

## **The Impact of Turkey's Natural Gas Distribution Tender Process on the Current Deficit**

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### **Abstract**

The main factors that increase the energy demand of countries are the rate of ownership of energy resources and their level of development. Since Turkey is a developing country and does not have sufficient energy resources, it is a net foreign-dependent country in energy. In this study, the factors that increase the natural gas demand in Turkey due to the neo-liberal economic policies implemented in the recent period and the effects of the increasing demand on the balance of payments are examined. Turkey's natural gas distribution tenders in recent years have further increased the foreign dependency ratio in energy, which is already at a high level. To make the economic development sustainable, it is of great importance to ensure the current account balance, which is the most important item in the balance of foreign payments. The demand for natural gas, which is one of the most important import items of Turkey, which aims to develop in the economy, cannot be met by domestic resources, so the balance of payments is adversely affected. With this study, it has been revealed that there is a causal link between the increasing natural gas demand in our country and the current account deficit, which cannot be closed.

**Key words:** Regulatory Government, Energy Demand, Natural Gas Imports, Balance of Payments

**JEL Code:** L95, Q41, Q48

### **1. Introduction**

The needs are increasing in parallel with the increasing world population with the existence of humanity. As a result of the development of the economy, the growth of industry and technology, and the neo-liberal economic policies implemented in the globalizing world in the post-1970 period, due to their

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increasing responsibilities, states began to be insufficient in dealing with many problems after a point, and the understanding of the social state was replaced by the understanding of the regulatory state. Since some public services have started to be performed by the private sector, the need for supervisory and regulatory institutions that did not exist before in the organization of the state has increased, thus new concepts and new institutions have entered our lives. Institutions that carry out these activities first emerged in the United States in the 19th century and began to spread in Europe in the 20th century.

In this process, the Capital Markets Board was established for the first time in Turkey in 1980, and then other supervisory and regulatory institutions such as the Energy Market Regulatory Authority began to be established. The last among these institutions was the Public Procurement Authority in 2002 (Tan, 2002).

Especially since the 1980s, many European countries have transferred state-owned services such as electricity, water, telephone, and natural gas to the private sector through tenders.

Between 1984-1991, England privatized telecommunications, gas supply, water, electricity generation, transmission, and distribution by ending the state ownership that has been going on for years, in order to reduce the state's economic and social efficiency. It has also established regulatory bodies for each sector to reduce the political pressure on the privatized sectors (Kızılcık, 2002).

The 1990s encompasses a period in which the transition from the liberalization (deregulation) period to the regulation period was made, in which the capital was paved, the state shrunk enough, and the political environment in which the private sector was comfortable became suitable for the new order to be fully established (Zengin, 2004).

Turkey followed a closed economic policy until 1980. After this date, Turkey has implemented an action plan suitable for the free market economy, which is the dominant conjuncture of the world at that time, to eliminate the practices that distort resource distribution and prevent competition, and to integrate with international markets (Aktel, 2003). The establishment of regulatory and supervisory institutions needed to achieve this goal has been initiated by giving priority to key sectors. The leading areas and sectors such as energy, agriculture and communication, which are in the hands of the public, and which are transferred to the private sector, for which the need for advanced technology applications is felt, such as national arbitration, control of capital markets, banking sector, competition law and public procurement regulations come first among these. The need for independent regulatory and supervisory institutions is also critical, as the consequences of the privatization process narrow the public sphere (Özen & Günay, 2004).

After the January 24, 1980, decisions, Turkey entered the period of opening up and privatization. In this period when the neo-liberal current of thought is

dominant in the world, the intervention of the state, which is primarily responsible for the bad course in the economy, will be minimized with privatizations as a result, all economic units will operate under market conditions, economic growth and economic development will be inevitable (Çelik, 2004).

The development of financial infrastructure and energy consumption have a very important place in achieving a sustainable and high level of economic development. With the economic growth, the need for known energy sources has increased, so the demand for oil, natural gas and coal has increased. Increasing demand has caused Turkey to allocate a larger share of its gross domestic product to these resources, as is the case in energy-poor countries, thus increasing its dependence on foreign energy. Because the distribution of energy resources in the world is not homogeneous, energy imports and total foreign exchange expenditures of countries with scarce energy resources such as Turkey have increased, and the balance of foreign payments of the countries has given a deficit. The aim of this study is to examine the effect of natural gas, which is one of the most important energy resources needed together with the demand for economic growth after the liberalization period, on the balance of payments.

The study consists of four parts. In the first part, the concept of energy and its derivatives; in the second part, the relationship between the energy need made compulsory by economic growth, the present and the future of the world's energy need; in the third part, the world energy consumption of natural gas and its place in Turkey, the contribution of the tenders made by the Energy Market Regulatory Authority to natural gas consumption; In the fourth chapter, the effect of the energy need forced by economic growth on the balance of payments and the share of natural gas will be included, and the study will be completed with the results and evaluations.

## **2. Energy Concept**

Energy is one of the basic requirements of social and economic development. Energy, which constitutes the most important input of production activity, is one of the basic elements of production of goods and services. Almost every production area needs energy. This situation puts the nations that have insufficient energy resources or that do not have sufficient resources, but have technological means, in the category of energy importing countries. For this reason, it is of great importance for countries to have sufficient energy resources in terms of economic development and development rates.

Energy resources, which are the most important inputs of the industrial industry, have three important features. The first of these features is that it is scarce, the second is that it is not equally distributed on the earth, and finally, it causes environmental pollution in the process due to the wastes generated because of its use (Çelebi Boz, Çınar & Temelli, 2017).

