jordan, Syria, Israel and Lebanon, could not offer new hydrocarbon exploration until 2013 due to political reasons. Egypt, which has given many exploration and production concessions since 2013, finally made important energy field discoveries in 2015. The Zohr region, which is the most important of these, was estimated to have natural gas reserves in the range of 651 to 736 billion cubic meters according to preliminary determinations. According to the latest data, it is

[156]Harunoğulları, 2020, **a.g.k.**, 473-474.

estimated that there are 850 billion cubic meters of natural gas reserves in the region. In addition, Egypt stands out with its pipelines and LNG export infrastructure.[157]

In line with the 2030 Energy Strategy Targets prepared by the Egyptian Ministry of Electricity and Energy, the energy reserve in the Zohr region can meet the domestic consumption, it is likely to contribute to the country's economy by exporting to abroad, and also contributes to the energy supply security. The recent increase in the exchange rate in the Egyptian economy, hikes in the domestic market, high inflation and interest rates make it necessary for the energy resources discovered in the Eastern Mediterranean to turn into export items and generate foreign currency income. Acting together with GASC and Greece in the Eastern Mediterranean policies, Egypt, like Israel, aims to re-establish its relations with the West and export natural gas to Europe. Greece and the Greek Cypriot Administration intend to establish an alliance against Turkey by cooperating with Egypt, which has critical importance in the region, in line with political purposes. In the context of this cooperation between Egypt, Greece and the Greek Cypriot Administration, these three countries issued a declaration called "Cairo Declaration" in 2014 and called on Turkey to stop oil and gas exploration activities off the coast of Cyprus. At the summit held in Nicosia in 2017, which was attended by the President of Egypt and the Prime Minister of Greece, the main agenda item was the transportation of the Eastern Mediterranean energy resources to Europe. GASC, which improved its bilateral relations by evaluating the tense situation between Egypt and Turkey after the coup, improved its cooperation with Egypt. So much so that Egypt's ambassador to Cyprus openly threatened Turkey with war after the search efforts of the GCASC in the disputed region were blocked by Turkey. In the ongoing process, joint summits continued and they condemned Turkey's attitude in the sixth trilateral summit held in Crete. These developments are described as concrete steps of the alliance established against Turkey in the region.[158] This political polarization in the region creates uncertainties for the future of the Eastern Mediterranean.

On the other hand, Egypt's EEZ restriction agreement with the Greek Cypriot Administration causes Turkey to lose its maritime jurisdiction areas and also causes Egypt to lose its maritime jurisdictions. The distance between Cape Arnauiti and Cape Victory, understood to have been taken as the relevant coast in the agreement between Egypt and

[157]Harunoğulları, 2020, **a.g.k.**, 474.
[158]İstikbal ve Boyraz, 2019, **a.g.k.**, 78-79

the Greek Cypriot Administration, is 197,659 miles, while the related coastline of Egypt is 400,128 miles. Egypt, which has twice the length of the coast according to the Greek Cypriot Administration, lost more than 21,500 square kilometers of maritime jurisdiction in the Eastern Mediterranean with the EEZ restriction agreement. If Egypt realizes this loss of maritime jurisdiction, it may terminate this treaty through its constitutional institutions. Moreover, there is a case that can be accepted as a precedent on this subject. The agreement signed between Greece and Albania in 2009 on the delimitation of the continental shelf and sea areas was later annulled by the Constitutional Court of Albania in 2010, on the grounds that the Albanian side lost 225 square kilometers of sea area.[159]

2.3.6. Libya

The width of its territorial waters is 12 miles in line with the Libyan Law on the 1959 Territorial Waters. In addition, it notified the fishing protection area of 62 nautical miles from the outer border of Libyan territorial waters to the UN in 2005. Later, Libya declared the Exclusive Economic Zone (EEZ) on May 27, 2009, in accordance with international conventions and using straight lines, and placed maritime jurisdictions in the region on a legal basis. Moreover, when Libya declared an EEZ, it emphasized that it could negotiate the EEZ delimitation with states with mutual coasts. Having disputes with riparian countries on maritime jurisdictions in the Eastern Mediterranean, Libya has brought its dispute with Tunisia to the ICJ. In the Tunisia-Libya Case of 1982, the ICJ evaluated the situation of Kerkenna and Djerba Islands, which are close to the Tunisian coast according to the middle line, and recognized "half effect" on Kerkenna. On the other hand, ICJ has never taken into account the limitation of Djerba Island, indicating that other elements in the region are more important. Libya has brought the issue of limitation of the continental shelf to the ICJ together with Malta, where it has a dispute in its maritime jurisdictions. According to ICJ, the restriction should be made in accordance with the agreement and the principles of fairness and by considering all relevant conditions. The ICJ made its decision on the principle of fairness and ruled that the delimitation between an island and the mainland should result in favor of Libya, the mainland state, in accordance with the measure of fairness.[160]

[159]Yaycı, 2012, **a.g.k.**, 37-38.
[160]C. Yaycı (2011). *Doğu Akdeniz'de Deniz Yetki Alanlarının Sınırlandırılmasında Libya'nın Rolü ve Etkisi*. Güvenlik Stratejileri Dergisi, 7(14), s. 22-26.

Libya has taken another important step in the Eastern Mediterranean by signing an EEZ restriction agreement with Turkey regarding its mutual coasts in 2019. Two treaty memoranda were signed between the Libyan Government of National Consensus and Turkey on November 27, 2019, one on the limitation of maritime jurisdictions and the other on security and military cooperation. Libya reached an agreement with Turkey on the EEZ delimitation and obtained 16,700 square kilometers more sea area according to an agreement with Greece.[161] According to the agreement made on the basis of the middle line, the coordinates of the lines accepted as mutual coasts between the two countries and the borders determined in this direction are shown in Figure 2.5. In the figure, the A-B line is the borders determined between Turkey and the TRNC in 2011, the C-D-E line is the borders drawn between Turkey and Egypt on the basis of the middle ground line between the main lands, the E-F line is the borders drawn according to the EEZ restriction agreement signed between Turkey and Libya in 2019, and the G-H line is the external borders of Greek territorial waters.

Figure 2. 10. *Marine Jurisdiction determined by the Memorandum of Turkey-Libya*

Source: NTV

[161]Harunoğulları, 2020, **a.g.k.**, 474-475.

2.3.7. Greece and Cyprus

The basis of the basic policies of Greece in the Eastern Mediterranean is that Greece makes maritime jurisdiction restrictions based on the middle line based on the "Crete, Kashot, Kerpe, Rhodes and Meis" line. Based on this line, Greece aims to take away Turkey's continental shelf rights. Greece wants to add a diplomatic dimension to this policy by making bilateral negotiations with coastal countries. In this context, it is negotiating with Egypt, Libya and the Greek Cypriot Administration for the EEZ delimitation.[162] Based on the middle lines with the Greek Cypriot Administration, Greece aims to limit Turkey in the Eastern Mediterranean only with the Gulf of Antalya. As mentioned earlier in the study, since the islands in question have the status of "islands on the opposite side" according to the middle line, they cannot form a coast in the EEZ delimitation and cannot have a continental shelf outside of territorial waters. This situation is clearly understood from international judicial and arbitration decisions.

The Greek governments, seeking new sources of income to raise their economies damaged by the 2008 global financial crisis, saw the energy resources discovered in the Eastern Mediterranean as a beacon of hope. Acting with Greece in the Eastern Mediterranean, the Greek Cypriot Administration follows a two-pronged alliance strategy with Egypt on the one hand, and Israel on the other, and sees itself as the actor that guides these alliances. While Greece closes the South West coasts of Turkey over Meis and Crete, GASC acts as the one-sided owner of the entire island, ignoring TRNC, which has the right to speak on the island, and Turkey, which has the longest coastline in the Mediterranean. In this context, the GASC signed an EEZ delimitation agreement with coastal countries and divided the region into 13 parcels unilaterally. Southern Cyprus has agreed with international energy companies such as American (ExxonMobil and Noble), French (Total), British (BP), Italian (ENI), Qatari (Qatar Petroleum) and Korean (Kogas) and shared the unilaterally declared parcels to take the issue in the region to the global dimension, to find support and to overcome financial difficulties in extracting and transporting energy resources. The existence of various international companies in these parcels declared unilaterally by the GASC reveals the global competition in the region. On the other hand, EU countries aiming to reduce energy dependence on Russia provide financial support to the Eastern Mediterranean Natural Gas Pipeline project, which will

[162]Yaycı, 2011, **a.g.k.**, 27.

pass through GASC and Greece for the transportation of energy resources in the region to the EU. With the agreement signed, the Greek Cypriot Administration both reduced its financial burden and took an important step in the energy equation in the region by taking the EU against Turkey.[163]

