ANALYSIS JULY 2017 NO: 35

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SETA | FOUNDATION FOR POLITICAL, ECONOMIC AND SOCIAL RESEARCH
Nenehatun Caddesi No: 66 GOP Çankaya 06700 Ankara TÜRKİYE
Phone:+90 312.551 21 00 | Fax :+90 312.551 21 90
www.setav.org | info@setav.org | @setavakfi

SETA | İstanbul
Defterdar Mh. Savaklar Cd. Ayvansaray Kavşağı No: 41-43
Eyüp İstanbul TÜRKİYE
Phone: +90 212 315 11 00 | Fax: +90 212 315 11 11

SETA | Washington D.C.
1025 Connecticut Avenue, N.W., Suite 1106
Washington, D.C., 20036 USA
Phone: 202-223-9885 | Fax: 202-223-6099
www.setadc.org | info@setadc.org | @setadc

SETA | Cairo
21 Fahmi Street Bab al Luq Abdeen Flat No 19 Cairo EGYPT
Phone: 00202 279 56866 | 00202 279 56985 | @setakahire

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ABOUT THE AUTHORS

Erdal Tanas Karagöl
Karagöl graduated from Istanbul University Faculty of Economy, Economy Department in 1992. He received his MA degree from the University of Connecticut and his PhD from York University in Britain in 2002. His PhD thesis was entitled "The Foreign Debts and Economic Growth Relation and Postponment of Foreign Debt Risk." He has published numerous articles and research papers in the areas of foreign debt, current deficit, economic growth, defense expenditures, energy, unemployment, public expenditures, poverty, and social aid. He is currently a faculty member at Yıldırım Beyazıt University Faculty of Political Science, Economy Department.

İsmail Kavaz
Kavaz graduated from Gazi University, Department of Econometrics in 2009. He received his MSc degree from the University of Leicester in 2012. Currently, he is continuing his PhD education at Ankara Yıldırım Beyazıt University and working as a research assistant at the same establishment. His main interests are energy economy, foreign trade, and economic growth. He is also a research assistant at SETA Foundation, Department of Energy Researches.

Salihe Kaya
Kaya graduated from the Faculty of Economics and Business Administration at Marmara University. She is an MA student at the Department of Social Policy at the Institute of Social Sciences, Ankara Yıldırım Beyazıt University. She specializes in the areas of energy economy, economic growth, development, social policy, and R&D. Kaya is also a research assistant at SETA Foundation, Department of Energy Researches.

Büşra Zeynep Özdemir
Özdemir graduated from the Department of International Relations and European Union at the Faculty of Economics, Izmir University of Economics, in 2013. She received her MA degree on sustainable enegy; her thesis was entitled "European Energy Union: A Further Step Ahead or Reorganization?" at the Insitute of Social Sciences, Izmir University of Economics, in 2016. Özdemir continues her PhD at the Department of Political Science and International Relations and works as a research assistant at SETA Foundation, Department of Energy Researches.

ABSTRACT

The National Energy and Mining Policy of Turkey has been developed on the basis of "strong economy and national security" and is crucial in so far as it will shed light on the distance the country will cover in the regional and global energy market in the upcoming years. The way to shape Turkish foreign policy, characterized by strong diplomacy, is to decrease energy dependency on imported resources, first, and then, achieve energy self-sufficiency. Prepared by the Ministry of Energy and Natural Resources, the National Energy and Mining Policy of Turkey has been developed in line with this objective. The featured axes of this policy, namely security of supply, indigenization, and foreseeable market, will form a guide for Turkey to reach a better position in the energy field.

As one of the stable and developed countries in its region, Turkey is, at the same time, located on the transit route of the countries that supply and demand energy. If Turkey meets the objectives set in the National Energy and Mining Policy, the country will turn the advantages of its geographical location into opportunities.

The strategies for security of energy supply are particularly emphasized in this policy with projects such as pipelines, both under construction and

The analysis examines the National Energy and Mining Policy of Turkey along the lines of security of supply, indigenization, and foreseeable market. It concentrates on the goals and objectives of this policy.

existing ones; Liquified Natural Gas (LNG) investments; and storage facilities. The Ministry has featured the issue of indigenization as the second axis of the policy and has taken critical steps to increase the use of indigenous energy resources. Important objectives of the indigenization segment of the policy are investments in renewable energy; the introduction of nuclear energy to the economy as soon as possible; and the indigenization of mining technologies and while doing so, the use of local equipment and labor force. Lastly, the foreseeable market objective, based on the development of energy markets and the restructuring of institutions in the energy sector, has been announced as the third axis of the National Energy and Mining Policy.

In this analysis, the National Energy and Mining Policy of Turkey will be examined in the framework of these three axes and, in particular, the goals and objectives of this policy will be discussed. The policy, designed to transform Turkey into a more powerful regional and global actor, is a guiding light for using the country's natural resources in a more effective and productive way.

INTRODUCTION

Turkey has become one of the countries with a voice in the global economic system owing to improving its economic outlook in recent years. With the country's increasing Gross Domestic Product (GDP) since the early 2000s, Turkey has aimed to move from the group of middle income countries to the group of high income countries, and has demonstrated that it can become one of the top ten economies in the world.

Economic growth led to an increase in energy consumption, urging Turkey to diversify its energy policies. The energy produced from indigenous resources failed to meet growing demand, and Turkey eventually became dependent on imported energy in order to meet about 70 percent of its energy demand. Increase in the imported energy bill became one of the most important reasons for the current account deficit increase; therefore, Turkey inevitably had to work on new policies to decrease its energy imports.

