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Master Thesis:

“Turkey’s Path towards Energy Transition”



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MATINA FRENTZOU

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List of abbreviations

TPAO	Türkiye Petrolleri Anonim Ortaklığı
IMF	International Monetary Fund
EÜAŞ	Elektrik Üretim A.Ş
TEİAŞ	Türkiye Elektrik İletim A. Ş
BOT	Build-Operate-Transfer
BOO	Build-Own-Operat
PKK	Partiya Karkerên Kurdistanê/ The Kurdistan's Worker's Party
TEDAŞ	Türkiye Elektrik Dağıtım A.Ş
EPDK	Enerji Piyasasi Düzenleme Kurumu or EMRA
COP	Conference of the Parties
NDK	Nükleer Düzenleme Kurumu
TETAŞ	Türkiye Elektrik Ticaret ve Taahhüt A.Ş
RE	Renewable Energy

Research Methodology

Research Questions

1. Why is the implementation of the energy transition significant both globally and in the Turkish region?
2. How is Türkiye affected, but also how do movements and actions in the energy sector affect internationally, from the country's independence until today?

Aim

The aim of this paper is to analyze the concept and the aspects of the energy transition with a focus on the transition course of Türkiye's in order to arrive at certain conclusions and possible perspectives in this field, not only because of the global tendency towards a sustainable future, but also due to its geopolitical importance in the wider region and worldwide.

Methodology

As concern as the methodology followed, the sources utilized for the completion of this thesis, they consist of books, articles both scientific and journal. The bibliographic sources were helpful for writing the transition in a historical perspective (1923-2001). The articles contributed to the finding of information for the period 2003 and after. Although, there were some difficulties. To begin with, the books for the energy transition from 2003 were zero. Also, some governmental websites were out of order. So, the information was found in other sources. The latter are approved publications. What is more, to make friendlier this dissertation, diagrams were incorporated. Instead of Turkey, it is used the word Türkiye. This is the new official name of the country from 2021. Lastly, the laws and plans of Türkiye and other organizations are written with italics. The aim is to be separated and be more evident.

Introduction

During the human history, have taken place several energy transitions. It can be said that this development is natural. The role of the countries is crucial in the sense that they implement relevant policies to achieve this transition. Each transition comes with several advantages and drawbacks. One of the primary areas which accepts the negative effects is the environment- ecosystem. In the mid-1970s it was obvious that the burning of fossil fuels had caused serious damage in the environment and ozone layer. In the eve of the second millennia, the extensive use of oil, natural gas and coal for energy generation caused an overheat of the planet. Now, it was necessary for policies to be implemented to reduce the global temperature. The protagonists were going to be the countries and regional and international organizations. The key? The implementation of energy transition policies.

One of the countries which targets to tackle with this climate change is Türkiye. This country has passed many energy transitions in its historical path. From 1923 till nowadays, the governments tried to design and implement energy transition policies for ameliorating the status and tackling with the climate change. Even though the efforts of the pre- Erdogan era were not very successful, under Recep Erdogan's leadership, the progress is worth mentioning. This is the argument of this thesis.

The thesis consists of four chapters and some single titles. At first, there is the theoretical framework (Chapter 1) in which the meaning and the principal characteristics of relevant terms are presented. This mention is necessary for informing the reader about the general context to understand the main body. The second chapter with the title "The chronicle of Turkish energy transition (1923-2003)" examines the energy transitions of this state from its independence to the year before the election of Recep T. Erdogan. In this chronicle, the reader will have the opportunity to watch the progress of this transition. In Chapter 3 with the title "The energy transition during the Recep T. Erdogan period of authority (2003-today)" the increasing of the design of energy transition policies are presented. This chapter covers the premiership and the presidency, both terms. The fourth Chapter includes the conclusion. Additionally, there is an effort to forecast the future of energy transition and possible challenges. In the end, there are the references and the presentation of bibliography.