2.3.8. Turkey and TRNC

Turkey's energy policies have recently been developing both to become a regional energy center and to provide energy to meet the increasing domestic demand. With the increasing energy consumption in recent years, the necessity to meet the domestic demand has gained importance. The International Energy Agency's announcement that energy consumption in Turkey will double by 2025 confirms this.[164] In this context, energy policies are extremely important for Turkey, which meets most of its energy needs with imports. This situation is directly reflected in the current account deficit in Turkey, which has paid an average of 54 billion dollars annually for the energy and mining sectors in the last 15 years. In this context, developments in the Eastern Mediterranean are closely followed for Turkey, which is trying to reduce its energy imports. The main strategy followed by the TRNC, which has been excluded due to the division of the island and the unilateral attitude of the Greek Cypriot Administration and cannot take a share from the discovered energy resources, and Turkey, which has national security, in the region; It is based on reducing foreign dependency in energy and weakening the alliance initiatives that other countries in the region are trying to establish.[165]

Turkey, which is one of the biggest powers in the Eastern Mediterranean, represents the legal rights of both itself and the Turkish Republic of Northern Cyprus. Turkey and TRNC together opposed the Ministry of National Education, which was declared unilaterally by the GASC and divided into 13 parcels, which is approximately 51 thousand square kilometers. Turkey gave the EEZ it determined to the UN Secretary General on 10 April 2019. Turkey regards the recent developments in the Eastern Mediterranean as a security issue. Turkey considers it as an economic threat that the Greek Cypriot Administration of Southern Cyprus conducts exploration activities in the region it has declared unilaterally and that the prosperity to be obtained from the

[163]İstikbal ve Boyraz, 2019, **a.g.k.**, 74-75.
[164]Harunoğulları, 2020, **a.g.k.**, 471.
[165]İstikbal ve Boyraz, 2019, **a.g.k.**, 80.

discovered energy resources only covers the GCASC. In this context, it has taken the necessary steps to protect the interests of both Turkey and the TRNC. On the other hand, the cooperation of the GCASC with countries such as Israel and Egypt, with which Turkey has recently broken relations, constitutes the security aspect of the issue. In this context, Turkey needs to improve its relations with riparian countries in order to overcome the problems in the region.[166]

Turkey has taken steps regarding the Eastern Mediterranean not only in the recent period, but also in 1974, when the Cyprus crisis peaked. So much so that Turkey granted a license to a region south of Rhodes in 1974, and has signed an application that can serve as a reference in future cases. In the following years, the continental shelf limitation agreement was signed between Turkey and the TRNC in 2011, after the Greek side signed agreements with other countries and maintained the same attitude with the support of Greece. With this agreement, Turkey was authorized by the TRNC to search for oil in the eastern and northern parts of the island. However, the areas authorized by the TRNC overlap with the areas unilaterally determined by the Greek Cypriot Administration. In Figure 2.6, 13 parcels within the EEZ area announced unilaterally by the Greek Cypriot Administration and the areas where they are in dispute are shown. In February 2018, Turkish warships prevented the Italian Drilling ship, which was licensed by the GASC, from entering the area in the disputed area for drilling work. This event was interpreted by experts as the "price of the deadlock on the island". On the other hand, after 2017, Turkey intensified its exploration activities around Cyprus. The search by the Turkish Barbaros Hayrettin Pasha Ship in block 9, one of the disputed regions, which was tendered by the Greek Cypriot Administration to Italian ENI and South Korean KOGAS companies, increased the tension in the region. The Greek administration, which threatened to arrest the crew of the Fatih Sondaj ship sent to the region in 2019, received a great reaction from Turkey. On the other hand, the US administration, which became the party of the problem due to the energy company in the region, took a stand against Turkey and called on Turkey to stop its activities in the region. Likewise, the EU, which stands across Turkey, has clearly shown that it is behind the GASC with its statement.[167]

[166]Hava, 2020, **a.g.k.**, 693-697

[167]Tuncer ve Altınsoy, 2020, **a.g.k.**, 30-34.

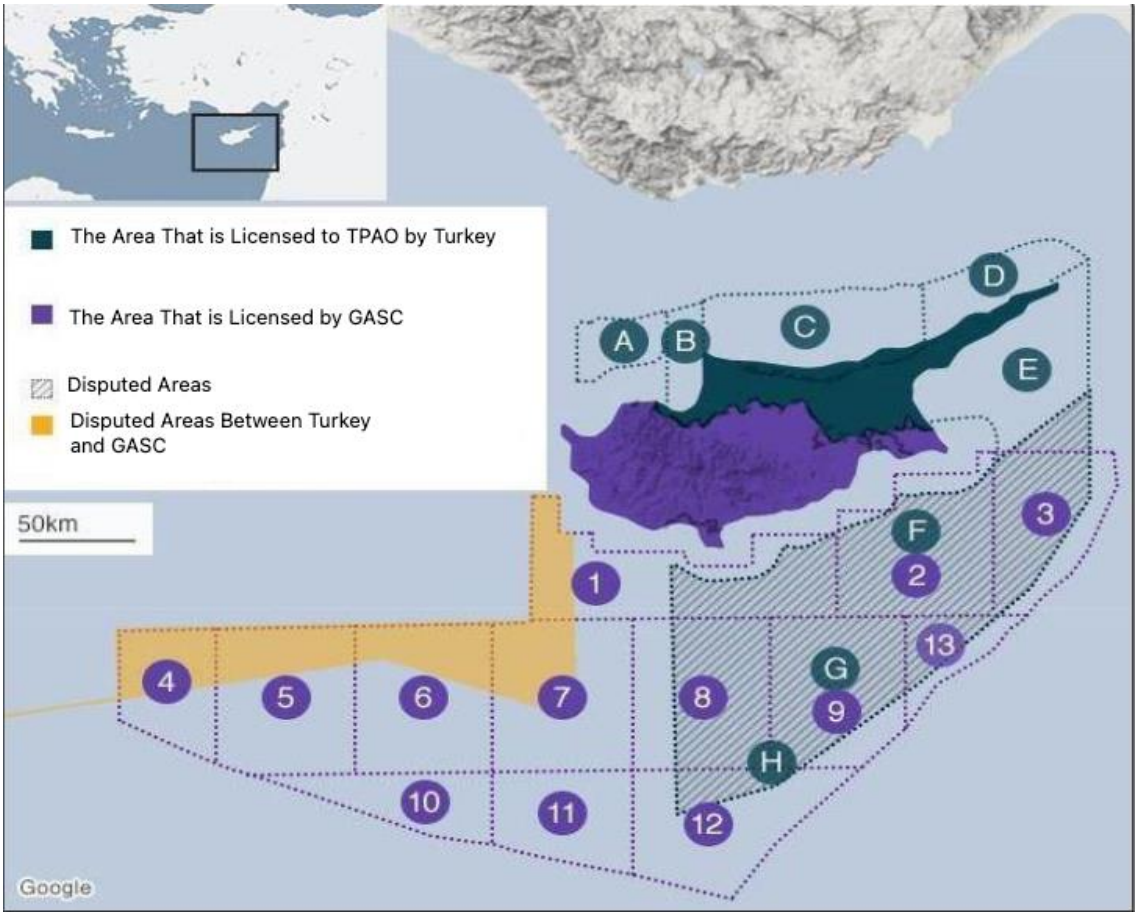

Figure 2. 11. *The Claims of GASC and Disputed Areas*

Source: Kıbrıs Tarım, Çevre ve Kırsal Gelişim Bakanlığı & TPAO

Tensions have increased in the region lately, as international actors have become a part of the equation in the Eastern Mediterranean. In this process, Turkey has strengthened its hand in the face of these developments by purchasing new ships to be used in exploration and drilling activities in the Eastern Mediterranean. Fatih drill ship, which entered the TPAO inventory in 2017, is the first drill ship in Turkey. Fatih drill ship started its activities in the Mediterranean after the necessary maintenance and equipment was completed. Later in 2018, the Yavuz drill ship, purchased for 262.5 million dollars, was added to the TPAO inventory in order to increase the exploration and drilling activities in the sea. Again, this ship started its mission in the Mediterranean in 2019 after its maintenance and equipment was completed. The third drilling ship of Turkey, Kanuni drilling ship, joined the TPAO inventory in 2020 and started its duty. In addition to drilling ships, there are also seismic research vessels in the TPAO inventory. Barbaros Hayrettin Paşa seismic research vessel was purchased in 2013 and started its operations.