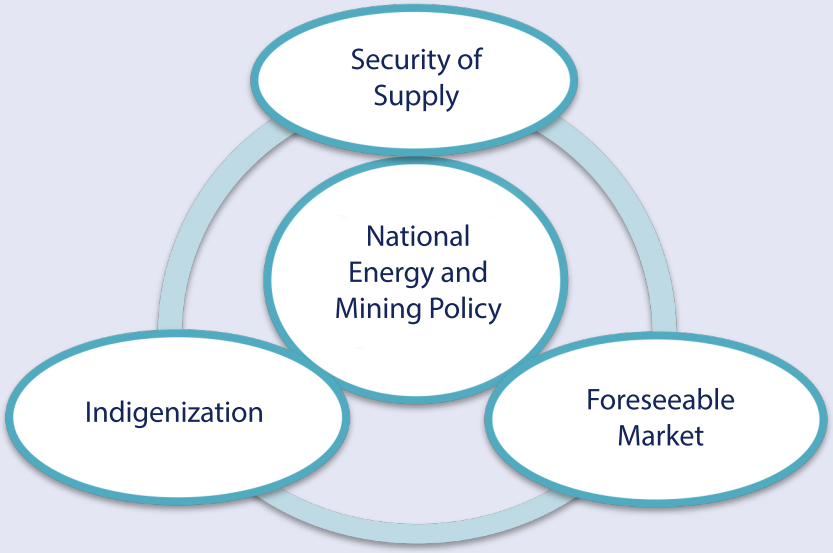
In order to improve energy policies and strategies, efforts launched for an energy vision as part of Turkey's 2023 targets continued with the 2015-2019 Strategic Plan prepared by the Ministry of Energy and Natural Resources (MENR). Related policies principally aim to reduce external energy dependency and steer Turkey's current change and transformation.

As part of the policies, studies have been conducted to increase energy production by the use of indigenous resources and significant progress has been made in the field of renewable energy in order to reduce dependency on imported resources. In addition, major pipeline projects and investments in LNG storage and ongoing efforts for two nuclear plants exemplify the progress that Turkey has made on security of energy supply.

Turkey, on the one hand, adopts effective and innovative energy policies based on transparency, reliability and sustainability in the scope of its objective to become an energy trading country; and, on the other hand, aims for a liberal and competitive domestic energy market structure. To this end, Turkey has shown a tremendous achievement in the formation of a foreseeable energy market and in the establishment of effective energy markets for the arrangement of interinstitutional relations in the energy sector.

In the scope of all these policies and objectives, Turkey plans to put its feet on the ground firmly in the field of energy and meet future expectations. Lastly, the National Energy and Mining Policy, which has been announced via the slogan "Independent Energy, Strong Turkey," once again clearly reflects the country's determination on the issue of energy. In the frame of this policy, Turkey plans to reach its goals in the field of energy; namely, security of supply, indigenization of energy, and formation of a foreseeable energy market (Figure 1).

FIGURE 1. AXES OF NATIONAL ENERGY AND MINING POLICY



In this study, the ongoing developments in the Turkish energy market and the prospective endeavors in terms of the National Energy and Mining Policy are analyzed. Firstly, the scope and goals of this policy will be assessed in detail. Secondly, the main axes of this policy, i.e. security of supply, indigenization of energy resources, and foreseeable energy market, will be examined under the heading of scope and goals. Lastly, a conclusion and recommendations will be presented.

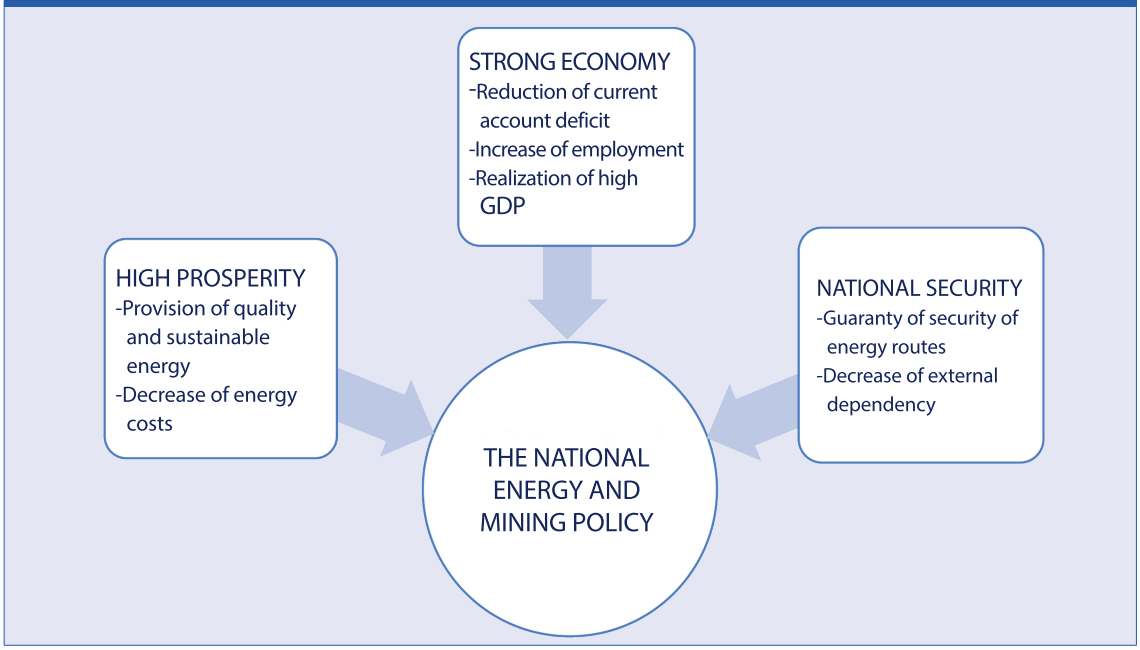
THE SCOPE AND GOALS OF THE NATIONAL ENERGY AND MINING POLICY

In the last fifteen years, Turkey has undergone a rapid transformation in many areas. The country aims to rise to the upper league of growth and development through the projects accomplished, the objectives set, and the policies developed in the field of energy. To this end, the National Energy and Mining Policy of Turkey, announced on April 6, 2017 by the Minister of Energy and Natural Resources Berat Albayrak, is crucially important as it establishes the prospective energy vision for the upcoming period. The policy aims to achieve progress in many areas of energy, from production to consumption and from distribution to transmission. With this policy, Turkey targets the resumption of the process of stable change and transformation.

The energy issue is extremely important for Turkey, and has been shaped in the framework of the policies that under development and the strategies in progress. Turkey has lately assumed a critical mission both on national and international energy platforms, and continues to strengthen its energy policies. The National Energy and Mining Policy was developed to this end; and the strategies introduced in this policy are designed to consolidate Turkey's position in global energy markets. These strategies are summarized under the headings of security of supply, indigenization of energy sources, and a foreseeable energy market (Table 1).