The scarcity of energy resources also causes these resources to be expensive in accordance with the law of scarcity. Despite the rapid increase in the world population, the energy resources do not increase at the same level, which further increases the value of the already scarce energy resources. In addition, the non-homogeneous distribution of energy sources around the world makes countries with energy resources more powerful and important in terms of economy and strategy. However, it also makes countries that do not have sufficient resources in terms of energy supply dependent on countries with energy resources and causes an important capital transfer between these countries in terms of international trade.

Energy supply and demand maintains its place on the agenda as an important field of study due to the direct or indirect effects they have on the economy, industry, and social structure. There is an inevitable relationship between energy consumption, which is the result of economic growth, and development. For this reason, the effect of the cost of energy demand on the current account balance, especially in the economies of developing countries, is extremely important. For a rapid and sustainable growth, the storage and sustainability of energy is of great importance. Energy is the driving force of economic growth and development (Aydın,2010).

Steam engines found at the end of the 18th century paved the way for mass production in the industrial sector from the beginning of the 19th century, because of which large-scale production was discovered. With this development, which entered the world political history as the Industrial Revolution, the energy needs of countries increased rapidly, and many wars broke out for energy supply security (Arslan &Demirağ, 2017).

We can examine the energy sources that cause many wars in the world under two headings as primary and secondary energy sources.

## **2.1 Primary Energy Sources**

Nuclear energy, also called non-renewable energy, oil, natural gas and coal are among the primary energy sources. Of these, oil has a wide range of uses in many industries, especially in the transportation sector and industry. Petroleum, whose derived products such as asphalt, paraffin, naphtha, tar, diesel oil, and gasoline are used in industry and industry, has a share of nearly 40% in world energy use.

Petroleum and natural gas, which are like each other in terms of their extraction from nature and their effects on social life, have always had a strategic importance in international politics in terms of the country of origin and the countries on the distribution corridors. Due to this feature, the subject is sometimes considered among the basic subjects of the discipline of international relations and sometimes of the discipline of international economics.

However, petroleum and petroleum-derived products have entered the field of interest of environmental and climate policies in terms of the damage they cause to the environment.

The second energy source is coal. Coal, which has many uses in daily life, is used to obtain steam in many industries such as electricity production, iron-steel, and cement production, apart from the purpose of heating. 33% of the energy consumed worldwide is met by coal. Coal is the first fossil fuel found in the world. Coal is a reliable energy source that can be obtained at low costs. It is an energy source with a relatively homogeneous distribution, which can be found not only in certain regions but also in almost all countries on earth. Coal has always been in the foreground compared to other energy sources until the middle of the 20th century due to the ease of reserve determination studies and the fact that extraction and processing operations do not require high technology.

The demand for natural gas, whose extraction process is like oil, is constantly increasing. Natural gas, like oil, has a wide range of uses, especially in housing and industry. In recent years, the use of natural gas in the production of electrical energy has made natural gas one of the main energy sources. The fact that it has high energy efficiency, has minimal environmental damage, is cheaper than its alternatives, has eliminated the transportation problem especially in domestic use, and has lower maintenance-repair and operating costs in the industry compared to its equivalents, has increased the demand for natural gas. Natural gas alone provides 25% of the world's energy consumption.

Among the fossil energy sources, natural gas is among the most preferred sources because it is easy to produce compared to oil, has high energy efficiency and does not require refining. Nuclear energy is another non-renewable energy source. Nuclear energy, which started to be used in the 1950s, is an energy source that is mostly preferred in electricity production because it provides continuity in production due to its ability to work independently of climate and weather conditions. In addition, nuclear energy is used in the defense industry and health sector.

Nuclear energy provides more energy than oil, natural gas and coal. Namely, While 3 kWh of energy is obtained from 1 kg of coal, 4 kWh of electrical energy is produced from 1 kg of oil, 50 000 kWh of electrical energy is produced from 1 kg of uranium (TAEK, 2000).

Nuclear power plants, which do not cause environmental pollution while producing energy, carry significant risks because the effects of accidents can last for many years and can affect a very large area.

On the other hand, the high cost of the installation of nuclear power plants, the difficulty of determining the places where they will be installed, and the need for high-cost technology are among the disadvantageous features. Approximately

12% of the energy consumed in the world is obtained from nuclear energy (Apergis, Payne & Menyah vd., 2010).

Nuclear energy is the most prominent energy source in combating air pollution among renewable energy sources.

Although this is the case, it can be said that renewable energy sources provide significant advantages in reducing the vulnerability of countries that are dependent on foreign energy against fluctuations in energy costs, in combating inflationary pressures in the domestic economy, and in making national economies more resilient against external shocks (Panvara, Kaushik & Kotharia, 2011).

## **2.2 Secondary Energy Sources**

Urbanization, industrialization, and the needs of the increasing population constantly increase the energy need in the world, especially in developing countries. At this point, the important thing is the continuity of the supply security of the increasing energy demand. However, it is much more important that the demand can be met at low costs and completely.

Due to the high cost of accessing and using secondary energy resources, which are called non-renewable energy resources, and the high cost of these costs creating significant pressure on the current account deficit and damaging the environment, especially developed countries have directed their attention to secondary energy resources that will be an alternative to these resources. Renewable energy consists of energy sources that are constantly present in nature and do not run out once used.

Renewable energy sources, besides their great contribution to the protection of the environment, make an important contribution to reducing foreign dependency in energy by offering resource diversity. The most important disadvantage is that the initial investment costs of renewable energy sources are quite high compared to non-renewable energy sources. However, operating costs are low.

Renewable energy sources lead important R&D studies in the country as they require advanced technology. Investments to be made in renewable energy resources, especially in rural areas of developing countries, make an important contribution to the solution of the employment problem, which is the main problem of these regions (Shen, James & Lin, 2011).