Finally, the construction of the Oruç Reis seismic research ship, which was started in Istanbul and has a ninety percent localization rate, was completed in 2015. This ship, which belongs to MTA, started its activities in the Mediterranean in April 2017 to search for oil and hydrocarbons. After the increasing tension with Greece in the region, Germany intervened and the ship suspended its activities for a while. However, as of August 2020, Turkey has continued its exploration activities by broadcasting NAVTEXs in the region. According to the information provided by TPAO, these drill ships have operated in 8 different regions in the last two years.[168] In addition, Turkey's first floating LNG storage and gasification vessel (FSRU) "Ertuğrul Gazi" reached Turkey by April 2021. The ship, which was produced in South Korea in 2020, pulled the Turkish flag on April 3, 2021 and berthed to the BOTAŞ Dörtyol FSRU terminal. This development is of great importance in terms of energy supply security. Ertuğrul Gazi is one of the ships with the highest capacity in the world with its gasification capacity of 28 million cubic meters. In addition, this ship, which has a storage capacity of 170 thousand cubic meters, has a very important feature in terms of storage. FSRU facility investments provide the opportunity to supply gas from different source countries or spot markets without being dependent on pipelines.[169]

In addition to these, Turkey, which has recently increased its activities in the Eastern Mediterranean, is also developing its relations with coastal countries. In this context, the details of the agreement he signed with Libya are given before under the Libya title. To summarize briefly, with the agreement signed in 2019, Turkey and Libya signed two memorandums of agreement regarding EEZ delimitation and military cooperation on their mutual coasts. The limits determined for this agreement are shown in Figure 2.5 under the Libya title. With this agreement, Turkey has prepared a legal and legitimate ground in the Mediterranean by signing an EEZ delimitation agreement with a riparian state in the Mediterranean for the first time. As a result of this agreement, Greece has been blocked from making delimitation agreements with Egypt and GASC.

Giving an interview to Anadolu Agency, Bahçeşehir University (BAU) Maritime and Global Strategies Center President Cihat Yaycı evaluated the recent developments in the region. Recently, in the tender that Egypt has issued for hydrocarbon exploration

[168]https://www.bbc.com/turkce/haberler-turkiye-53867412 (Erişim Tarihi: 22.04.2021)

[169]M. Temizer ve B. Milli (2021). *"Türkiye'nin ilk yüzer LNG depolama ve gazlaştırma gemisi Ertuğrul Gazi Türkiye'ye ulaştı"*. Anadolu Ajansı, (22.04.2021).

studies in the Eastern Mediterranean, drawing borders by taking into account Turkey's continental shelf is considered as an indicator of good will to improve relations. In this context, Yaycı pointed out that Egypt and Turkey have common interests, and emphasized that it is important and necessary for the two countries to make an agreement. If Egypt restricts itself with Turkey instead of Southern Cyprus, it will gain an additional 11,500 square kilometers, that is, more than the area of Cyprus Island. According to Yaycı, Turkey and Egypt will be effective powers in the Eastern Mediterranean and the world energy market thanks to the good relations and cooperation they will develop between them. Accordingly, it seems likely that Egypt and Turkey will sit on the table in the near future in terms of their common interests.[170] So much so that Foreign Minister Mevlüt Çavuşoğlu pointed out that a new era in relations with Egypt has begun and stated that mutual visits and negotiations can take place within this framework.

2.4. Global Competition in the Eastern Mediterranean

The Eastern Mediterranean has been a region where conflicts of interest of global powers have been experienced from the past to the present. The region, which was important for the control of trade routes in the past, is still gaining importance today as a trade-oriented competition center. The region, which gained strategic importance in terms of energy resources with the First World War, started to become the basis of international problems with the efforts of countries such as NATO, the USA and the USSR to increase their influence in the region during the Cold War. In addition, the EU's increasing interest in the region with the processes of "Mediterranean Cooperation" and "Barcelona 1995" confirms the global competition in the region. On the other hand, upon the increasing security risks in the region, NATO started to operate under the name of "Operation Effective Effort" in order to ensure peace and stability.[171] Turkish Armed Forces have been carrying out Operation Mediterranean Shield operations since 2006 to support NATO's activities and to ensure energy supply security in the region. The purpose and scope of Operation Mediterranean Shield[172] has been expanded due to reasons such as exploration and drilling activities carried out in the so-called EEZ, declared by the Greek

[170]E. Ş. Cevrioğlu ve B. Begçecanlı (2021). "*Doğu Akdeniz'de olası Türkiye-Mısır ittifakı iki ülke için yeni kapılar açabilir*". Anadolu Ajansı, (16.04.2021).
[171]Kedikli ve Çalağan, 2017, **a.g.k.**, 125.
[172] For detailed information about Operation Mediterranean Shield, see; https://www.dzkk.tsk.tr/Harekat/icerik/akdeniz-kalkani-harekati

Cypriot Administration, the efforts of countries such as Greece, Southern Cyprus and Egypt to cooperate in their maritime jurisdiction areas, the crisis in Syria and the increasing activities of non-regional actors in the Eastern Mediterranean. In addition to all these, the Eastern Mediterranean is evaluated in terms of geopolitical theories as follows;

> "According to Mackinder's theory of land domination, the Eastern Mediterranean is the focal point of maritime trade to its central region- the heartland. According to Mahan's theory of sea domination, the Eastern Mediterranean, which is located on the trade routes between the east and the west and is the only window of the Black Sea countries to the world, has a very important weight in global trade. According to the air domination theory of Douchet, it provides the opportunity to intervene from the air in the Eastern Mediterranean, the Balkans, the Middle East and the Caucasus and the southeastern wing of the central region. According to Spykman's border belt theory, the Eastern Mediterranean, which is in direct contact with Greece and Turkey, and indirectly with Iraq and Iran, controls a significant part of the border belt surrounding the central region."[173]

With the end of the Effective Effort Movement in 2016, the "Sea Guardian" operation was initiated in order to ensure security and control in the Mediterranean. On the other hand, the USA, by closely paying attention to the security and control of energy transmission lines in the Eastern Mediterranean, brought this issue to the parliament. The draft law of "Eastern Mediterranean Security and Energy Partnership Act of 2019" was discussed in the Parliament. In this context, the security of the allies and partners in the Eastern Mediterranean, the importance of Greece for stability in the region, the strategic importance of Israel and Cyprus for the USA, the obligation to impose sanctions in case Turkey acquires S-400 missile defense systems from Russia Issues such as the fact that it will save Europe from dependence on Russia and the security, development and continuity of energy exploration studies are discussed in this draft law. Accordingly, it was decided to support cooperation between Israel, Greece and Cyprus for energy, security and protection of infrastructures and to encourage energy infrastructure investments. In addition, it is important for the US interests in the region to make efforts to rebuild a bi-communal federal structure in Cyprus and to support all kinds of security and economic support of Cyprus and all efforts to prevent Russia's initiatives. With the end of the Effective Effort Movement in 2016, the "Sea Guardian" operation was initiated

[173] D. Yıldız ve D. Yaşar (2012). *Doğu Akdeniz'de Küresel Satranç*. Truva Yayınları, s. 42-43'ten aktaran C. Özgen (2013). *Doğu Akdeniz'de Enerji Güvenliğine Yönelik Bir Girişim: Akdeniz Kalkanı Harekâtı*. Akademik Orta Doğu, 8(1), s. 101-114.

in order to ensure security and control in the Mediterranean. On the other hand, the USA, by closely paying attention to the security and control of energy transmission lines in the Eastern Mediterranean, brought this issue to the parliament. The draft law of “Eastern Mediterranean Security and Energy Partnership Act of 2019” was discussed in the Parliament. In this context, the security of the allies and partners in the Eastern Mediterranean, the importance of Greece for stability in the region, the strategic importance of Israel and Cyprus for the USA, the obligation to impose sanctions in case Turkey acquires S-400 missile defense systems from Russia Issues such as the fact that it will save Europe from dependence on Russia and the security, development and continuity of energy exploration studies are discussed in this draft law. Accordingly, it was decided to support cooperation between Israel, Greece and Cyprus for energy, security and protection of infrastructures and to encourage energy infrastructure investments. In addition, it is important for the US interests in the region to make efforts to rebuild a bi-communal federal structure in Cyprus and to support all kinds of security and economic support of Cyprus and all efforts to prevent Russia's initiatives. With the end of the Effective Effort Movement in 2016, the "Sea Guardian" operation was initiated in order to ensure security and control in the Mediterranean. On the other hand, the USA, by closely paying attention to the security and control of energy transmission lines in the Eastern Mediterranean, brought this issue to the parliament. The draft law of “Eastern Mediterranean Security and Energy Partnership Act of 2019” was discussed in the Parliament. In this context, the security of the allies and partners in the Eastern Mediterranean, the importance of Greece for stability in the region, the strategic importance of Israel and Cyprus for the USA, the obligation to impose sanctions in case Turkey acquires S-400 missile defense systems from Russia Issues such as the fact that it will save Europe from dependence on Russia and the security, development and continuity of energy exploration studies are discussed in this draft law. Accordingly, it was decided to support cooperation between Israel, Greece and Cyprus for energy, security and protection of infrastructures and to encourage energy infrastructure investments. In addition, it is important for the US interests in the region to make efforts to rebuild a bi-communal federal structure in Cyprus and to support all kinds of security and economic support of Cyprus and all efforts to prevent Russia's initiatives. With the end of the Effective Effort Movement in 2016, the "Sea Guardian" operation was initiated in order to ensure security and control in the Mediterranean. On the other hand, the USA,

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[174] B. Algür (2020). *Kıbrıs ve Doğu Akdeniz’deki Son Uluslararası Gelişmeler Işığında Değişen Türkiye, ABD ve NATO Politikaları*. Anadolu Strateji Dergisi, 2(2), 64-65.