TABLE 1. STRATEGIES AND GOALS OF THE NATIONAL ENERGY AND MINING POLICY		
	STRATEGIES	**GOALS**
SECURITY OF SUPPLY	• To increase diversification of energy resources and supplier countries • To increase the capacity of natural gas and oil storage facilities • To increase the capacity to provide natural gas to the system • To strengthen the infrastructure of energy delivery • To increase energy efficiency	• To achieve quality and sustainable energy by increasing security of supply • To reach 10 bcm natural gas and 5 mto storage capacity • To conduct oil and natural gas explorations in the Mediterranean and Black Seas • To provide natural gas services to all Turkish provinces • To save 8.4 billion U.S. dollars from energy costs
INDIGENIZATION	• To make progress in renewable energy through local production, R&D and YEKA • To contribute to the generation of electricity by using nuclear technology • To indigenize mining technology	• To increase domestic energy production • To increase the share of renewable energy in total energy production by at least 30 percent • To increase the share of NPPs in electricity generation by at least 10 percent according to the forecasts for 2023 • To decrease the imports in the mining sector through enrichment and the reuse of mines for their raw or intermediary materials.
FORESEEABLE ENERGY MARKET	• To improve the energy supply infrastructure • To restructure the institutions in the sector • To revive the energy markets • To consolidate the mining market	• To improve the infrastructure of natural gas storage facilities, oil pipelines, FSRU and LNG • To restructure TEİAŞ, BOTAŞ, TPAO and ETİMADEN for their integration into the energy market • To increase functionality of the Energy Exchange Istanbul (EXIST) • To improve the mining sector through the cooperation of the public and private sectors

FIGURE 2. OBJECTIVES OF THE NATIONAL ENERGY AND MINING POLICY



The following topics will be examined as direct outcomes of the successful implementation of the suggested policies (Figure 2):

- The formation of a strong economic structure by reducing the energy-related current account deficit and increasing employment in parallel with the development of the country's energy sector is believed to lead to a higher GDP.
- The aim of high-level prosperity will also be achieved through providing good-quality and sustainable energy by reducing energy costs and achieving security of supply.
- Turkey's chronic problem has been the long term heavy reliance on external energy resources. Therefore, reducing external dependency and lessening risks stemming from security of supply are envisaged.

This analysis will scrutinize the three critical axes of the National Energy and Mining Policy, namely security of supply, indigenization, and foreseeable market; and the strategies planned and materialized along these axes will be clarified.

SECURITY OF SUPPLY

The Ministry of Energy and Natural Resources stated that in order to provide sustainable energy, it is crucial for Turkey to ensure security of supply, one of the three axes introduced in the National Energy and Mining Policy. Security of supply will be one of the priority areas which will determine Turkey's future energy perspective. The main aims of security of supply are to achieve diversification of energy resources and markets; sustainability and reliability of resource transfer; and the reduction of the costs of imported energy products. Security of supply is also closely related to the subjects of "strong economy" and "national security" that are mentioned in the National Energy and Mining Policy.

The issue of security of supply has become a priority for energy-importing countries in recent years due to the ever-increasing need for energy resources. Among the countries with high demand increase on a global scale, Turkey maintains its economic growth, and develops policies to meet increasing energy demand. As oil and natural gas are used in many sectors (industry,

housing and transportation), rising oil and natural gas import deepens dependency on external energy sources - and forces Turkey to explore new ways to maintain its security of supply.

With this in mind, the National Energy and Mining Policy discusses the issue of security of supply under five headings: diversification of energy resources and supplier countries; natural gas and oil storage facilities; capacity to provide natural gas to the system; energy delivery infrastructure; and energy efficiency.

Turkey continues to be dependent on a few particular countries in regards to oil and natural gas import, and this introduces certain risks surrounding security of supply and necessitates the development of new projects for the diversification of energy resources and supplier countries. Turkey's dependency on imported oil and natural gas is already above 90 percent. Therefore, the diversification of import markets becomes crucial for Turkey. As known, Turkey imports natural gas from Russia (via West Pipeline and Blue Stream), Azerbaijan (via Baku-Tbilisi-Erzurum Pipeline, BTE), Iran, Algeria, Nigeria, Qatar and the United States of America; while it imports oil mostly from Iraq (via Kirkuk-Yumurtalık Pipeline), Russia, Iran and Azerbaijan (via Baku – Tbilisi - Ceyhan Pipeline, BTC).

In addition to these existing pipelines, in order for Turkey to increase the diversification of its import markets, plenty of pipeline projects are under development and/or in the planning phase. The Trans-Anatolian Natural Gas Pipeline (TANAP), which will transfer Azerbaijani natural gas to Turkey, is expected to commence operations in mid-2018. Furthermore, Turkey and Russia continue to work on the 'Turk Stream Natural Gas Pipeline Project' planned as an alternative to the West Pipeline by which Turkey already imports Russian natural gas. On the other side, Turkey has imported oil from the Kurdistan Regional Government (KRG) for many years; and talks for the Northern Iraq Natural Gas Pipeline are in progress for more. Lastly, with the "Eastern Mediterranean Natural Gas Pipeline" project, Turkey plans to strengthen its security of natural gas supply by increasing the diversification of its natural gas suppliers (Figure 3).

FIGURE 3. TURKEY'S EXISTING AND PLANNED OIL AND NATURAL GAS PIPELINES

Source: MENR

LNG also seems to be an alternative energy resource to reduce dependency on a few supplier countries. For this reason, Turkey is making critical investments in the LNG field. With its increasing energy consumption, Turkey has become a country to which many others wish to export natural gas via LNG. Actually, Turkey began to import LNG in 1994 through the first regasification terminal, Marmara Ereğli. Turkey's first imported LNG was from Algeria, and Nigeria followed. In addition, Ege Gaz Aliağa regasification terminal, which was founded in 2001 and started operations in 2006 in the Aegean town of Aliağa, has greatly contributed to Turkey's LNG import. Via the two regasification terminals, Turkey imports a total of 12 billion cubic meters of LNG.[1]

Ensuring security of supply will be one of the priority areas that will determine Turkey's future energy strategy.

After 2009, Turkey imported LNG from Qatar through spot markets and from the USA, which is becoming an energy exporting country. Considering Turkey's annual natural gas consumption, more regasification terminals are needed in order to maintain security of supply. However, it takes time for such terminals to go into operation, which compels Turkey to search for other alternatives.

In this context, LNG import has begun to increase via a Floating Storage Regasification Unit (FSRU), while such units become more of an issue in international natural gas markets. Turkey's first FSRU was a critical investment in terms of security of natural gas supply. Having the storage capacity of 85 million cubic meters and the ability to pump a maximum of 20 million cubic meters of gas per day, the country's first FSRU facility entered into service in six months. In addition, a second investment in an FSRU will be made for increasing capacity to pump 20 million cubic meters daily; the second FSRU will be owned by BOTAŞ, the Petroleum Pipeline Corporation, which is Turkey's state-owned crude oil and natural gas pipelines and trading company. The second FSRU will further strengthen the country's hand in security of supply.