Chapter 1

The energy transition in a theoretical framework

Energy is perhaps one of the most vital elements for human lives. The energy transition is a concept of timeless importance. It is no coincidence that it is a route towards a more sustainable future. But what exactly is the energy transition? How is it possible? What is included? Have there been such transitions in the past?

Initially, various definitions have been given for the term energy transition. O'Connor states that it is a particular set of significant changes in the use of energy in a society¹. According to the rating agency S&P, *the energy transition refers to the global energy sector's shift from fossil-based systems of energy production and consumption — including oil, natural gas and coal — to renewable energy sources like wind and solar, as well as lithium-ion batteries. technological progress and the friendly feelings of society towards a sustainable future. The transition is accompanied by structural and permanent changes in energy distribution, demand, prices, and aims to reduce greenhouse gas emissions through the disappearance of carbon dioxide. The mass introduction of electric public transport and energy storage drives the transition*².

The IAEA claims that the transition to "clean" energy *means shifting energy production away from sources that contribute to worsening the greenhouse effect (fossil fuels) to sources that emit little or no gases (wind, water, sun)*. This transition was agreed in the Paris Agreement, a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris on 12 December 2015. It entered into force on 4 November 2016. Its goal is to keep the increase in global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit it to 1.5°C.

¹Peter A. O' Connor, "Energy transitions", *The Pardee Papers*, no. 12 (2010), 8, [12-PP-Nov2010.pdf \(bu.edu\)](#).

² "What is energy transition?", *S & P Global*, last modified February 24, 2020, [What is Energy Transition? | S&P Global \(spglobal.com\)](#).

The same agency also lists "clean" energy sources. Nuclear power is one of them. During its use, its facilities produce almost zero greenhouse gases. Nuclear power contributes to 10% of the world's electricity. There are 440 reactors in 30 countries. The number of reactors under construction in 19 states is 54. The nuclear reactor could produce energy continuously, unlike wind turbines or solar panels that need to be supported with energy, when there is an apnea, or the sun goes down. In addition, some reactors can produce other forms of energy such as hydrogen, while mobile reactors are very promising³. It can be said that nuclear energy contributes without doubt to the reduction of carbon-emissions⁴.

The UN defines renewable energy as that which comes from natural sources, which are renewed faster than they are consumed. In contrast, minerals, oil and gas are not renewable energy sources because their formation takes a long time. According to the world organization, the most common sources of energy are solar, wind, geothermal, hydroelectric, ocean and bioenergy. Solar energy is the most abundant of all sources and is readily available. Solar technologies can provide heat, cooling, natural lighting, electricity, and fuel. Solar energy is converted into electricity either with photovoltaic panels or with solar radiation concentrating mirrors. In fact, the cost of installing photovoltaics is small, while their life cycle reaches up to 30 years. Wind power harnesses the kinetic energy of the wind to generate electricity. The constructions that carry out the conversion are the wind turbines. This is a technology that has been developed in recent years and offers prospects for sufficient electricity production. Geothermal energy utilizes the thermal energy that originates from inside the earth. The heat is collected from tanks. The technology that performs the conversion of heat into electricity is proven and reliable. Hydroelectricity harnesses the energy of moving water from higher to lower levels. The use of hydropower reservoirs is multiple providing drinking water, water for irrigation, flood and drought control and energy supply. As a form of energy, it is affected by the rate of precipitation and drought, while the constructions that exploit it may negatively affect the ecosystem. This is why smaller hydroelectric structures are preferred, as they are friendlier to the environment and local communities. The ocean energy is produced by the movement of the sea and the

³ Nicole Jawerth, "What is clean energy transition and how does nuclear power fit in?", International Atomic Energy Agency, 2020, [What is the Clean Energy Transition and How Does Nuclear Power Fit In? | IAEA](#).