Another state included in the global competition equation in the Eastern Mediterranean is Russia. Russia wants to reach the Eastern Mediterranean with its Eurasianism policy. For Russia who wants to establish Eurasian domination, it is extremely important to ensure security in the Eastern Mediterranean. In this context, Russia is in an effort to gain political gains in the region by intervening in the internal turmoil in Syria. In addition, Russia wants to take control of transit routes in the Middle East by landing its navy in the Mediterranean. In this context, the aim of Russia, which wants to develop good relations with the countries in the region, is to protect the current energy market and to get a share from the energy pie in the region. On the other hand, another state that tries to be included in the energy equation in the region, despite being very far from the region, is China. With the "One Belt One Road" project that China has followed, it is trying to make east-west trade faster and more profitable by establishing a connection to Europe via Iran and Turkey. Thus, China takes care of the stability of regional actors. Acting with Russia to be effective in the region, China organizes joint military exercises in the region. It also develops good relations with GASC on energy investments.[175]

In addition to its geopolitical importance, the energy resources discovered in the region have also increased the importance of the Eastern Mediterranean in recent years. The sharing of maritime jurisdiction areas that came to the agenda with the discovered energy resources and the disputes arising from this sharing increased the tension in the region. In addition to its rich energy resources, the Eastern Mediterranean region is also an important region in terms of being an energy transfer hub for transporting energy resources in Central Asia and the Caucasus to international markets. The region has critical importance in terms of energy supply security with its existing pipelines and planned pipelines. Thus, both regional and global powers are making attempts to ensure security in the region and to prevent an energy crisis on a global scale. Energy resources determine the power struggle in the international system. In this context, the importance of the Eastern Mediterranean and therefore Cyprus has increased considerably recently with the discovered energy resources. Dominating Cyprus has become a necessary condition for dominating the Eastern Mediterranean. Because Cyprus, due to its location,

[175] E. Örselli ve V. Babahanoğlu (2019). *Doğu Akdeniz'de Açılmaya Çalışılan Pandoranın Kutusu: Enerji Kaynaklarından Alan Hâkimiyetine Uzanan Ekonomi Politik Hesaplar.* Uluslararası Sosyal Araştırmalar Dergisi, 12(66), s. 395-396.

is at a very strategic point in terms of controlling the trade routes in the Eastern Mediterranean and being the main stop of maritime trade between east and west. Moreover, it has a very critical position in terms of controlling the Middle East geography. This critical importance has increased with the discovered energy resources of the island.[176]

After GASC became a member of the EU in 2004, it took action and signed EEZ restriction agreements with the countries in the region. At this point, the support provided by the EU to the GASC causes the problems to continue. The most important reason for the EU's interest in the Eastern Mediterranean is that it wants to reduce its energy dependency on Russia. In this context, the EU sees the GASC as a potential energy supplier. Thus, by using its membership status, the GASC is in an effort to justify its activities contrary to international law. As stated in the previous sections of the study, the GASC, acting as the sole owner of the island while making the EEZ delimitation agreements, ignored the rights of the TRNC and occupied the maritime jurisdictions of both Turkey and the TRNC with the license areas it determined illegally. Reacting to this situation, the Ankara Government declared by stating that the agreements made were unlawful and that they did not accept the agreements. Turkey has had problems with Israel in the region, as well as with Greece and the Greek Cypriot Administration of Cyprus. The "Mavi Marmara Incident" and "Gaza Attacks" lie at the root of these problems causing diplomatic crises. On the other hand, the EU's Eastern Mediterranean energy geopolitics is at odds with Russia's interests. In this context, Russia, which wants to be active in the Eastern Mediterranean, establishes close relations with Israel. The USA indirectly intervenes in the energy equation in the region by supporting the oil companies operating in the region. One of the main reasons why the USA does not directly support EU projects in the region is that the USA needs the support of Turkey, which has military power in the region. The fact that Turkey has the longest coast in the Eastern Mediterranean and the right to be a guarantor on the Island of Cyprus have been effective in having a key role in the region.[177]

Turkey's Eastern Mediterranean policy has been considered as defensive realism policy. Whether it is the Cyprus operation or the policies it has followed against the

[176]Kedikli ve Çalağan, 2017, **a.g.k.**, 126-129.
[177]Kedikli ve Çalağan, 2017, **a.g.k.**, 131-135.

usurpation of maritime jurisdictions, Turkey's policies have been aimed at protecting both its own rights and the TRNC's rights. However, attempts to protect Turkey's rights have been described as aggressive by other international actors who want to be active in the region. The involvement of actors such as the USA and the EU, which are trying to be effective in the region through Russia and energy companies that have settled in the region with the Syrian crisis, carries the risk of turning a regional problem into a global problem. Turkey is in an effort to keep these actors away from the region and not to make their rights a matter of discussion with these actors. Evaluating Turkey's increasing power in order to protect its rights in the region in terms of neo-realist theory, Kökyay stated that "it is inevitable for this power to be balanced by another state or to create an alliance against this power". In order to overcome the security problem emerging in the region, Turkey is seeking to expand the cooperation of the opposing forces to break alliances. In addition, Turkey has recently increased its military power with modern naval forces and advanced technology weapon systems in order to ensure its security and protect its rights in the region.[178]

2.5. Possible Reflections of Potential Energy Discoveries in the Eastern Mediterranean on the Turkish Economy

It was also stated in the previous sections of the study that the problem of energy sharing is the basis of the competition in the Eastern Mediterranean. In addition to the security aspect of this problem, the economic aspect is an important issue that needs to be addressed. Considering that the total hydrocarbon reserves in the region are an estimated 122 trillion cubic feet (approximately 3.45 trillion cubic meters) of natural gas and 1.68 billion barrels of oil, this creates a very important gain and opportunity for energy importing countries in the region. According to research conducted by international energy companies, it is estimated that the global energy need will increase by 25% until 2040 with the contribution of non-OECD countries. In addition, according to the estimates made about natural gas demand, 40% increase in natural gas demand is

[178]F. Kökyay (2020). *Neorealizm Kuramı ve Türkiye'nin Doğu Akdeniz Enerji Politikası.* İnsan ve Toplum Bilimleri Araştırmaları Dergisi, 9(3), s. 2522-2524.

expected until 2040. According to the results of similar studies, it is estimated that the share of natural gas in global energy demand will increase.[179]

With the increasing income level and production need in Turkey, the energy demand is also increasing. However, the high level of foreign dependency in energy brings along foreign trade deficits. According to the latest data from TURKSTAT, the total import in 2020 is about 219 billion dollars. The total amount paid by Turkey for energy imports in 2020 is approximately 28.9 billion dollars. It can be thought that the pandemic had an effect on the decrease in energy imports, which was 41.1 billion dollars in 2019, so much in 2020. Therefore, the data for 2020 can be misleading. However, when the average of energy imports by years is taken, the average energy import data of the last 10 years is 44 billion dollars. Such foreign dependency in energy constitutes a high cost element for the country. On the other hand, Turkey, which has the advantage of being an energy transit country thanks to its strategic location between energy producer and consumer countries, has a critical importance in transporting the energy resources to be discovered in the region to European countries that want to get rid of the dependence on Russia. In the light of these data, Turkey's spending billions of dollars on energy every year has a direct impact on foreign trade deficits and poses a risk for energy supply security. In this context, hydrocarbon resources to be discovered in the Eastern Mediterranean constitute an important opportunity for Turkey.

Although Turkey's Eastern Mediterranean Policy is not independent from the Blue Homeland doctrine, it would not be wrong to make an assessment on the energy resources discovered in the Black Sea. Discovered 320 billion cubic meters of natural gas reserves in the Black Sea in 2020 is an important development for the Turkish economy in terms of both national income and domestic production costs. Depending on its use, this reserve, which has the capacity to meet Turkey's natural gas need for 7-8 years, can be used for 32 years if 10 billion cubic meters of it is extracted annually. Considering that Turkey imports an average of 45-50 billion cubic meters of natural gas per year, energy imports may decrease annually by 20% for 32 years, with 10 billion cubic meters of domestic production per year. However, in order to use these natural gas reserves, necessary

[179]R. Yorulmaz (2019). *Doğu Akdeniz'de Yeni Enerji Kaynaklarının Ekonomi Politiği*. Ortadoğu Araştırmaları Merkezi, s. 1.

investments such as production planning, establishment of facilities and platforms and laying of pipelines need to be made.[180]

It is estimated that the economic value of the reserve is 80 billion dollars and the necessary investments are approximately 6 billion dollars, but this investment is considered as a beneficial investment in order to keep the foreign currency flowing abroad every year and to direct this money to domestic investments, R&D studies and technological developments. In addition, the reflection of the cost reduction in energy-intensive sectors on the prices is very important in terms of both providing price advantage to the citizens in the country and the reflection of this cost advantage to the export by turning this cost advantage into an opportunity in international trade. Moreover, this cost advantage is likely to exert a downward pressure on inflation and, thanks to domestic energy generation, prices will be less affected by the exchange rate effect and developments in the world. In addition, the current account deficit problem, which has become a chronic problem due to high energy imports, not only negatively affects the national income of the country but also causes to reduce global competitiveness of businesspeople in investments due to high interests. In this context, it is expected that the current account deficit problem will be solved to a great extent if Turkey decreases its energy imports and even becomes an energy exporter with the newly discovered reserves. Turkey should use the fossil fuels it discovers by using this cost advantage in domestic natural gas production in terms of renewable energy infrastructure, digital transformation and industrialization as a step in transition to renewable energy sources. In this process, Turkey should increase its knowledge on offshore platforms and invest in renewable energy sources such as offshore wind power generation.[181]

[180]E. Nuroğlu (2020). *"Türkiye'nin doğalgaz keşfinin ekonomik yansımaları"*. Anadolu Ajansı (31.08.2020)
[181]Nuroğlu, 2020, **a.g.k.**, 1.