Turkey succeeded in increasing its LNG capacity from 34 million cubic meters to 64 million cubic meters (about 90 percent) in 2016, and intends to increase this figure to 107 million cubic meters in 2017.[2] As the natural gas demand has increased in the first quarter of the year, Turkey should invest in this particular area by increasing the share of LNG to the level of 25 percent via FSRU to meet demand.[3]

In addition to diversification of gas supplier countries, Turkey should also diversify its energy resources. In order to be less dependent on imported fossil fuels, Turkey has been developing new policies to use more of its national resources. In this regard, the National Energy and Mining Policy emphasizes that the shares of renewables, coal, and nuclear energy should also be increased.

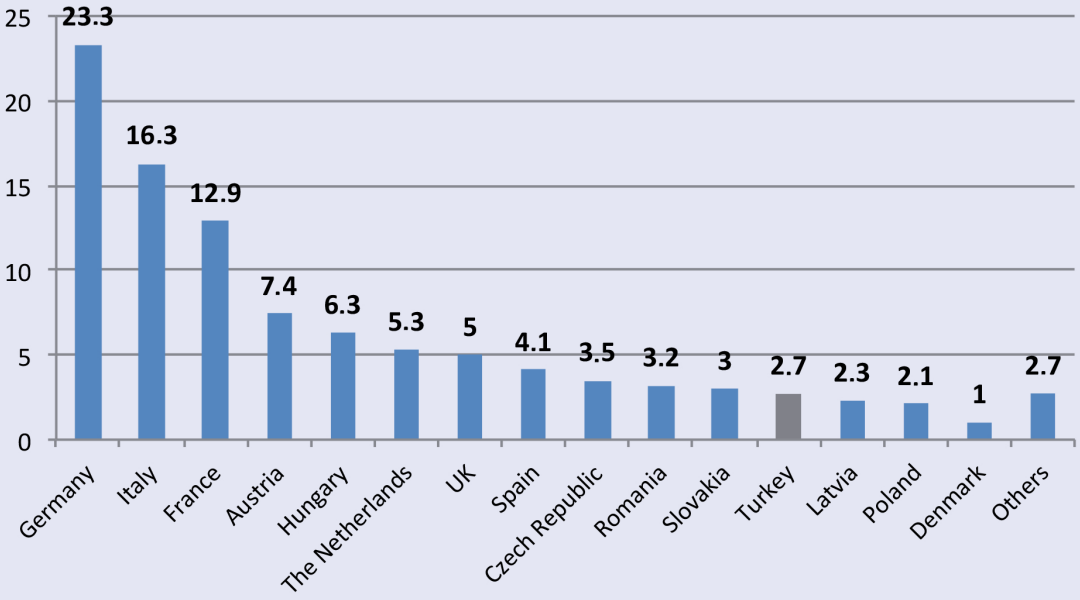
It is important to balance the increase in demand arising from seasonal differences in Turkey where energy dependence is concentrated on natural gas. Therefore, with respect to security of supply, investments made in natural gas storage facilities become the second important heading in the policy.

1. Erdal Tanas Karagöl and Salihe Kaya, *LNG'nin Dünya Enerji Ticaretindeki Yeri*, (SETA Rapor, İstanbul: 2016).

2. "Türkiye'nin İlk FSRU Tesisi Açıldı", ETKB, http://www.enerji. gov.tr/tr-TR/Bakanlik-Haberleri/Turkiyenin-Ilk-FSRU-Tesisi-Acildi, (Access date: May 1, 2017).

3. "2017 Q1'de Doğalgazda Rekor Tüketim", Enerji IQ, *Enerji Piyasası Raporu*, Issue: 232.

FIGURE 4. MAXIMUM STORAGE CAPACITIES OF SELECTED EUROPEAN COUNTRIES (2014, %)



Source: CEDIGAZ[4]

Natural gas storage facilities contribute in eliminating seasonal differences in consumption and potential technical failures in the area of natural gas. Natural gas is mainly stored in underground reservoirs. Suitable environments for natural gas storage are depleted oil and natural gas areas, aquifers,[5] salt caves, and abandoned mine pits - all of which are abundantly found in Turkey.[6]

Such facilities provide natural gas in the periods of low demand and support the consumption of natural gas when demand is high. Furthermore, natural gas storage facilities are important in terms of:

- Meeting short-term excessive consumption of natural gas in winter when demand is the highest.
- Meeting increasing demand for electricity generation in summer.
- Balancing outflows in natural gas pipeline systems.
- Reducing fluctuations in gas prices.[7]

European countries that are highly dependent on Russian natural gas, such as Turkey, have realized new projects to decrease their dependency. In this context, natural gas storage facilities have recently become more important. According to the data of 2014, Germany, as one of the largest economies in Europe, stores 23.3 percent of the natural gas it imports. Italy follows with 16.3 percent storage capacity and France with 12.9 percent. Turkey is ranked in the 12th place among the European countries with 2.7 percent storage capacity (Figure 4).

4. Geoffroy Hureau, "Gas Storage in Europe, Recent Developments and Outlook to 2035", European Gas Conference, Vienna, January 27-29, 2015, http://www.europeangashub.com/custom/domain_1/ extra_files/attach_643.pdf, (Access date: April 24, 2017).

5. Aquifers are permeable geological formations, which store and carry significant amount of water quickly.

6. Gas Storing Directorate, www.tpao.gov.tr/tp5/docs/ppt/Depolama2014.ppsx, (Access date: April 25, 2017).

7. "Doğal Gaz Depolama", Turkish Petroleum, http://www.tpao.gov. tr/tp5/?tp=m&id=84, (Access date: April 25, 2017).

Considering the advantages of its position, Turkey has a chance to import more oil and natural gas than is demanded for its consumption. Storing excess consumption oil and natural gas will both guide Turkey towards ensuring security of supply and pave the way for re-exporting its stored resources. Spain takes the lead in re-export rates owing to its storage facilities despite the fact that the country lacks resources.[8]

Turkey continues to be dependent on a few particular countries in regards to oil and natural gas import, and this introduces certain risks surrounding security of supply and necessitates the development of new projects for the diversification of energy resources and supplier countries.