It is expected to meet the basic objectives such as providing energy from secondary energy sources and providing the promise of not polluting the environment (Şekercioğlu & Yılmaz, 2012).

Secondary energy resources, as in primary energy resources, will provide the countries that have some advantages in this regard, the right to use the power

they have gained due to the competitive power they give in energy in international politics (Kulali, 1997).

### **3. The Relationship Between Economic Growth And Energy**

Countries with rich energy resources want to use these resources in a way that will provide the highest income, while countries that are importers want to reach energy resources with the lowest cost. In the energy markets, there is a delicate balance between the demand for energy and the energy supply. From a global perspective, since the demand for energy cannot rise suddenly under normal conditions, there is a planned production. Therefore, energy prices are under control at this stage. The price of energy, which is one of the basic inputs of the economy, is one of the important indicators of the general economic conjuncture. The effects of energy prices on the macroeconomy are long-lasting. For a sustainable economic growth, it is vital to provide energy from reliable sources uninterruptedly and at affordable costs. The desire of many countries to own and/or control the energy resources they need in the world economy also makes energy an indispensable political tool.

Creating resource diversity in energy supply, having reliable and continuous energy resources is a phenomenon that makes countries in the process of growth and development stronger geopolitically.

The fact that there is an indispensable relationship between almost all fields of activity of the economy and energy shows that there is a close relationship between energy use and economic growth. In addition, while efficiency in energy consumption increases growth through investments, growth increases energy efficiency with the effect of economies of scale. Since each energy source requires a separate technological investment, it affects growth positively. However, the intensity of the said relationship differs from country to country according to the development level of the countries. While the relationship between energy demand and economic growth in developing countries is extremely strong, it is seen that the said relationship is weaker in developed countries. In other words, the elasticity coefficient between the amount of energy consumed and the increase in GNP is generally lower than 1 in developed countries and higher than 1 in developing countries. One of the important factors affecting the elasticity coefficient is energy density. Energy density shows the amount of energy used per unit output. Energy density is a tool used to measure energy efficiency. Energy intensity is higher in developing countries compared to developed countries. In developing countries, more energy is consumed as the rate of industrialization increases. However, in these countries, the fact that efficient technological infrastructure and equipment cannot be used in the production, transmission and consumption of energy, and also that the service sector is not developed enough, increases the energy consumption per unit output, in other words, the energy density. For this reason, there are

additional increases in energy demand in developing countries, since there is no efficient use of energy compared to developed countries (Seyidođlu, 2015).

Energy importing countries are faced with an inflationary result in their domestic markets as their production costs increase due to the increase in energy costs. This result is felt more especially in developing countries that try to close their savings deficits through borrowing. Rising energy import costs force governments to implement contractionary fiscal policies, while current inflationary pressure causes general demand to be curtailed. As a result, the total expenditures in the economy decrease, and the decreased expenditures lead to recession and unemployment. Meanwhile, as prices continue to rise despite the economic recession, consumers' confidence in the markets is shaken, and the current negative effects are growing exponentially.

Since it is not possible for these countries to reduce their energy consumption at the same rate as energy prices increase, the ratio of energy expenditures in national income increases while the ratio of other expenditures decreases. The increase in energy prices also affects the international trade balance. The increase in energy costs deteriorates the balance of payments of net energy importing countries and decreases their real national incomes. This situation causes the contraction of world trade and then the recession in the global economy. Since the countries that started to have external deficits restrict their imports, they affect the exports of other countries and thus their economic growth negatively.

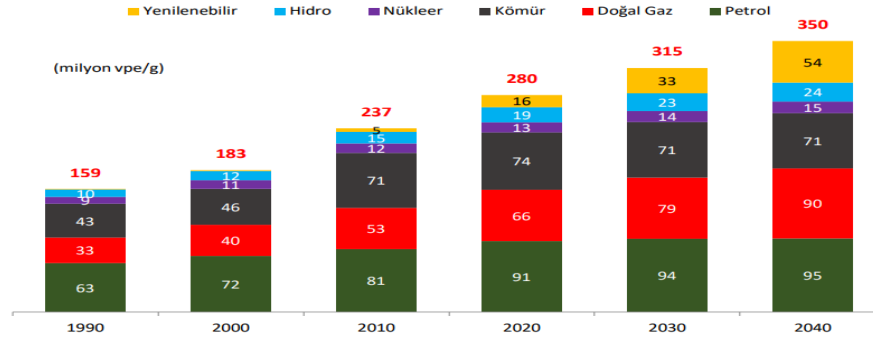
In summary, the chain process that started with an increase in energy prices includes the danger of dragging the world economy into a total recession and unemployment along with inflation. Meanwhile, if the governments do not change their monetary policies in the country, the exchange rate rises and this situation causes the current account deficits of the countries to increase.

### **3.1 The Future of World Energy Consumption**

In the 21st century, it has become one of the most basic needs of modern life and has been the most important resource used in almost all stages of energy, agriculture, industry, and services sectors. Today, according to the projections made by various international organizations such as the International Energy Agency, Exxon Mobil, and British Petroleum, oil and natural gas will maintain its first place in energy consumption in the coming period, as it has done so far.



**Graph 1. Energy Resources**



**Source:** Turkish Petroleum Corporation Oil and Natural Gas Sector Report 2020 BP,2021

Although renewable energy sources are increasingly used due to their environmental advantages, only 12.5% of the energy used worldwide is made up of renewable and hydro energy sources, according to 2020 data.

While the energy consumed on earth is obtained from many sources, natural gas consumption in 2020 ranks third with a rate of 23.7% alone.