CHAPTER THREE

3. ECONOMETRIC ANALYSIS OF THE RELATIONSHIP BETWEEN ENERGY IMPORT, ECONOMIC GROWTH AND CURRENT ACCOUNT DEFICIT IN TURKEY

3.1. Literature Review

Studies examining the relationship between energy imports, economic growth and current account deficit are very few. For this reason, studies that examine the relationships of these variables with each other have been classified separately.

3.1.1. Studies examining the relationship between energy imports and economic growth

Table 3. 1. *Studies examining the relationship between energy imports and economic growth*

Source	Method	Variables	Findings
Demir (2013)	VAR analysis	Current account deficits, industrial production and energy imports	He found that there is a one-sided causality from the industrial production index and energy imports to current account deficits
Yılmaz, Taş and Yapraklı (2015)	VAR analysis	Energy imports and economic growth	They concluded that energy imports and growth go hand in hand in the long run.
Güneş and Erol (2017	Johansen cointegration analysis	Energy imports, current account deficit and economic growth	As a result of the analysis, a bidirectional but weak causality was found between current account deficit and growth. They concluded that the increase in energy imports has a high impact on growth, as energy consumption increases, growth will also increase, the increase in growth will increase the current account deficit and the current account deficit will increase growth.

Table 3. 2. ***(Continuation)*** *Studies examining the relationship between energy imports and economic growth*

Sarıtaş and Genç and Avcı (2018)	VAR analysis and Granger causality analysis	Current account deficit, growth rate and energy imports	A positive bi-directional relationship was found between economic growth and energy imports. At the same time, 31.94% of the change in economic growth is due to energy imports.
Çalışkan (2019)	Panel VAR analysis	Energy imports and economic growth	He found that energy import and economic growth variables follow them and affect each other in the long run. At the same time, a causality from economic growth to energy imports was discovered in the study.
Şişeci and Yamaçlı (2020)	Johansen cointegration analysis	Energy imports, GDP and exchange rate	They found a cointegrated relationship between real energy imports, real GDP and real effective exchange rate. In this context, they concluded that economic growth positively affected real energy imports

3.1.2. Studies examining the relationship between energy imports and current account deficit

Table 3. 3. *Studies examining the relationship between energy imports and current account deficit*

Source	Method	Variables	Findings
Yanar and Kerimoğlu (2011)	Johansen cointegration analysis	Economic growth, energy consumption and Current account deficit	Growth increases energy consumption and increases in energy consumption increase the current account deficit
Demir (2013)	VAR analysis	Current account deficits, industrial production and energy imports	The increase in the production increased the energy demand, and consequently, the increase in the energy demand increased the energy imports and thus the current account deficit
Uysal, Yılmaz and Taş (2015)	VAR analysis and the Johansen cointegration analysis	Energy consumption and current account deficit	As a result of the analysis, they concluded that the variables act together in the long run.
Özaytürk and Alper (2017)	Panel methodology with the help of FGLS (Feasible Generalized Least Square)	GDP, the amount of imported oil and the level of financial development.	There is a positive relationship between oil imports and the current account deficit, and that oil imports had the greatest impact on the current account deficit.
Sarıtaş and Genç and Avcı (2018)	VAR analysis and Granger causality analysis	Current account deficit, growth rate and energy imports	The biggest cause of the current account deficit is energy imports. In the variance decomposition test, they concluded that energy imports have a high share in explaining the current account deficit.

3.1.3. Studies examining the relationship between economic growth and current account deficit

Table 3. 4. *Studies examining the relationship between economic growth and current account deficit*

Source	Method	Variables	Findings
Telatar and Terzi (2009)	VAR analysis and Granger causality test	Economic growth and current account balance	It was concluded that there is a one-way causality from the growth rate to the current account balance.
Yanar and Kerimoğlu (2011)	Johansen cointegration analysis	Economic growth, energy consumption and Current account deficit	As a result of the study, they concluded that the increase in economic growth will increase the current account deficit.
İlhan (2014)	VAR analysis and Granger causality test	Current account and economic growth	According to the Granger Causality Test, it is concluded that the causality relationship between the current account and economic growth is one-way. In the VAR Analysis, which includes all variables, a one-way causality relationship has been reached that economic growth is the cause of the current account deficit
Göçer and Gerede (2016)	Symmetric and asymmetric hidden causality tests	Current account, economic growth and inflation	It has been determined that there is a multi-directional causality relationship between economic growth and current account deficit.
Yıldız (2019)	VAR analysis Granger causality analysis	Foreign debt, economic growth and current account	It is concluded that the current account deficit has an increasing effect on economic growth.

3.2. Econometric Model and Dataset

When the theoretical and empirical literature is examined, it is understood that energy import, economic growth and current account balance are interrelated. However, the relationship of these variables with each other was generally examined in the form of

bilateral relations. The number of studies examining all three variables together is very few. The contribution of this study to the literature: The relations of energy import, economic growth and current account balance with each other will be analyzed with econometric analysis methods and evaluated within the scope of Turkey's Eastern Mediterranean Policy and Global Competition in the Eastern Mediterranean. In this context, the study will examine whether growth is the cause of energy imports, whether energy imports increase the current account deficit and the direction of causality. In this study based on Turkey, 88 observations were used by taking 3-month data for the period 1999-2020. Economic growth data were taken from TURKSTAT as "Production Method, Gross Domestic Product, (Based on 2009), Rate of Change". Energy import data were obtained from TURKSTAT in dollar terms, based on the section named "Mineral fuels, mineral oils and products obtained from their distillation, bituminous substances, mineral waxes". Current account data was obtained from the Central Bank Electronic Data Distribution System (EVDS) in million USD.

Within the scope of the study, the models established to investigate the possible short and long term relationships between energy imports and economic growth and current account balance variables are given below.

$$EIM_t = f(GDPGR_t, CAB_t) \tag{3.1}$$

$$GDPGR_t = f(EIM_t, CAB_t) \tag{3.2}$$

$$CAB_t = f(GDPGR_t, EIM_t) \tag{3.3}$$

Here, EIM_t stands for energy import, $GDPGR_t$ stands for gross domestic product growth rate ve CAB_t stands for current account balance.