In regards to increasing Turkey's security of supply, the third heading analyzed in the National Energy and Mining Policy is natural gas supply capacity. Turkey's daily maximum natural gas consumption is around 247 million cubic meters. Considering that the capacity of natural gas inflow was 190 million cubic meters as of the end of 2016, this amount is clearly insufficient. Concordantly, in the abovementioned policy, one of Turkey's primary goals in order to maintain security of supply is to initially increase natural gas inflows to 300 million cubic meters and to 400 million cubic meters in the long run.

8. "Gas Carousel Making Spain Europe's Biggest LNG Exporter", Bloomberg, April 11, 2014, https://www.bloomberg.com/news/articles/2014-04-10/gas-carousel-making-spain-europe-s-biggest-lng-exporter, (Access date: April 24, 2017).

The fourth heading in the National Energy and Mining Policy, as part of security of supply, is the rehabilitation of natural gas transfer and distribution infrastructure. The goal, here, is to transmit natural gas to cities and towns that do not have any natural gas services. To this end and as part of the contributions to security of supply, Turkey plans to transmit natural gas to 220 additional towns in 2017.

The last heading in the policy is to boost energy efficiency. For efficient use of energy, efforts are underway to raise awareness in public and private sectors, industrial facilities and housings. Indeed, energy efficiency is so significant that if it is applied effectively, it can reduce the amount of imported energy by nearly half; and this can help to reduce the imported energy bill, as well.

Turkey plans to increase the use of national and renewable energy resources in order to reduce its dependency on imported energy products, and aims to lower energy imports by using existing energy resources more efficiently. In this manner, Turkey aims to contribute to its security of supply. In the scope of the National Energy and Mining Policy, Turkey also intends to save 8.4 billion U.S. dollars owing to a new action plan for energy efficiency.

Recent projects, based on the win-win principle, reflect Turkey's goal to become a stronger country both in its region and worldwide, and a leading actor in energy markets. In recent years, Turkey has signed multiple projects to ensure security of supply of energy, a topic that has occupied the agenda, and intends to continue with such projects in the upcoming periods. In order for Turkey, as a natural bridge between the world's largest energy-supplier and energy-demanding countries, to turn this advantage into an opportunity, it needs to develop new policies in the aforementioned five fields that will contribute to security of supply and to focus on this issue in the upcoming period.

INDIGENIZATION

Indigenous production by using national resources is important in reaching energy without being dependent on external energy resources. In this regard, indigenization, the second item on the National Energy and Mining Policy, is critically important for Turkey to add a new dimension to its policies and strategies for the reduction of the country's years-long import dependency. Many public and private sector institutions and organizations, in particular the MENR, are spending tremendous efforts to increase the use of national energy resources. As part of the country's 2023 vision, efforts on the indigenization of energy have continued with the 2015-2019 Strategic Plan prepared by the Ministry. In the same vein, the National Energy and Mining Policy emphasizes, once again, the necessity of a dynamic vision for energy indigenization.

To increase production from indigenous energy resources is critical in terms of ensuring security of supply for a country, such as Turkey, that meets about 70 percent of its energy need from imported energy sources. As Turkey's population has increased over the years, it is necessary for the country to place importance on indigenous energy projects in order to lower economic and/or political risks concerning security of supply. In this regard, significant efforts have been made to meet energy demand by using indigenous resources. That being said, Turkey has accelerated investments in sustainable energy in the last 15 years. Accordingly, renewable energy investments that aim to bring natural resources into the economy are extremely critical for diversifying energy resources.

Increasing investments in renewable energy – particularly in recent years - are addressed in the National Energy and Mining Policy as Turkey has made noteworthy progress in the production of energy via renewable energy sources. Renewable energy sources in Turkey are used inadequately. Therefore, the policy aims to bring renewable energy resources into the economy as soon as possible and promotes producing energy from indigenous resources. According to the data of 2016, Turkey, having a total of 35 GW installed capacity in renewable energy, strives to increase the level of renewable energy in total energy consumption by at least 30 percent as part of its 2023 targets. As hydropower plants, a conventional renewable energy resource, constitute a large part of the installed capacity, significant investments have mostly been made in modern renewable energy sources (wind, solar, biomass, etc.).

Owing to the country's geographical location, Turkey's potential to benefit from solar energy is high. In fact, compared to other renewable energy resources, Turkey's solar energy potential is the highest among other renewables. The country's solar energy capacity has reached 1,000 MW as of March 2017,[9] while there are works underway to increase the current capacity. Meanwhile, the bidding process for Turkey's and the world's largest solar energy power plant in the region of Konya-Karapınar, with the capacity of 1,000 MW has been concluded and, as a result, Turkey has stepped up to a new level in the use of modern renewable energy resources.[10] A total of 1.3 billion U.S. dollars will be invested in this project and the objective is to deliver electricity to 600,000 houses. In parallel with the indigenization strategy, this project is also intended to encourage job growth through stipulating the employment of Turkish engineers in up to 80 percent of the available jobs. With this and similar projects, Turkey aims to reach a total of 5,000 MW installed solar energy capacity by 2023.

9. "Türkiye Elektrik Sistemi Kuruluş ve Yakıt Cinslerine Göre Kurulu Güç", TEİAŞ, www.teias.gov.tr/yukdagitim/kuruluguc.xls, (Access date: February 10, 2017)

10. "Konya'da Dünyanın En Büyük GES'i Kuruluyor", *Sabah*, October 21, 2016.

A similar project is also intended for wind energy. As of the end of 2016, installed power capacity in wind energy reached 6,081 MW. However, tremendous efforts have also been made to increase this figure to 20,000 MW in accordance with the 2023 targets. Accordingly, the bidding deadline for the wind energy in the scope of the Renewable Energy Resource Area (YEKA in Turkish) with 1,000 MW of installed capacity is set at the end of July 2017; it has been decided to finalize the bidding and put the project into effect in 2017. Also, the use of domestic equipment (at least 65 percent) and the employment of native Turkish engineers (80 percent) are stipulated in the conditions of the project.

Carrying these projects into effect can lower the country's energy costs: increase in the use of indigenous resources will result in decrease in the amount of imported energy resources, and will also contribute to reducing electricity prices. These projects are also expected to increase employment rate and significantly affect the economic growth and development of Turkey.