According to the projection, it is estimated that in 2040, energy consumption will increase from 280 million barrels of oil equivalent/day (vpe/g) to 350 million vpe/g, the share of renewable and hydro energy sources and natural gas will increase, and the share of others will decrease. In 2040, it is expected that the share of renewable and hydro energy in total consumption will increase to 22.3%, while the share of natural gas will increase to 25.8%.

According to long-term energy projections, it is expected that the global energy demand will increase by 50% in 2040, and the rate of use of oil, which is demanded by the transportation and transportation sector, will decrease to 3-4% in energy resources (Boratav, 2005).

It is known that the current reserve amount in the world is 188.1 trillion m<sup>3</sup> according to 2020 data of natural gas, the usage rate of which will increase. As a result of dividing this reserve by the current production amount of 3.85 trillion m<sup>3</sup>, it is calculated that the global natural gas reserve life is 48.8 years. It should be known that these reserves will increase with new discoveries thanks to developing technologies, but the calculated lifetime may change with the effect of increasing demand.

#### **4. The Effects of International Economic Developments on Turkish Policy**

As a result of the energy crisis in the world in 1974, oil prices increased very rapidly, which caused serious economic problems in Turkey. Thereupon, alternative energy sources have been researched to reduce oil consumption in Turkey, and accordingly, the importance of natural gas in economic activities has gradually increased. Natural gas production activity in Turkey was first carried out in Thrace in 1976, but the production was well below the total need.

In terms of the global energy outlook, the world is rapidly advancing towards becoming a single market. It is now seen that natural gas infrastructure connections have been switched to international open systems rather than serving only with a national closed system, with the effect of globalization thanks to developing technologies. To realize sustainable development, it is necessary to provide the energy needs of all units of the economy continuously and to establish a competitive liberalization approach in energy markets. This change is the result of the change in the understanding of economic policy experienced not only in Turkey but also throughout the world.

After 1980, Turkey entered a period of significant change with the pressure of socioeconomic factors. This change, carried out under the leadership of Turgut Özal, meant a change in the statist perspective, whose influence has increased from time to time and decreased from time to time since the establishment of the Republic. From this point of view, the neo-liberal economic policies followed 1980 and the attempts to liberalize the state structure to adapt to this policy show that there is a socio-political change in Turkey. During the said period, public administration was abandoned in some areas, the development strategy based on import substitution was abandoned, foreign exchange control was abolished, exports were encouraged while import restrictions were reduced.

The January 24, 1980, decisions were an important turning point for the integration of the Turkish economy with international capitalism and liberal economic policies. More importantly, it is the determination of the military political power that carried out the military coup of 12 September to implement neo-liberal policies including these decisions (Ataç, 1999).

The wave of change experienced in the field of economy and politics in Turkey in 1980 and after is not only related to the internal dynamics of the country, but also the effects of globalization, which started to increase in the same years. For this reason, the policies implemented should be seen as the result of Turkey's desire to adapt to the globalization process. With this result, Turkey did not break away from the global strategy change and the rise of neo-liberalism in the same period.

In this period, in most of the developed countries, the emergence of the great economic crisis after the oil crisis in the 1970s gave strength to the approaches aiming to minimize the role of the state in the economy.

The January 24 Decisions, whose primary objective was to provide foreign trade balance by encouraging exports, to prevent inflation and to ensure free market conditions in the economy, created a competitive environment in the country by opening the existing manufacturing industry sector and production structure, especially the tourism sector, to the outside Ener & Siverekli Demircan, 2004).

With the January 24 Decisions, interest rates were increased, and private sector supports, Central Bank advances and emission volume were reduced. By devaluing the Turkish Lira against foreign currencies, export earnings were excluded from taxation, value added tax incentives were provided to exporters and taxes on export credits were abolished. As a result of this policy change, the share of industrial products in exports increased, the volume of foreign trade increased, significant increases were experienced in the invisible transactions part of the balance of payments, black market price formation was prevented in the prices of goods and services, there were movements in foreign capital inflows and the manufacturing industry capacity utilization rates increased.

Despite all these developments, the target of reducing the share of the state in the economy, which is the basis of the program, could not be realized, and the market economy model that was tried to be adopted was not successful. The balance between public revenues and expenditures could not be achieved. The desired efficiency could not be achieved in the privatization of State Economic Enterprises. The increase in public expenditures, domestic and foreign debt stock caused the country to resort to central bank resources.

In the political, social, and economic history of Turkey, public revenues were increased from the beginning of 1980 until 1988, especially through taxes such as the newly introduced value added tax, but the low level expected in public expenditures could not be achieved and the state's weight in the economy continued. The problems experienced in terms of public finance caused an increase in domestic debts (Boratav, 2005).

Trying to complete the liberalization process with the January 24 Decisions, Turkey, because of the economic policies implemented, attained a fragile economic structure under the influence of short-term foreign capital flows in the early 1990s and became ready for the infrastructure of many crises. As a result, it was faced with crisis scenarios arising from similar reasons. This stress on the economy increased the general level of prices, deteriorated the foreign trade balance against exports, increased budget deficits and created the infrastructure for future crisis or crises in the economy as foreign debts became irreversible.

Then, on April 5, 1994, a new stabilization program was announced to get out of the crisis. While the short-term aim of this program was to stabilize the deteriorated external balance and foreign exchange markets, the medium-term aim

was to reduce the public deficits, end the instability in the financial markets, reduce inflation and ensure sustainable growth in the long run (Ataç, 1999).

In this process, consecutive crises occurred in November 2000 and February 2001, and the Transition to a Strong Economy Program, which was put into practice in the environment created by these crises, could not get out of the crisis environment (Ener & Siverekli Demircan, 2004).