⁴ Taner Yildiz, " Turkey's energy economy and future energy vision", *Turkish Policy Quarterly* 9, no.2 (2010), 16

technology to harness it is recent. It can provide electrical or thermal energy. Finally, bioenergy comes from biomass, i.e., dead organic materials that have been accumulated at a site such as wood and manure. They are used in poor provinces in the developing world for heating, lighting, cooking, etc. It is not such a "clean" form of energy, because it produces greenhouse gases in a small amount. Its use must be careful so as not to become harmful to the natural environment⁵.

But why should there be this energy transition? The author's opinion is that the answer is given clearly and concisely by the sheet of the revised directive on renewable energy sources of the European Commission in 2019. In the specific brochure, the reasons mentioned are the fight against the climate crisis, the reduction of air pollution, the possibility for households, communities, and businesses to become producers of clean energy, the achievement of energy autonomy and security and the creation of more jobs⁶. In other words, the energy transition is a necessary condition for addressing environmental challenges and their consequences for human communities and the ecosystem.

The typology of transitions can be defined on two axes: the first concerns the distinction between spontaneous or autonomous and, organized/goal-oriented transitions. The first axis includes electrification and the transition from cart and horse to automobiles and the second includes the Green Revolution in the primary sector and the transition from coal to gas in the Netherlands⁷.

Another typology is based on the recognition of the degree of complexity of the transition, i.e., whether it is simple or complex. What it will be depends on factors such as the number of distinct groups, stakeholders, any disagreements, and the influence of externalities. Simple was the transition from coal to gas, medium scale from the cart to the automobile and large-scale was the discovery of fire and the cultivation of the land.

⁵ "What is renewable energy?", *United Nations Climate Actions*, accessed: 15 July, 2023, [What is renewable energy? | United Nations](#).

⁶ "The revised renewable energy directive 2019", *European Commission*, accessed: 20 July, 2023, [directive renewable factsheet 0.pdf \(europa.eu\)](#).

⁷ Jeroen Van den Bergh, Frank Bruinsma, "The transition to renewable energy: background and summary," in *Managing the transition to renewable energy: theory and practice from local, regional and macro perspectives*, eds. Jeroen C.J.M. van den Bergh & Frank Bruinsma, (Chicago: Edward Elgar Publishing Inc 2008), 2.

The management of the transition is also included in the theme of the energy transition. Since every transition, as a state of change, involves risk and uncertainty, its management is an important task. A very relevant term which is linked to the risk is the energy security. This is a term not so universally accepted in its meaning. There are differences in perceiving energy security between several actors- private and public. For example, energy security is perceived differently by a state, by an organization, by a politician or a private company⁸. Although, the debate about its exact meaning has not ended, nevertheless the most comprehensive and concise definition is given by the International Agency Energy (IAE). According to IAE, *energy security is not just about having uninterrupted access to energy, but also about securing energy supplies at an affordable price. It is a topic of perennial importance and is once again high on the policy agenda because of the global energy crisis sparked by Russia's invasion of Ukraine. The surge in energy prices has been on a large enough scale to worsen considerably the global economic outlook, causing difficulties for households and industrial operations alike, leading many governments to recalibrate their policy priorities.* The same agency proposes some guidelines to tackle the problem of energy security. They include the reduction of energy poverty, especially in developing countries in which the citizens pay more money for less than the developed world energy services and the reduction of the capital cost of energy infrastructure in the developing countries. Also, another guideline is to manage the reuse of the existing infrastructure, which is necessary for providing energy even in rapid transition, while addressing the market failures contributes to the security establishment⁹.

It is imperative to mention one more aspect: the speed of the transition. In an article, a distinguished professor in the Department of Environment and Geography at the University of Manitoba, Vaclav Smil, presents the view, accompanied by historical examples, that the energy transition is a long-term process. The process of transition is impossible to replace the existing organized energy production system soon, rather, it is a work that will last for generations. Also worth adding is the trend that any progress in the use of renewable sources

⁸ Kacper Szulecki, "The multiple faces of energy security: an introduction," in *Energy security in Europe: divergent perceptions and policy challenges*, ed. Szulecki Kacper (Cham: Palgrave MacMillan, 2018),7. In the same book, the debate and the several aspects of energy security are presented in more detail.