Another source of renewable energy is hydropower plants (HPP). Among the other renewables, hydropower makes the largest contribution to electricity generation in Turkey, as it does in the world. The installed capacity of hydropower increased to 27,000 MW as of the end of 2016, however the goal is to improve this figure to 36,000 MW as part of the 2023 targets. As the hydropower potential of the country is high due to its geological structure, Turkey makes great efforts to turn its potential into an advantage. In addition to the current working hydropower plants (HPP, or HES in Turkish), works are underway to increase the installed capacity by 6,500 MW of licensed HPPs and 3,500 MW of pre-licenced HPP projects.[11] Moreover, compared to modern renewable energy types, as a fully indigenous energy source, HPP systems generate electricity at a lower cost. In other words, these systems have a reducing effect on the price of electricity generation.

In recent years, significant progress has been made in the field of geothermal energy. Geothermal energy, as a completely indigenous energy source, also contributes to the security of supply. Since it is a low-cost and environment-friendly source, policy makers in Turkey have given special attention to geothermal energy. Geothermal energy had 17.5 MW of installed capacity in 2002; since then, however, remarkable progress has been made, and as of March 2017, the figure had increased to 850 MW. In the scope of the 2023 targets, the total installed capacity of geothermal energy is projected to be 1,000 MW (Table 2).

TABLE 2. INSTALLED POWER CAPACITY TARGETS FOR 2023 IN RENEWABLE ENERGY SOURCES (MW)

Hydropower	34,000
Wind	20,000
Solar	5,000
Geothermal	1,000
Biomass	1,000

Source: MENR

Besides renewable energy, there are also significant strategies and targets covering other energy resources in the National Energy and Mining Policy. Coal, for instance, has remained in the background and the share of indigenous coal plants in the country's total installed capacity has gradually decreased. In 2002, the share of indigenous coal in total installed capacity was 22 percent while this decreased to 12,5 as of March 2017.[12] In the long term, there are plans to set up new coal power plants to produce electricity by

11. "2017 yılı Bütçe Sunumu", The Ministry of Energy and Natural Resources Strategy Development Presidency, December 8, 2016, http://www.enerji.gov.tr/tr-TR/Butce-Konusmalari/Sn-Bakanin-Butce-Sunus-Konusmalari, (Access date: April 25, 2017).

12. "Türkiye Elektrik Sistemi Kuruluş ve Yakıt Cinslerine Göre Kurulu Güç."

using indigenous coal resources. In the scope of the 2015-2019 Strategic Plan, Turkey aims to generate 60 billion kWh of electricity using domestic coal by 2019. In order to increase the share of domestic coal in generating electricity, the MENR set the following objectives:[13]

- To formulate a special funding method for utilizing the existing coal mine reserves.
- To discover new reserve areas in addition to the existing ones.
- To concentrate on Research and Development (R&D) works for environment-friendly production of domestic coal.
- To revise the incentive system in the production of domestic coal.
- To work for more effective and productive use of state-owned coal power plants.

For many years, Turkey has been importing a large amount of the energy it consumes. Oil and natural gas are the most significant imports and are a heavy burden on the national budget. Hence, oil and natural gas exploration and drilling activities in the country, as one of the significant factors of the indigenization strategy, are critical. In this vein, exploration works that have been launched particularly in the Mediterranean maritime areas are also planned for the Black Sea basin. Turkey purchased the Barbaros Hayreddin Paşa Seismic Research/Survey Vessel, and seismic surveys were launched in the Mediterranean Sea as of April 21, 2017.[14] With these works, Turkey expects to increase domestic energy production and contribute to security of supply.

The state-owned Turkish Petroleum Corporation (TPAO) is engaged in activities not only in Turkey but also in Iraq, Russia, Libya, and Azerbaijan. The corporation projects to invest about 243 million dollars in Turkey and 1.5 billion dollars abroad, contributing to the efforts to increase oil and natural gas supply.[15] Conversely, joint works have been launched with international oil companies to incorporate potential shale gas reserves located in the Southeastern and Marmara regions into the economy. To this end, first, existing shale gas reserve areas are identified, and then, projects are carried out to launch production activities.

Another aspect of reducing dependency on imported energy and increasing indigenous power generation in the scope of indigenization efforts is nuclear energy activities. Works in this area began in 2010 when the Republic of Turkey and the Russian Federation signed a bilateral agreement on nuclear energy activities.

The agreement envisages the foundation of a 4,800 MW nuclear power plant (NPP) to be built in the region of Mersin-Akkuyu. Along with this, Turkey and Japan signed an intergovernmental cooperation agreement in 2013 for the construction of another 4,800 MW NPP in the Turkish province of Sinop on the Black Sea coast. It is expected that the NPPs in Akkuyu and Sinop will become operational in 2023 and 2025, respectively. Furthermore, works are underway to launch a third plant in 2023. With these developments, it is anticipated that the share of NPPs in electricity generation will be at least 10 percent according to the forecasts for 2023 electricity demand.[16]

The National Energy and Mining Policy also plans for the launching of development efforts by using nuclear technology in the fields of nuclear medicine, industry, agriculture, space technologies, and satellite communication. To this end, R&D activities with the support of universities, industry and the public sector have been organized.

The indigenization of mining technology is the final step of the indigenization axis specified

13. "2017 yılı Bütçe Sunumu."

14. "İlk Sondaj", *Yeni Şafak*, April 24, 2017.

15. "2017 yılı Bütçe Sunumu."

16. "Nükleer Enerji", ETKB, http://www.enerji.gov.tr/tr-TR/Sayfalar/Nukleer-Enerji, (Access date: April 11, 2017).

in the National Energy and Mining Policy. The goal here is to enrich domestic mines and increase the use of raw or intermediary materials that they can provide, and to decrease imports in the mining sector. To this end, Turkey concentrates on R&D efforts to raise domestic production, and has set goals and developed strategies for the enrichment and more efficient use of mines by means of technological innovations. By doing so, Turkey intends to increase the contribution of mines to the national economy.

With upcoming projects based on the win-win principle, Turkey aims to become a stronger country in its region and the world, and a leading actor in energy markets.

Briefly, the main goals and objectives of the indigenization strategy may be listed as follows:

- To expand the production sector by eliminating constraints arising from the capital-intensive structure of materials and equipment used in the energy sector.
- To increase employment by boosting domestic production.
- To improve R&D and innovation as part of indigenization efforts.
- To release products with high brand value following the progress of the indigenization process in accordance with international standards.
- To facilitate the transition to phases of high-value-added production together with the enhancement of incentive policies for domestic production.