It has been seen that this program, which has only an exchange rate policy difference from the previous programs in content, will not be able to get Turkey out of the recession in a short time. The exchange rate anchor policy increased foreign currency borrowing, short-term hot money inflows increased, and the balance of payments was adversely affected due to the increase in imports due to the inability of the Central Bank to take precautions (Eyüboğlu & Eyüboğlu, 2016).

Investors started to obtain funds from international markets after the atmosphere of trust provided by the new government coming to power after the 2002 election. With the prepared action plan, he made some legal arrangements and created economic stability in the country. In this context, harmonization with European Union Laws gained momentum, a Public Procurement Authority was established, and privatization efforts were accelerated. Thus, efforts were made to bring foreign capital to Turkey and to improve the investment environment. However, this privatization and efforts to attract foreign investors to the country have brought a new problem. As investors began to arrive, the country's energy need began to increase, and therefore, import rates began to rise.

With the first use of natural gas in 1987, there has been a new addition to Turkey's import items. The fact that natural gas provides a cheap and clean energy has increased the demand for it and this has brought an additional burden on the economy.

To meet the increasing energy demand, private sector investments were tried to be channeled into energy projects, and for this reason, desired results could not be obtained from new applications such as Build-Operate-Transfer, Build-Operate and Transfer of Operating Rights in large energy projects.

In this process, a very comprehensive restructuring process in the field of energy has started in Turkey. For this purpose, the "Electricity Market Regulatory Authority", which was established in 2002 with the Electricity Market Law, has turned into the "Energy Market Regulatory Authority" with the Natural Gas Market Law. With this change, important duties have been assigned to the Energy Market Regulatory Authority.

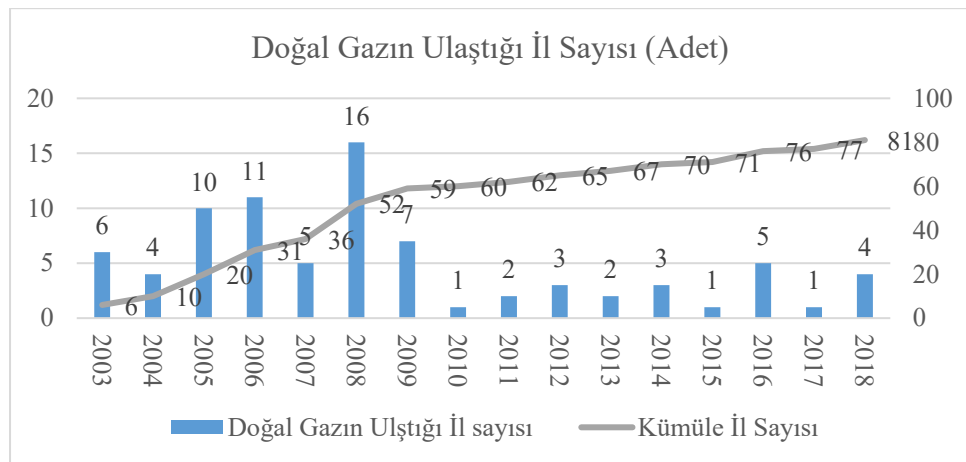
#### 4.1 Natural Gas Distribution Tenders Made by the Energy Market Regulatory Authority

The Energy Market Regulatory Authority, which has an administrative and financial autonomy, has started to establish regulatory procedures not only in the natural gas market, but also in the electricity, petroleum and liquefied petroleum gases market with the tenders it has made and the decisions it has taken.

The aim of the Authority regarding the natural gas market is to provide natural gas to consumers in a quality, continuous, cheap and environmentally friendly manner within the framework of competitive principles, to establish a natural gas market and to ensure an independent regulation and supervision in this market. In the natural gas market, the Authority is responsible for issuing licenses and certificates that define the import, transmission, distribution, storage, trade and export of natural gas and the rights and obligations of all real persons related to this activity, examining the market and system operation, arranging, amending and auditing secondary legislation for this purpose. is responsible and authorized to examine the inputs affecting the tariff and to ensure that the sector acts in accordance with the Natural Gas Market Law (EPDK).

Until 2004, natural gas was available only in Istanbul, Bahçeşehir, Ankara, Izmit, Adapazarı, Eskişehir and Bursa districts, which are city centers. Since 2004, the Energy Market Regulatory Authority has brought natural gas to all cities in Turkey with the tenders it has made in different years. In this context, the years in which cities started using natural gas according to the tenders made by the Energy Market Regulatory Authority are shown in the chart below.

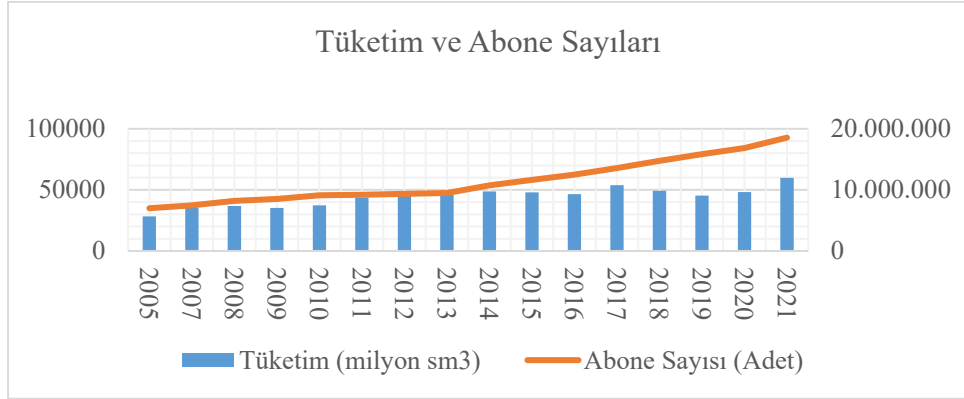
**Graph 2.** Number of Provinces Where Natural Gas Reaches



**Source:** Energy Market Regulatory Authority Natural Gas Sector Reports (2010-2021), Gazbir

As a result of the tenders, as of 2018, 81 provinces in Turkey have received natural gas. Thus, natural gas consumption increased in parallel with the number of users.