⁹ "Energy security in energy transitions", *International Energy Agency*, accessed: 21 July, 2023, [Energy security in energy transitions – World Energy Outlook 2022 – Analysis - IEA](#).

in the West will be canceled out by the fossil fuels used by China and India. On the contrary, there is also the opinion that supports that the energy transition can be short¹⁰.

However, the development of energy technology and the transition process, in addition to its positive consequences, may raise political, economic, and social issues. Some of the negative effects are unemployment in fossil fuel industries, energy insufficiency, energy poverty, energy access, climate change and energy resources to exploit for future generations. Therefore, recognizing the above issues, the concept of energy justice emerged.

Though, what is energy justice? According to the University of Sussex, *energy justice is a multi-layered, human-centric theoretical approach that challenges injustice and inequality in the energy sector. It does this by recognizing who should have a say when energy systems are being designed and deployed, and what the implications of such systems are and to whom. It aims to achieve equality between social, economic, and political participation in the energy system and, ultimately, make the whole system more ethical.*

It continues mentioning that *energy justice adds a human dimension to the energy system, which has been traditionally considered from a more technological and economic perspective. Energy justice therefore poses a central question: how can justice theory help people make meaningful decisions about the production, delivery, use, and impacts of energy? In answering this question, energy and technology must be assessed with long-standing notions of virtue, utility, happiness, welfare, freedom, distributive justice, and procedural justice*¹¹.

Humanity has experienced a series of energy transitions. Until the 19th century, the main source of energy was wood, biomass for heating and cooking and muscle power for kinetic energy. Also, for the transports, carts and sub-balances were used. However, due to increased demand for existing sources, shortages occurred in the market. The result was an increase in their price, and they became more difficult to obtain. In this context, countries such as Great Britain looked for cheaper sources of energy to support their development. Coal offered this alternative. At the same time, the technological progress that allowed the use of the specific

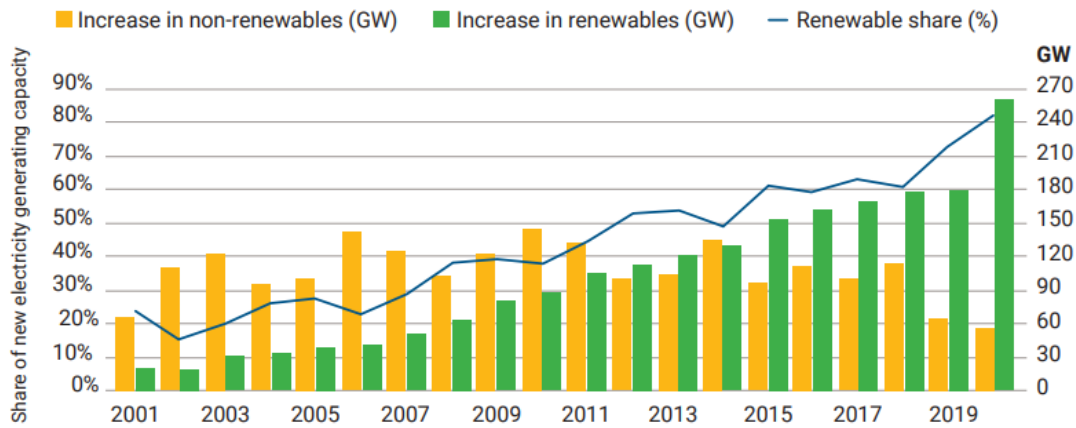
¹⁰ Vaclav Smil, "A sceptic look at alternative energy", *IEEE Spectrum*, June 28,2012. [A Skeptic Looks at Alternative Energy - IEEE Spectrum](#).