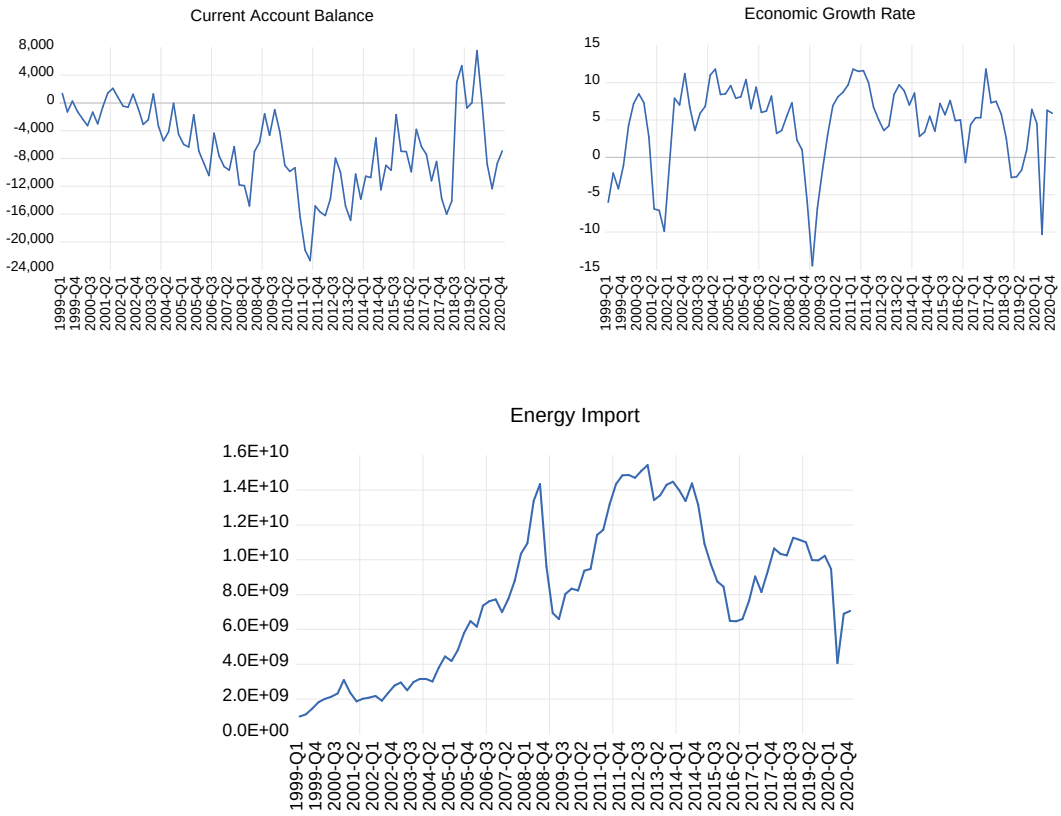

Figure 3. 1. *Time Series Graphics of the Series Used in the Study*

Time-series graphs in Figure 3.1 are drawn over raw data. Due to the fact that the variables included in the analysis include the growth rate, a proportional conversion was made for the other two variables and the rate of change compared to the previous year was calculated. In the study, the current account balance is defined as the current account balance rate of change (CAB), energy import is defined as the rate of change of energy imports (EIM), and economic growth is defined as the GDP growth rate (GDPGR).

3.3. Methodology

First, percentage change rates of variables were calculated and turned into percentage change data. The first step to be done in the time series analysis is that the stationarity tests of the data "The series whose variance, covariance and mean does not change over time is called the stationary series". The "spurious regression problem" arises in non-stationary series. For this reason, unit root tests "Augmented Dickey Fuller (ADF) and Phillips-Perron (PP)" were applied to find out whether the series are stationary or not. Since all variables are stationary at the level, the analysis was continued with the VAR

model. The appropriate lag length of the established VAR model was determined and it was tested whether there were autocorrelation and heteroscedasticity problems in the model. Then impulse response analysis was applied. Afterwards, variance decomposition was applied and the explanation rates of the variables were examined. Finally, Granger causality analysis was performed and the causality between variables was examined.

3.3.1. The Augmented Dickey-Fuller (ADF) test

In the Dickey-Fuller unit root test, u_t (error term) is assumed to be unrelated. Later, Dickey-Fuller developed another test for the case where u_t (error term) is related. This test they developed is also known as "Augmented Dickey-Fuller (ADF) unit root test". This test is performed by expanding the previous three equations by adding the lagged values of the dependent variable (Y_t). In the ADF test, as in the DF test, 3 regression models are used depending on whether the model contains constant terms or trends. These models are as follows;

$$\Delta Y_t = \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (3.4)$$

$$\Delta Y_t = \beta_1 + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (3.5)$$

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^{m} \alpha_i \Delta Y_{t-i} + \varepsilon_t \quad (3.6)$$

In the ADF test, it is tested whether $\delta = 0$ or not. If $\delta = 0$, there is unit root in series and the series is not stationary.

3.3.2. The Phillips–Perron (PP) unit root tests

Another test used to determine whether time series contain unit root is "Phillips-Perron (PP)" test. In their study conducted in 1988, Phillips and Perron suggested that these tests would be insufficient when the assumptions in the DF and ADF models were violated and they developed a "non-parametric" test to eliminate this situation. In addition to the autoregressive corrections of the ADF and DF equations, moving average corrections are also added to this test, which includes a correction mechanism. In its simplest form, the Phillips-Perron equation is as follows;

$$Y_t = \mu + \phi Y_{t-1} + u_t \quad (3.7)$$

$$(1 - \phi_1 L) Y_t = \mu + u_t \quad (3.8)$$

The unit root in the model is found with $1/\phi_1$ operation. If $1/\phi_1 = 1$, it means there is a unit root in series. In PP test patterns, the mean of error terms is equal to zero. However, the constant assumption of variance may be violated and there may be ordered dependence. Therefore, PP testing is not dependent on ADF or DF testing assumptions. Because the PP test fulfills the constant variance assumption by using the Newey-West error correction mechanism and eliminates the sequential dependence. Therefore, the PP test uses all the critical values used by ADF and DF testing. Hypothesis testing is done by testing the hypothesis as in the ADF test. Rejecting the hypothesis leads to the conclusion that the sequence does not contain unit roots, that is, it is stationary.[182]

3.3.3. Vector autoregression (VAR) model

The Vector Autoregression (VAR) Method was developed by Sims (1980). VAR models generalize univariate autoregressive models by allowing multivariate time series. This method is used to determine the relationship between two or more variables. While other models only look at a one-way relationship, the two-way relationship between variables is examined with the VAR method.[183] The standard equation for a 2-variable VAR model is shown below.

$$y_t = a_1 + \sum_{i=1}^{p} b_{1i} y_{t-i} + \sum_{i=1}^{p} b_{2i} x_{t-i} + \nu_{1t} \quad (3.9)$$

$$x_t = c_1 + \sum_{i=1}^{p} d_{1i} y_{t-i} + \sum_{i=1}^{p} d_{2i} x_{t-i} + \nu_{2t} \quad (3.10)$$

3.3.4. Granger causality test

The Granger causality test is a causality test used to determine whether there is causality between any two variables, and if there is, what is the direction of this causation. In the Granger causality test, the series must be stationary. However, there is no requirement that the series be stationary at the same level.[184] The regression equations of

[182]B. Kıran (2015). *Zaman Serileri Analizi*. İstanbul Üniversitesi Uzaktan Eğitim Uygulama ve Araştırma Merkezi. s. 9-10.
[183]H. Kalkavan, S. Eti ve S. Yüksel, S (2020). *Türkiye'deki Bankacilik Sektörü, Sanayi Gelişimi Ve Ekonomik Büyüme Arasindaki İlişkinin Var Analizi İle İncelenmesi*. Akademik Araştırmalar ve Çalışmalar Dergisi (AKAD), 12(22), s. 60.
[184]Telatar ve Terzi, 2010, **a.g.k.**, 127.

the Granger causality test, which investigates the causality relationship between two variables such as X and Y, are shown below.

$$\Delta X_t = \alpha_0 + \sum_{i=1}^{m} \beta_i \Delta X_{t-i} + \sum_{i=1}^{n} \gamma_i \Delta Y_{t-i} + \varepsilon_t \quad (3.11)$$

$$\Delta Y_t = \vartheta_0 + \sum_{j=1}^{p} \delta_i \Delta Y_{t-j} + \sum_{j=1}^{q} \phi_i \Delta X_{t-j} + \nu_t \quad (3.12)$$

3.4. Empirical Findings

In this part of the study, the results of the econometric analysis made in line with the data obtained are shared. Econometric analyzes were made on Eviews software.

3.4.1. Stationarity analysis

In order to test the stationarity of variables, Augmented Dickey-Fuller (ADF) unit root test and Phillips-Perron (PP) unit root test were applied. The results of these tests shown in Table 3.1., Table 3.2., Table 3.3. and Table 3.4.

Table 3. 5. *ADF unit root test in level*

VARIABLES	**Unit Root Test in Level**			
	Critical Values			**t-Statistic**
	1% Level	**5% Level**	**10% Level**	**P-value**
Current Account Balance (with intercept)	-3.522887	-2.901779	-2.588280	-4.173625 0.0014
Current Account Balance (with trend and intercept)	-4.088713	-3.472558	-3.163450	-4.075029 0.0104
Energy Import (with intercept)	-3.513344	-2.897678	-2.586103	-10.34199 0.0000
Energy Import (with trend and intercept)	-4.075340	-3.466248	-3.159780	-10.40106 0.0000
Economic Growth (with intercept)	-3.516676	-2.899115	-2.586866	-3.724946 0.0055
Economic Growth (with trend and intercept)	-4.075340	-3.466248	-3.159780	-4.403209 0.0038

Table 3. 6. *PP unit root test in level*

VARIABLES	Unit Root Test in Level			
	Critical Values			t-Statistic P-value
	1% Level	5% Level	10% Level	
Current Account Balance (with intercept)	-3.513344	-2.897678	-2.586103	-10.22395 0.0000
Current Account Balance (with trend and intercept)	-4.075340	-3.466248	-3.159780	-10.50491 0.0000
Energy Import (with intercept)	-3.513344	-2.897678	-2.586103	-10.15585 0.0000
Energy Import (with trend and intercept)	-4.075340	-3.466248	-3.159780	-10.40106 0.0000
Economic Growth (with intercept)	-3.513344	-2.897678	-2.586103	-4.690766 0.0002
Economic Growth (with trend and intercept)	-4.075340	-3.466248	-3.159780	-4.708490 0.0014

To understand whether the series are stationary or not, you can look at t-statistics values or p-value values. When the critical value and t-statistics values are compared within the absolute value, if the calculated t-statistic value is greater than the critical value, the series is stationary; otherwise, the series is not stationary. Looking at the tables, all variables are stationary at 1% significance level, with both "intercept" and "trend and intercept" forms. So, it can be concluded that all series do not contain unit-roots.