**Graph 3.** Consumption and Subscriber Numbers



**Source:** Energy Market Regulatory Authority Sector Reports

As of the end of 2021, the number of subscribers using natural gas was 18,553,703 and the natural gas consumed was 59,854 million sm<sup>3</sup>. Thanks to the natural gas distribution tenders made by the Energy Market Regulatory Authority, the fact that millions of final consumers, businesses, and free consumers who did not use natural gas before, started to consume natural gas, made the most important contribution to this increase.

Natural gas consumption in our country shows an upward trend in parallel with population growth because of the improvement in living standards due to urbanization and industrialization (Türkiye Petrolleri A.O. Petrol ve Doğalgaz Sektör Raporu, 2020).

Due to its limited underground wealth, Turkey is also a net importer of natural gas, another fossil resource. In Table 1, natural gas production and consumption amounts of Turkey by years are given. While the total amount of natural gas produced in Turkey in the last 20 years was 10,899 million sm<sup>3</sup>, consumption in the same period was 747,203 million sm<sup>3</sup>. When the production, consumption and import amounts for the last 20 years are evaluated together, it is seen that Turkey's natural gas production amount meets 1.5% of the consumption amount. This ratio shows that Turkey's import dependency ratio in natural gas is at the level of 98.5%. This result shows that natural gas imports have a significant share in the foreign trade deficit that Turkey has been giving for years.

**Table 1.** Turkey's Natural Gas Production and Consumption Amounts by Years

Years	Production (million sm <sup>3</sup> )	Imports (million sm <sup>3</sup> )	Import Dependency Rate (%)	Consumption (million sm <sup>3</sup> )	Consumption (million sm <sup>3</sup> )
2005	896	27.467	3,3%	28.363	7.153.679
2006	907	31.128	2,9%	32.035	7.314.197
2007	874	35.842	2,4%	35.394	7.474.715
2008	969	37.350	2,6%	36.865	8.201.256
2009	687	35.856	1,9%	35.218	8.512.677
2010	682	38.036	1,8%	37.411	9.109.088
2011	759	43.874	1,7%	43.697	9.200.000
2012	632	45.922	1,4%	45.242	9.350.000
2013	537	45.269	1,2%	45.918	9.484.324
2014	479	49.262	1,0%	48.717	10.758.400
2015	381	48.427	0,8%	47.999	11.636.400
2016	367	46.352	0,8%	46.481	12.496.511
2017	354	55.249	0,6%	53.857	14.755.011
2018	428	50.361	0,8%	49.329	14.755.011
2019	474	45.211	1,0%	45.286	15.865.809
2020	441	48.126	0,9%	48.261	16.846.604
2021	394	59.854	0,7%	59.854	18.553.703
<b>Total</b>	10.261	743.586	1,4%		

**Source:** Energy Market Regulatory Authority, Natural Gas Market 2021 Sector Report

Turkey produced 639 million sm<sup>3</sup> of natural gas in 2000 and imported 15,086 million sm<sup>3</sup> of natural gas.

Imports increased to 27,467 million sm<sup>3</sup> in 2005 due to increased consumption, especially because of the tenders made by the Energy Market Regulatory Authority after 2005. Imports reached its highest level in 2021, reaching 59,854 million sm<sup>3</sup>. The rate of change in natural gas imports from 2000 to 2021 was 309%.

The history of the natural gas market also determines the projections for the future. The worldwide consumption of natural gas is expected to increase rapidly and its usage area is expected to expand, and a similar expectation is valid for Turkey as well.

Since natural gas, whose usage area and number of users has increased rapidly, could not be produced in sufficient quantities to meet the need in Turkey, the balance of foreign payments of the countries that have increased their imports has been adversely affected.

## **5. The Effect of Energy Needs Made Essential by Economic Growth in Turkey on the Current Deficit**

The balance of foreign payments or balance of foreign payments is a calculation table that shows the status of the commercial, financial, and financial relations of the countries with the outside world in a year. The balance of foreign payments reveals whether the incomes obtained from abroad by countries through economic transactions such as goods, services and capital flows are equal to the payments made to other countries. You can tell whether a country's solvency is improving or deteriorating by looking at the balance or imbalance in the balance of payments (Seyidoğlu, 2003).

Countries carry out monetary transactions with each other in the thousands. The balance of payments shows similar transactions among these transactions under three headings. It is possible to classify these main accounts as current account accounts, capital and financing accounts and reserve movements accounts. These accounts are divided into four subgroups as current account, goods trade account, services trade account, investment income and current transfers (Ünsal, 2005).

The balance of payments is a table with a high reputation in the international economic field, consisting of sub-balance sheets such as the foreign trade balance sheet, the services balance sheet and the capital movements balance sheet. While equality is generally sought in the items that make up the balance sheet, these three items that make up the balance of payments do not have to be equivalent. However, there may be transitions among themselves to ensure the total balance created by these three items that make up the balance sheet (Altunöz, 2014).