¹¹ "What is energy justice?", Blog- *University of Sussex*, August, last modified July 2023, [What is energy justice? - University of Sussex](#).

energy source, such as the steam engine, had been completed. Coal was the main form of energy until the beginning of the 20th century¹².

In 1859, Edwin L. Drake built the first oil pumping station for commercial use in Pennsylvania, USA. Its original use was for lighting (oil lamps). Although its widespread use would take place a century later, the foundations for a new energy transition had nevertheless been laid. The development of the automobile industry increased the demand for oil, and gradually electricity and oil replaced coal. After the war, along with oil, natural gas began to be used for heating. The development of pipeline technology contributed to its popularity. Also, since the 1950s, the role of nuclear energy in electricity production began to grow. Finally, with the advent of the 21st century, the value of renewable energy sources as environmentally friendly sources to replace fossil fuels gained ground. Now, the energy transition is inextricably linked to the comprehensive use of renewable energy sources¹³.

FIGURE 1. RENEWABLES NOW MAKE UP THE MAJORITY OF ANNUAL POWER CAPACITY ADDITIONS



Source: IRENA

Figure 1 Renewables from 2015 make up the majority of annual power capacity (Source: IRENA)

¹² Bhutada Govind, "The 200-year history of mankind's energy transition", *World Economic Forum*, April 13, 2022. [The world's energy transitions: a history told in infographics | World Economic Forum \(weforum.org\)](https://www.weforum.org/articles/energy-transition-history).

¹³ Ibid.

Contrary to those emphasizing the longevity of energy transitions, there are several cases which show that this transition can be short-termed. For example, it took a decade (1946-1955) for Kuwait to achieve the transition to crude oil. The transition to nuclear power in France took almost a decade (1947-1952)¹⁴. As concern as end-user devices, it has been proved historically that the transition is rapid. The case of Indonesia is worth mentioning: this Asian country managed to complete the transition to liquified petroleum gas stoves in three years from 2007 to 2010, while in the United States the spread of air-conditions demanded almost thirty years (1947-1970)¹⁵.

A new concept for tackling with the climate change is the Circular Economy (CE). For being understandable this concept it should be noted that the current economic system is linear, namely there is an extraction of raw materials from the nature, then they are turned into products and lastly, they are discarded as a waste. The CE does the contrary. Its target is to minimize waste with the construction of durable products, the recycling of material waste and the promotion of the use of renewable sources. It could reduce the GHG emissions by 49% by 2050. Regarding the implementation of CE policies, there is a lack of progress. The basic reasons are the inefficient information, the small or zero funding and the time it takes the change of linear to circular economy. However, the last decade there is a widespread of these policies. Some countries that have made progress are Ghana (urban waste management), Mexico (training), Vanuatu, The Netherlands and Austria (consumption of circular products). Supporters in this effort for developing CE are the UN, the governments, and stakeholders-businesses¹⁶. Undoubtedly, it is evident that CE is included in the concept of energy transition to a "greener" future.

¹⁴ Benjamin J. Sovacool, "The history and politics of energy transition: comparing contested views and finding common ground". *Wider Working Paper*, 2016 /81, 5-6.

¹⁶ United Nations Development Program, " What is circular economy and why does it matter?", last modified April 24, 2023, [What is circular economy and why does it matter? | Climate Promise \(undp.org\)](https://www.undp.org/en/circular-economy)

Chapter 2

The chronicle of Turkish transition

2.1 The energy transitions of Turkey (1923-2003): The failed efforts (1923-1945)

In the summer of 1923, with the Treaty of Lausanne, the Republic of Turkey was established. The Turkish economy was mostly agrarian. This means that the main energy was that of carts, horses, and farmers. The economic problems after the dissolution of the Ottoman Empire and the willingness of the Turkish president Mustafa Kemal to make the economy like the western ones led to a policy of *industrialization within a closed economy*. This policy refers to the utility of the public sector to prepare the base for the private activity and stimulate growth in those sectors neglected by the private capital¹⁷. This policy had a liberal character, except the state intervention as concern as investments with great importance¹⁸.