3.4.2. Determining the appropriate lag length

It is necessary to determine a suitable lag length for the VAR model. Information criteria such as LR (LR test statistics), FPE (Last prediction error), AIC (Akaike information criterion), SC (Schwarz information criterion) and HQ (Hannan-Quinn information criterion) are used to determine the appropriate lag length. These information criteria indicate the optimum lag length.

Table 3. 7. *Lag Length Determination Criteria*

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-857.8960	NA	64069899	26.48911	26.58947	26.52871
1	-813.9550	82.47403	21874562*	25.41400*	25.81542*	25.57239*
2	-806.2276	13.79035	22794770	25.45316	26.15565	25.73034
3	-801.0710	8.726599	25781602	25.57142	26.57498	25.96739
4	-788.3852	20.29720	23225734	25.45801	26.76264	25.97277

When Table 3.5 is examined, the ideal lag length is determined as “1” according to FPE, AIC, SC and HQ information criteria.

3.4.3. VAR model

After determining the ideal lag length, the VAR model is established. According to the results of this model, how the variables affect each other was examined by taking into account the probability and coefficient values of the variables in the established models. A total of 3 different models were established, each variable being the dependent variable. On the other hand, since the ideal lag length is determined as "1", the first maximum lag value of each variable is included in the model as an independent variable. The mathematical equations of the 3 models established in the study are given below.

Current Account Balance= C(1)* Current Account Balance (-1) + C(2)* Energy Import (-1) + C(3)* Economic Growth (-1) + C(4)

Energy Import= C(5)* Current Account Balance (-1) + C(6)* Energy Import (-1) + C(7)* Economic Growth (-1) + C(8)

Economic Growth= C(9)* Current Account Balance (-1) + C(10)* Energy Import (-1) + C(11)* Economic Growth (-1) + C(12)

Table 3. 8. *Coefficient Statistics of VAR Model*

Model	Dependent Var.	Independent Variable	Indp. Var. Symb.	Coefficient	Prob.
Model 1	Current Account Balance	Current Account Balance (-1)	C(1)	-0.163967	0.1218
		Energy Import (-1)	C(2)	**-3.165632**	**0.0005***
		Economic Growth (-1)	C(3)	**6.277376**	**0.0169***
		Constant 1	C(4)	**-47.87880**	**0.0068***
Model 2	Energy Import	Current Account Balance (-1)	C(5)	0.013268	0.3046
		Energy Import (-1)	C(6)	0.109053	0.9330
		Economic Growth (-1)	C(7)	-0.193263	0.5518
		Constant 2	C(8)	**5.752951**	**0.0081***
Model 3	Economic Growth	Current Account Balance (-1)	C(9)	-0.004286	0.1810
		Energy Import (-1)	C(10)	-0.002755	0.9189
		Economic Growth (-1)	C(11)	**0.676746***	**0.0000***
		Constant 3	C(12)	**1.567363***	**0.0035***

In the first model, it is concluded that Energy Import (-1), Economic Growth (-1) and constant 1 variables are significant. Since the coefficient of energy import (-1) is negative, it is stated that the increase in the 1 previous periods of the energy imports decreases the current account balance. On the orher hand, an increase in the 1 previous periods of the economic growth increases the the current account balance. In the second model, it is concluded that only the constant variable is significant and the effect of constant variable is positive. In the third model, it is concluded that the variables of Economic Growth (-1) and Constant 3 are significant. Since the coefficient of the Economic Growth (-1) variable is positive, it is stated that the increase in the previous period data of economic growth and increase economic growth.

3.4.4. VAR stability conditions and residual diagnostics

Stability of the VAR system implies Stationarity. In the literature, stability condition is also referred to as “stationarity conditions”. If all inverse roots of the characteristic AR polynomial have modulus less than one and lie inside the unit circle, it means that the estimated VAR is stable. In case that the VAR is not stable, diverse tests conducted on the VAR model may be invalid. Moreover, impulse response standard errors are not valid. Here is the AR roots graph of our model;

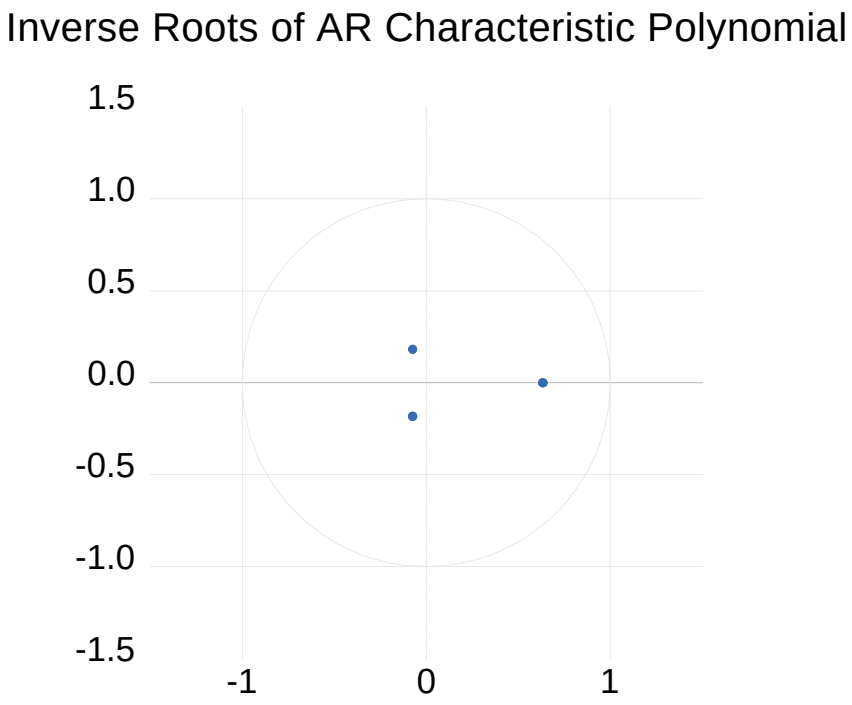

Figure 3. 2. *Inverse Roots of AR Characteristics Polynomial*

As seen on the figure, all inverse roots of the characteristic AR polynomial have modulus less than one and lie inside the unit circle. So, our VAR model is stable.

3.4.5. Autocorrelation and heteroskedasticity tests

In order to continue the analysis with this VAR model, the model should not have autocorrelation and heteroscedasticity problems. LM statistics were used for autocorrelation test and White test was used for heteroscedasticity analysis. The results of the LM test performed to determine whether there is autocorrelation and the White test to determine whether there is a heteroscedasticity problem are given in the tables below.

Table 3. 9. *Autocorrelation LM Test*

Lags	LM-Statistics	Probability
1	8.690763	0.4665
2	7.631397	0.5717

Table 3. 10. *VAR Residual Heteroskedasticity Test*

Chi-sq	df	Prob.
78.19652	36	0.0001

3.4.6. Granger causality test

The Granger causality test is a causality test used to determine whether there is causality between any two variables, and if there is, what is the direction of this causation. For variables that were previously determined to be stationary, 1 lagged causality models were created and the analysis was carried out. The results of the Granger causality analysis applied are shown in the table below. The test of causality examines if lagged values of one variable helps to predict other variables in the model. Here the null hypothesis H_0 states that "X does not Granger cause Y" and the alternative hypothesis H_1 states that "X does Granger cause Y".

Table 3. 11. *Granger Causality Test*

H_0 Hypotheses	Prob.	Decision
Energy import does not Granger cause current account	0.0004	Reject H_0
Current account does not Granger cause energy import	0.3566	Do not Reject H_0
Economic growth does not Granger cause current account	0.0176	Reject H_0
Current account does not Granger cause economic growth	0.1864	Do not Reject H_0
Economic growth does not Granger cause energy import	0.5331	Do not Reject H_0
Energy import does not Granger cause economic growth	0.9600	Do not Reject H_0

When the analysis results are examined, there is a one-way causality from the energy imports and the economic growth to current account deficit. Accordingly, the energy import variable is the Granger cause of the current account balance variable. Therefore, if a change occurs in the current account balance, energy imports are the cause of this change. Another conclusion about the current account balance variable is that economic growth is also the Granger cause of the current account balance. Therefore, if there is a change in the current account balance, economic growth is the reason for this change.

3.4.7. Impulse response functions

Impulse-response graphs should be examined during the more detailed interpretation of the variables in the VAR model. Impulse-response analysis was conducted within the scope of the VAR model given in the study. The method used in obtaining impulse-response is the Cholesky decomposition method.