**Table 2.** Total Import and Export

<b>Years</b>	<b>Total Imports (Billion USD)</b>	<b>Total Exports (Billion USD)</b>	<b>The Foreign Trade Deficit (Billion USD)</b>	<b>The Ratio of Exports to imports</b>
<b>2013</b>	260,82	161,5	-99,32	62%
<b>2014</b>	251,14	166,5	-84,64	66%
<b>2015</b>	213,62	151	-62,62	71%
<b>2016</b>	202,19	149,2	-52,99	74%
<b>2017</b>	238,72	164,5	-74,22	69%
<b>2018</b>	231,15	177,2	-53,95	77%
<b>2019</b>	210,35	180,8	-29,55	86%
<b>2020</b>	219,52	169,9	-49,62	77%
<b>2021</b>	271,42	225,2	-46,22	83%

**Source:** Turkish Statistical Institute



Turkey's total import and export figures from 2013 to 2021 are shown in Table 2. The amounts paid for natural gas imports are also included in the import figures.

The most important reason for the current account deficit, which is Turkey's chronic problem, is the distorted foreign trade balance. While our foreign trade deficit was 99.32 billion USD in 2013, the ratio of exports to imports was 62%. In recent years, it is observed that the foreign trade deficit has gradually decreased. Due to the increase in exchange rates in 2019, the foreign trade deficit was realized as 29.55 million USD. This result is one of the best results obtained in recent years. In 2021, the foreign trade deficit was realized as 46.22 billion USD. The most important effect on this result is that the rate of increase in exports is higher than the rate of increase in imports. Developing countries such as Turkey need energy, intermediate goods and investment goods in order to ensure their economic development, and since these needed inputs are imported, these factors are the main reason for the current account deficit (Bayraç & Aras, 2007).

Globally, the concentration of energy resources in certain geographies, on the one hand, increases the volume of international trade, on the other hand, it causes a resource transfer in favor of energy exporting countries against the energy importing countries due to the increases in energy prices.

The national income of energy exporting countries increases due to the increase in the prices of the products they sell. However, as a result of the economic stagnation in the countries that import the same product, the demand of the countries that are net energy exporters for other export goods, if any, decreases, and this reduces a part of the income obtained as a result of energy exports at high prices (Demir, 2013).

Especially in developing countries such as Turkey, high growth targets increase energy consumption and because of this increase, oil and natural gas import figures increase. If these countries do not have sufficient foreign currency inflows, they are faced with serious current account deficits (Yazar, 2010).

When the reasons for the current account deficit in Turkey are examined in detail, it is seen that the biggest item is energy. Since our country does not have sufficient oil and natural gas resources, the energy resources needed are met by importing to a large extent.

Despite Turkey's increasing and intense energy consumption, it is heavily dependent on oil and natural gas by not producing alternatives to replace it, and the fact that almost all this dependency has to be met from outside, which increases energy imports and thus the deficit in the current account balance. This process undoubtedly keeps the development goal of our country under constant pressure in the current account deficit window. This pressure can only be brought under control by exporting products that require less energy.

Since Turkey meets 65% of its energy needs by importing, it is known that energy imports are primarily effective in the cause of the current account deficit. Turkey's regular growth rate has also led to an increase in energy imports.

While high growth figures increased the energy demand, the use of energy, which is dependent on non-existing natural gas and oil, constantly put pressure on the current account deficit through energy imports. The financing of growth, which is the problem of many of the developing countries, has always kept its place on the agenda in Turkey as well, and as a result of the policies implemented, it has either emerged as a cost factor with high inflation or has created high current account deficits as in the last period.

### **5.1 The Effect of Natural Gas Imports on Current Account Balance**

Natural gas is the most important type of energy used at every stage of daily life and in many production processes. Turkey meets 30% of its energy needs from natural gas and its derivatives (Gürbüz, 2012).

Turkey is not a country rich in natural gas reserves. However, due to its geographical location, it is neighbor to many countries rich in natural gas reserves. This situation makes it easier for Turkey to meet its natural gas needs and increases the import figures.

According to the data obtained from the 2021 Sector Report of the Energy Market Regulatory Authority; "In 2021, 58.7 billion  $\text{sm}^3$  of natural gas was imported. Natural gas imports increased by 21.98% compared to 2020. In 2021, imports were mostly made from Russia with a share of 45%" (Çiğdem, 2016).

In 2021, 14.1 billion  $\text{sm}^3$  of liquefied natural gas was imported. The amount in question constitutes 24% of the total imports.

Natural gas import contracts are contracts made for long periods such as 10-25 years, and the reason why they are made for a long time is to ensure demand security for the seller and supply security for the buyer. For this reason, the supply price of natural gas is determined by contracts with imported countries and they have different pricing policies. Natural gas import unit prices, which are known to be long-term contracts, are known as 275 USD / 1000  $\text{sm}^3$  to 300 USD / 1000  $\text{sm}^3$ . According to these data, while Turkey paid USD 10.9 billion abroad for natural gas imports in 2010, it paid USD 16.88 billion in 2021.