In accordance with the above goals and objectives, the indigenization and diversification of a country's energy sources are critical if that country, like Turkey, imports 70 percent of the energy it consumes. According to foreign trade statistics released by the Turkish Statistical Institute (TurkStat, or TÜİK in Turkish), Turkey spent 27,155 billion dollars for energy imports under the heading of "mineral fuels, mineral oils and by-products generated by their distillation, bitumen materials, and ozocerites."[17] It is encouraging that the amount has been decreasing since 2012. The main reasons for this decrease may be the dramatic drops in oil prices in the global markets in recent years, Turkey's efforts to become a central country in energy trade, and the country's tremendous efforts to use energy resources more actively and efficiently.

Recent changes in Turkey's imported energy costs are positive but inadequate. In the upcoming term, efforts will continue to increase oil and natural gas exploration activities both domestically and abroad, particularly in the Black and Mediterranean Seas, in order to reduce imported energy spendings. In addition, investments in renewable energy, expanding the use of domestic coal mine reserves, and shale gas exploratory drillings have been accelerated. Thus, Turkey, in the first phase, plans to reduce imported energy dependency and energy costs, and following this, intends to speed up policies and projects to proceed in its own power generation.

FORESEEABLE ENERGY MARKET

The third axis of the National Energy and Mining Policy is the formation of foreseeable energy markets. To this end, Turkey intends to improve its electricity market and found a proper natural gas market, restructure institutions in the energy sector, rehabilitate the infrastructure of energy supply, and establish an active mining market.

17. "Dış Ticaret İstatistikleri, Aralık 2016", TÜİK, January 31, 2017, http://www.tuik.gov.tr/PreHaberBultenleri.do?id=24821, (Access date: May 5, 2017).

The energy demands of countries increase with growing and developing industry sectors, and the rise in population and growing economies. Consequently, new policies are developed to meet these demands. The formation of energy markets, which is one such policy, is a critical factor in determining countries' energy strategies.

The processes to form effective energy markets in developing countries, such as Turkey, follow similar patterns. Increasing efforts to create energy markets – particularly in the last 15 years – have taken on a new dimension with the axis of foreseeable energy markets envisaged in the National Energy and Mining Policy.

Turkey accelerated the formation of an energy market in the 2000s and paved the way for the change and transformation of public institutions and organizations operating in the sector. The Turkish Electricity Administration (TEK), the state-owned monopoly in the energy market since the early 1970s, was restructured in 1993 and split into two different bodies: the Turkish Electricity Distribution Company (TEDAŞ), and the Turkish Electricity Generation and Transmission Company (TEAŞ).

In 2001, changes were introduced to the structure of TEAŞ. Generation, transmission and trading activities were allocated to three different institutions: the Electricity Generation Company (EÜAŞ), the Turkish Electricity Transmission Company (TEİAŞ), and the Turkish Electricity Trading and Contracting Company (TETAŞ).

The Energy Market Regulatory Authority (EMRA or EPDK in Turkish) was created in the same year and, in this manner, the electricity market in Turkey gained an official status.[18] The Market Financial Settlement Center (MFSC or PMUM in Turkish) was established in 2003 so as to contribute to the elimination of supply-and-demand imbalances and prevent losses.

A transition period towards a free market followed and the Electricity Market Balancing and Reconciliation Regulation was implemented between 2004 and 2006. In this period, efforts were undertaken to prepare a market suitable for Turkey's characteristic features.

The legal basis of the Energy Markets Operation Company (EPİAŞ) was formed when the Electricity Market Law was passed in 2013. EPİAŞ was formally established in March 2015. Its main objective is to run all electricity markets, except those run by TEİAŞ and Borsa İstanbul A.Ş. (BIST) - formerly known as Istanbul Stock Exchange -, and ensure reliable price formation.

Since then, there have been further efforts to ensure more effective, foreseeable and efficient energy market operations. In this regard, EPİAŞ formed the Transparency Platform in 2016, and the platform enabled all participants in the market to reach instantaneous market trends on an equal basis and more efficiently.

Privatization efforts significantly contributed to the formation process of a foreseeable energy market. Privatization policies paved the way for the private sector to ease the burden on the public sector, and enabled the participation of the private sector in the market. This has helped the formation process of a foreseeable energy market in Turkey.

In addition to the electricity market, EPİAŞ aims to establish a natural gas market with the objective of increasing the predictability of the energy market. A natural gas market is obviously needed considering the existing pipelines and LNG facilities, the ongoing projects, and Turkey's position in the global system in terms of natural gas.

For this purpose, the Natural Gas Market Law entered into force in 2001 with the objective of eliminating state monopoly in import, export, transmission, distribution and sale of natural gas and hence, to provide the opportunity for domestic and foreign investors to enter

18. "2016-2020 Stratejik Planı", EPİAŞ, https://www.epias.com.tr/wp-content/uploads/2016/12/2016-2020_Epias_Stratejik_Plani.pdf, (Access date: April 29, 2017).

the market.[19] EMRA called for tenders for the first intracity transmission in 2003. The transmission network run by the state-owned BOTAŞ was opened to third parties in 2004. An amendment in the Natural Gas Law enabled the import of LNG from spot markets, an alternative to natural gas imports through pipelines.

Lastly, fundamental changes and regulations in the Natural Gas Law in 2013 cleared the way for the private sector. As a result, private companies entered the liberalizing natural gas market as importers and gas wholesalers.[20]

On account of innovations and breakthroughs in the last 15 years, Turkey's energy market has improved remarkably and become a role model for countries without energy markets. Furthermore, the natural gas trade platform will accompany the electricity market soon, and this, in turn, will secure Turkey's position in the global energy system.

In recent years, a series of major energy projects have been signed and these projects will undoubtedly contribute to Turkey's goal to become an energy trading center. With the National Energy and Mining Policy, Turkey takes a firm stand on the subject and keeps working to repeat the achievements of recent years.

The National Energy and Mining Policy reveals several strategies and objectives in order to create a more foreseeable, transparent and investor-friendly energy market. Turkey's energy demand increases in accordance with its growing economy and, thus, the country's primary objective is to ensure sustainable energy supply. In order to improve supply infrastructure, the goal is to increase the number and the capacity of natural gas storage facilities, rehabilitate oil and natural gas pipelines, and improve infrastructures of FSRU and LNG, as another type of natural gas supply.