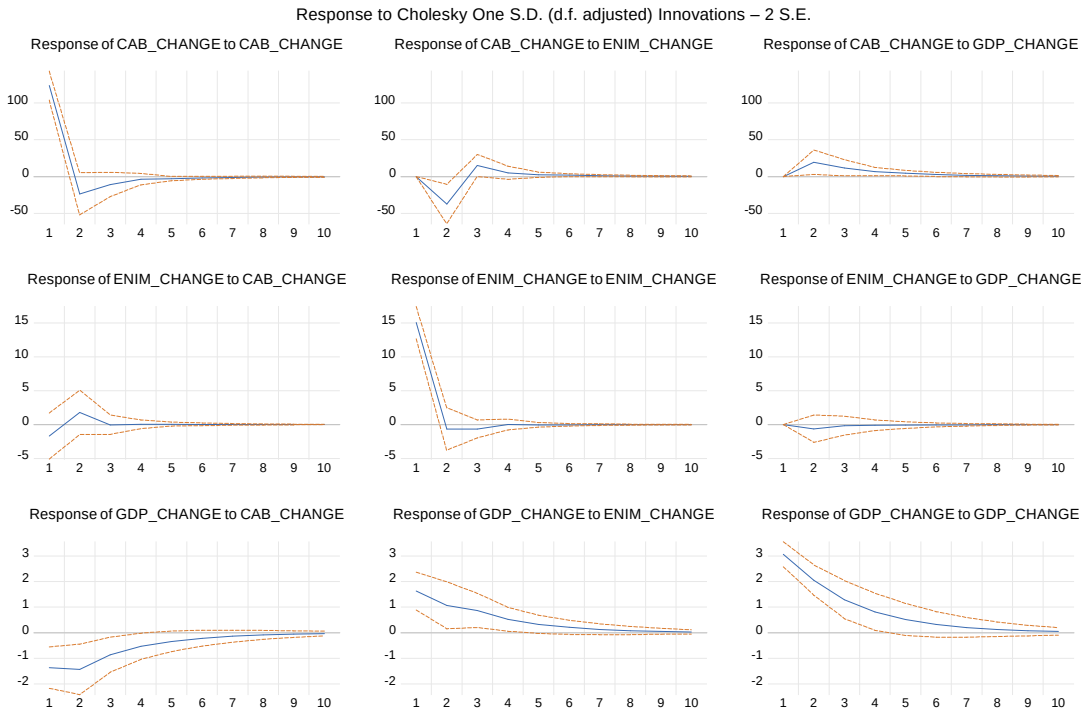

Figure 3. 3. *Impulse-Response Functions*

With the help of impulse-response functions of VAR models, the effect of one standard error shock on another variable can be seen. Current account balance give a meaningful response in the first 2 quarters to a one standard deviation shock on energy imports and economic growth. In addition, the results show that the effect of the shock occurring in the current account balance on energy imports continued for about 2 periods, and then gradually lost its effect.

3.4.8. Variance decomposition

Variance decomposition expresses the sources of shocks occurring in the variables themselves and in other variables as a percentage. It shows what percentage of a change

that will occur in the variables used is caused by itself and what percentage is caused by other variables.[185] In the study, variance decomposition tests were applied within the scope of the VAR (1) model, and ten-period results were obtained for three variables used in empirical practice.

Table 3. 12. *Variance Decomposition of Variables in the VAR Model*

	Variance decomposition of Current Account Balance			**Variance decomposition of Energy Import**			**Variance decomposition of Economic Growth**		
Period	Current Account Balance	Energy Import	Economic Growth	Current Account Balance	Energy Import	Economic Growth	Current Account Balance	Energy Import	Economic Growth
1	100.00	0.00	0.00	1.27	98.72	0.00	13.33	19.05	67.61
2	89.90	7.97	2.12	2.63	97.20	0.16	18.33	17.79	63.87
3	88.17	8.99	2.82	2.62	97.19	0.17	18.98	18.60	62.40
4	87.83	9.10	3.06	2.62	97.18	0.18	19.17	18.78	62.03
5	87.72	9.11	3.16	2.62	97.18	0.18	19.26	18.84	61.89
6	87.67	9.12	3.20	2.62	97.18	0.18	19.29	18.87	61.83
7	87.65	9.13	3.21	2.62	97.18	0.18	19.30	18.88	61.81
8	87.64	9.13	3.22	2.62	97.18	0.18	19.30	18.88	61.80
9	87.64	9.13	3.22	2.62	97.18	0.18	19.31	18.88	61.80
10	87.63	9.13	3.22	2.62	97.18	0.18	19.31	18.88	61.79

According to the variance decomposition of current account balance presented in the table; All of the shocks in the current account balance in the first period are explained by itself. Although this high explanatory power of the current account balance decreases in the following periods, it maintains its importance. Approximately 3.22% of the one unit shock occurred in the current account balance at the end of the tenth period was explained by the economic growth rate while 9.13% was explained by energy imports.

According to the variance decomposition of energy imports given in the table; 98.72% of shocks in energy imports in the first period were explained by itself. Explanation power of the current balance starts to increase in the following periods, albeit a little. At the end of the tenth period, 2.62% of the one unit shock in energy imports was

[185]S. Barışık ve F. Kesikoğlu (2006). *Türkiye'de Bütçe Açıklarının Temel Makro Ekonomik Değişkenler Üzerine Etkisi (1987-2003 VAR, Etki-Tepki Analizi, Varyans Ayrıştırması*. Ankara Üniversitesi SBF Dergisi, 61(4), s. 70.

explained by the current account balance while 0.18% was explained by economic growth.

According to the variance decomposition of economic growth given in the table; Most of the shocks in economic growth in the first period are explained by itself. The explanatory power of the current account balance starts to increase in the following periods. At the end of the tenth period, approximately 19.31% of the one unit shock in economic growth was explained by the current account balance and 18.88% by energy imports, while 61.79% was explained by itself.

CONCLUSION AND EVALUATION

The current account deficit problem in Turkey has become a chronic macroeconomic problem for many years. One of the biggest factors in the chronicity of current account deficits is undoubtedly high energy imports. Along with the industrialization, growing population, and the widespread use of energy, Turkey like many developing countries has taken its place among energy importers to meet the significant increase in energy demand and in order to keep welfare high. At the same time, energy is indispensable for economic growth, as it is one of the main inputs of production. The increase in Turkey's energy need in production and the fact that energy resources could not meet this need made Turkey dependent on foreign energy in terms of energy. This situation puts economic growth, current account deficit, and energy imports into a deadlock cycle. In this context, the energy reserves discovered and likely to be discovered in the Eastern Mediterranean create an opportunity for Turkey. However, the global competition in the region shapes the policies of many countries, including Turkey.

In this study, in order to examine the relationship between current account deficit and energy import and growth in Turkey, it is aimed to reveal whether energy import and growth cause current account deficit by using econometric analysis methods. For this purpose, the VAR model was established using the quarterly data of Turkey between 1999 and 2020, and through this model, Granger causality test, analysis of impulse response functions, and variance decomposition were made. In this context, ADF and PP unit root tests were applied in order to examine whether the series are stationary or not, and it was determined that they were stationary at the level of all the series. Afterward, an autocorrelation test was carried out and the analysis was continued, determining that there was no autocorrelation problem in the model.

Causality analysis was conducted in the empirical part of the study. A one-sided causality has been found from the energy imports and economic growth to current account balance. Accordingly, increases in energy imports and economic growth cause an increase in the current account balance. Then, variance decomposition tests were applied to measure the explanatory power of variables on each other. Accordingly, 9.13% of a change in the current account deficit is explained by energy imports and 3.22% by economic growth. In addition, 18.88% of the change in economic growth is due to energy imports and 19.31% from current account deficit. At the same time, 2.62% of a change in

energy imports is explained by the current account deficit and 0.18% by economic growth.

In the light of these data, Turkey's spending billions of dollars on energy every year has a direct impact on foreign trade deficits and poses a risk for energy supply security. The energy resources to be discovered in the Eastern Mediterranean mean that Turkey will have a healthy growth model in terms of keeping the high amount of foreign currency flowing abroad every year and directing this money to domestic investments, R&D studies, and technological developments. It is also possible that the cost advantage in energy-intensive sectors will be reflected in prices and, thanks to domestic energy generation, prices will be less affected by the exchange rate effect and developments in the world. On the other hand, Turkey, which has the advantage of being an energy transit country thanks to its strategic location between energy producer and consumer countries, has a critical importance in transporting the energy resources to be discovered in the region to European countries that want to get rid of Russia's dependency. Therefore, hydrocarbon resources to be discovered in the Eastern Mediterranean constitute an important opportunity for Turkey. In this context, Turkey should resolutely continue its just struggle in the Eastern Mediterranean and protect its rights arising from international law to the end. And, Turkey should use potential energy discoveries as a stepping stone in the transition to renewable energy.

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