**Table 3.** Natural Gas Imports

<b>Years</b>	<b>Amount of Imported Natural Gas (Billion Sm<sup>3</sup>)</b>	<b>Lowest (USD/1000 Sm<sup>3</sup>)</b>	<b>Highest (USD/1000 Sm<sup>3</sup>)</b>	<b>Average Price (USD/1000 Sm<sup>3</sup>)</b>	<b>Natural Gas Import Paid (Billion USD)</b>
<b>2010</b>	38.036	275	300	287,5	10,94
<b>2011</b>	43.874	275	300	287,5	12,61
<b>2012</b>	45.922	275	300	287,5	13,2
<b>2013</b>	45.269	275	300	287,5	13,01
<b>2014</b>	49.262	275	300	287,5	14,06
<b>2015</b>	48.427	275	300	287,5	13,92
<b>2016</b>	46.352	275	300	287,5	13,33
<b>2017</b>	55.250	275	300	287,5	15,88
<b>2018</b>	50.282	275	300	287,5	14,46
<b>2019</b>	45.211	275	300	287,5	13
<b>2020</b>	48.126	275	300	287,5	13,84
<b>2021</b>	58.704	275	300	287,5	16,88

**Source:** Energy Market Regulatory Authority

Turkey met its increasing natural gas demand with imports. If Turkey could provide the natural gas it needs with its own internal resources, the foreign trade balance would decrease and the ratio of exports to imports would increase. When the money paid for natural gas is included, the foreign trade deficit was 46.22 billion USD in 2021, while if it had supplied natural gas with domestic resources, the foreign trade deficit would have decreased to 29.34 billion USD. In other words, the share of the money paid for natural gas imports in the foreign trade deficit in 2021 is 37%.

**Table 4.** The Effect of Natural Gas Imports on the Trade Deficit (%)

<b>Years</b>	<b>Natural Gas Imports (Billion Dollars)</b>	<b>Energy Imports (Billion Dollars)</b>	<b>Total Imports (Billion Dollars)</b>	<b>Total Exports (Billion Dollars)</b>	<b>Foreign Trade Deficit (Billion Dollars)</b>	<b>Foreign Trade Deficit Excluding Natural Gas (Billion Dollars)</b>	<b>The Effect of Natural Gas Imports on the Trade Deficit (%)</b>
<b>2013</b>	13,01	55,90	260,82	161,50	-99,32	-86,31	-13%
<b>2014</b>	14,16	54,90	251,14	166,50	-84,64	-70,48	-17%
<b>2015</b>	13,92	37,80	213,62	151,00	-62,62	-48,70	-22%
<b>2016</b>	13,33	27,20	202,19	149,20	-52,99	-39,66	-25%
<b>2017</b>	15,88	37,20	238,72	164,50	-74,22	-58,34	-21%
<b>2018</b>	14,46	43,00	231,15	177,20	-53,95	-39,49	-27%
<b>2019</b>	13,00	41,20	210,35	180,80	-29,55	-16,55	-44%
<b>2020</b>	13,84	41,50	219,52	169,90	-49,62	-35,78	-28%
<b>2021</b>	16,88	50,70	271,42	225,20	-46,22	-29,34	-37%

**Source:** Energy Market Regulatory Authority, Turkish Statistical Institute, Compilation

Current account deficit is a chronic economic problem in Turkey. Looking at the natural gas foreign trade balance of Turkey for the last 9 years, it is seen that the payments made for natural gas imports have an effect between 13% and 44%, and 26% on average, on the foreign trade deficit. It is observed that the share of natural gas imports in the foreign trade deficit is due to the increased consumption in parallel with the needs of the cumulative increase in the number of consumers due to the natural gas distribution tenders.

Turkey's current account deficits have increased continuously, except during crisis periods. Increasing fossil energy input demand due to economic expansion and production increase also increases energy imports. This makes the current account deficit arising from the increase in energy imports inevitable. It is seen that Turkey's current account balance has been faced with a deficit for years, especially in the crisis periods of 1994 and 2001. The reason for the current account surplus in these periods is because of the devaluations on foreign trade (EPDK).

The main reason for Turkey's current account deficit is due to energy imports. As the demand for energy, which is necessary for economic growth, increases, the current account deficit also increases. This deficit will be overcome by abandoning the production model based on imported inputs and reducing external dependence on energy (Teletar, 2011).

## 6. Conclusion

In terms of the Turkish economy, one of the most important economic problems of today is its dependence on foreign energy. In this study, from the emergence of Turkey's natural gas need to the changes brought about by this need; The changes in the current account deficit caused by the importation of natural gas and the payments made for imports, and their consequences are mentioned.

Natural gas, which is one of the primary energy sources, is preferred for reasons such as being efficient, polluting the air less and being cheaper than its alternatives. With these motives, natural gas imports in our country have increased in recent years. In addition, parallel to the increase in the number of users, the fact that natural gas is the main cost factor in the industrial sector and electricity generation has kept natural gas policies on the agenda. As of 2021, 23.1% of Turkey's total electrical energy demand was obtained from natural gas, 34.5% from coal, 25.5% from hydraulic and 16.8% from renewable energy sources. By the end of 2021, a total of 58.7 billion sm<sup>3</sup> of natural gas was imported. Turkey's natural gas production in 2021 is only 394 million sm<sup>3</sup>.

Considering only the consumption data for 2021, Turkey imported 99.3% of the natural gas it needs. To reduce the share of foreign natural gas imports in our country's energy needs, the natural gas in the Black Sea should be brought into the economy as soon as possible. In addition, if the detection of new underground energy sources is aimed, energy diversity and supply security will be ensured.

Apart from these, investments to increase alternative energy sources such as solar energy and wind energy should be accelerated to reduce the dependence on natural gas and other fossil fuels. The use of alternative energy sources should be increased. At the same time, the number of energies importing countries should be increased in order to ensure energy supply security, and necessary measures should be taken in terms of energy supply security against possible military and political risks.

As a result of our work, the number of natural gas consumers increased due to the natural gas distribution tenders held in 2004 and after, this increase increased the natural gas demand, natural gas imports increased due to the inability to meet the increasing demand with domestic resources, and the payments made for imports had an important place in the current account deficit, In 2021, Turkey's current account deficit is ADD 46.2 billion, if the natural gas consumed in 2021 was possible to be supplied with domestic resources, the current account deficit would be \$ 29.3 billion. In 2021, the share of payments made for natural gas in the total current account deficit figure is 37% has been found to be.

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