In order to finance the energy sector, it is critical to attract both foreign and domestic investors. In this context, having foreseeable energy markets will contribute to Turkey's security of supply.

Restructuring institutions and organizations in the sector is also critical for the market to deepen. There are plans for institutions, such as TEİAŞ, BOTAŞ, TPAO and ETİMADEN, to be integrated into the energy market and to take on more active roles in it.

The Natural Gas Trade Platform will be put into effect in 2018 so as to improve and increase the functionalities of the energy markets. Clearly, the platform will directly contribute to Turkey's objective of becoming an energy trading center. Owing to these projects, Turkey, which hosts many regional projects, will not only reach a position to store and re-export the energy sources transmitted to Turkish territory but will also have a say in pricing rather than simply being an intermediary country in the energy trade.

The mining sector, having one of the largest shares in export, is critical for energy markets as well. The National Energy and Mining Policy makes provisions for the enhancement of the mining sector through the cooperation of the public and private sectors and the generation of electricity by domestic mines.

Turkey has taken critical steps in the development and predictability of energy markets as its economy has continuously grown for the last 15 years. The membership of EPİAŞ in the Association of Power Exchanges (APEX) and the European Energy Markets (EUROPEX) in 2016 proves the existence of an effective energy market in Turkey. Turkey has demonstrated that its energy market can operate at international standards not only in the country but also in its region and the world.

19. "Doğalgaz Piyasası Kanunu Üzerine", TMMOB, https://opnkm.mmo.org.tr/haziran-2001/makale/dogalgaz-piyasasi-kanunu-uzerine, (Access date: April 30, 2017).

20. "Türkiye'de Doğal Gaz Piyasası'nın Tarihçesi", Kibar Enerji, http://www.kibarenerji.com/Bilgi-Bankasi/Dogalgazin-tarihcesi.aspx, (Access date: April 30, 2017).

Development processes in Turkey's energy markets indicate that works are underway for the formation of foreseeable and effective markets, particularly in the upcoming years. In this context, the last axis of the National Energy and Mining Policy, namely operational capabilities of foreseeable energy markets, is shaped around strategies involving the restructuring of institutions operating in the sector, the development of energy and mining markets, and the rehabilitation of procurement infrastructure.

In addition to its realizing its objective to create foreseeable markets and achieve security of supply and indigenization, Turkey will also reach its goals in the energy field and strengthen its position in the global energy market.

CONCLUSION AND RECOMMENDATIONS

In an attempt to turn its geographical position and potential into an advantage, Turkey has set achievable goals in recent years and made critical moves in order to reap the benefits of this advantage. The MENR acts with the intention of contributing to the welfare of the country by using energy resources efficiently and sensitively with regards to the environment. With the release of the National Energy and Mining Policy, the Ministry has taken a critical step in the direction of raising the country's prosperity to the highest level.

The policy which is developed under the headings of security of supply, indigenization of energy, and foreseeable energy markets will be a guide for Turkey to reach its future goals in energy.

In the last 15 years especially, economic and social indicators have improved in Turkey. In order to meet the increasing energy demand without any disruption, Turkey continues to develop policies to meet considerable part of its energy demand by increasing power generation from domestic resources, and to enable energy markets to gain depth. The recent National Energy and Mining Policy is one among several such strategy documents.

By virtue of its geographical location, Turkey connects energy-supplying and energy-demanding countries. As a consequence, the policy developed by Turkey becomes extremely important on both the national and international level.

Owing to these policies, Turkey expects to play a key role in the global energy game in the coming years. In this regard, the TANAP and the Turk Stream projects are extremely significant. Concordantly, with its fully effective energy markets, Turkey will become not only a country transmitting energy but also a price-setting country and will acquire an energy trading center identity.

Founded by EPİAŞ in 2016, the Transparency Platform enables all market participants to reach instantaneous market trends simultaneously, effectively, and on an equal basis.

Many projects have been developed to bring domestic energy resources with tremendous potential into the economy. Some of the main strategies cited in the National Energy and Mining Policy in order to decrease Turkey's dependency on imported energy are to increase the use of renewable energy resources, domestic coal and nuclear energy, and to bring domestic oil and natural gas reserves to life.

In order for Turkey to claim a position among high income countries and become one of the world's largest economies, these policies and strategies should be put into effect as soon as possible. At this point, the cooperation of the public and private sector is important. To pave the way for the private sector and to enliven the economy by easing the burden on the public sector, incentives for the private sector should be increased. In this direction, reducing bureaucracy in the energy sector will be beneficial.

In addition, a critical factor for carrying the aforeementioned energy policy into effect is to introduce regulations that will solve the problem of skilled manpower. Furthermore, technological progress is needed especially in renewable energy. Turkey should seriously focus and invest in the production of equipment by using local technology.

Ensuring the security of supply is a must for a country, such as Turkey, that depends on external sources. Hence, domestic energy production should be increased to minimize the risks involving security of supply.

For this reason and in order for Turkey to reach its goals, the country needs policies supported by stable energy strategies. It should not be overlooked that the policies developed for energy affect many areas, from Turkey's economy to its prosperity, and from its security to its politics.

Considering the features of the general frame of Turkey's energy policy, it becomes evident that the National Energy and Mining Policy will make a significant contribution to Turkish economy. In this regard, the country's economic stability will be ensured through the efforts and support of both the public and private sectors. These steps are necessary in order to decrease the current account deficit, increase employment, provide quality and uninterrupted energy flow, lower costs in the generation-transmission-consumption phases, secure energy transmission routes, and, most importantly, reduce external dependency.

The National Energy and Mining Policy of Turkey has been developed on the basis of "strong economy and national security" and is crucial in so far as it will shed light on the distance the country will cover in the regional and global energy market in the upcoming years. The way to shape Turkish foreign policy, characterized by strong diplomacy, is to decrease energy dependency on imported resources, first, and then, achieve energy self-sufficiency. Prepared by the Ministry of Energy and Natural Resources, the National Energy and Mining Policy of Turkey has been developed in line with this objective. The featured axes of this policy, namely security of supply, indigenization, and foreseeable market, will form a guide for Turkey to reach a better position in the energy field.

In this analysis, the National Energy and Mining Policy of Turkey will be examined in the framework of these three axes and, in particular, the goals and objectives of this policy will be discussed. The policy, designed to transform Turkey into a more powerful regional and global actor, is a guiding light for using the country's natural resources in a more effective and productive way.

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