When the global economic crisis hit Turkey in late 1920s, it hit it very hard. The Turkish economy had not been liberalized as planned. In 1931, the policy of etatism was adopted. It was one of the pillars of Kemalism and it promoted the concept of the importance of the private sector with the state intervention wherever the private one was unable to invest¹⁹.

Except the traditional ways of energy provision, during the same period, there were 48 plants of generating electric energy of 106,3 GW in Adapazari, Tarsus and Istanbul. The electricity industry was heavily dependent on foreign investment. It is no weird because the country was trying a liberal economy²⁰. In 1930s the belief of the benefits of a public energy industry started to prevail. In this context, some political decisions are included. In 1935, several public institutions were established like the EIE (Electric Power Resources Survey & Development Administration- Elektrik İşleri Etüt) with the task to carry out surveys and

¹⁷ Huseyn Ramazanoglou, "The politics of industrialization in a closed economy and the IMF intervention of 1979," in *Turkey in the west capitalist system: a study of industrialization, power and clans*, ed. Huseyn Ramazanoglou, (Vermont: Gower Publishing Company, 1985), 80.

¹⁸ Erik J Zurcher, *Turkey: a modern history* (New York: I.B. Tauris, 1993), 203.

¹⁹ *Ibid.*, 205.

²⁰ Erkan Erdogdu, "Regulatory reform in Turkish energy industry: an analysis", *Energy Policy* 35, no.2 (2007):

preparatory work to identify places for constructing hydro plant projects. Additionally, in 1938, a program of nationalization began and by 1944 almost totally the electric sector was under public control. What is more, during the WW2 the government of İsmet İnönü moved to the foundation of a Petroleum Office as a public institution belonging to the Ministry of Trade. The duties of this office were the purchase, the sale, and the stock of all types of oil and oil products required for the national needs²¹. Another resource of energy generation was coal. In the mines of Zonguldak, most of the coal was extracted.

2.2 The leap to a new era (1945-1983)

The end of WW2 found Turkey by the side of the winners, although for the biggest part of it the country holds a neutral position. The base of the economy continued to be agrarian, and the energy mix traditional. However, the actions of the previous period, the strategic position of Turkey in the environment of the Cold War and the overall development mostly in the West benefited the Turkish side.

In the 1950s, the booming of the national economy commenced²² and at the same, the leap towards a different future of energy generation. The government of the Democratic Party, with Adnan Menderes as its leader, knew that the economic development in an agrarian country should start from the land. So, the government policies benefited the farmers and the landowners. They were provided with cheap credit. This money was used for buying machinery. They were found by the government, which exploited the importance of the country in a bipolar world and the US aid in the same context. The results were positive as the enlargement of cultivation hectares took place. Specifically, these hectares from 14, 5 million in 1945 reached the 22,5 million in 1956. Also, the farmers' income rose²³.

In the same decade, other developments accelerated the energy transition. To begin with, the Turkish elite, which had gained a lot of money during the 1940s, started to invest its earnings in the national economy. Furthermore, the type of family business appeared. Moreover,

²¹"Oil production in Turkey" *PETFORM*, accessed: 30 July, 2023, [Oil Production in Turkey | Petform](#) .

²² Zurcher, *Turkey: a modern history*, 232.

²³ *Ibid.*, 235.

infrastructure projects were built, such as roads. Particularly, 5.400 km of well-built roads were constructed replacing the 1.600 km of bad-built ones, while the importation of trucks and cars facilitated the internal trade and the movements²⁴.

The Turkish government began to visualize the utility of nuclear energy the same time. There are some reasons for this visualization: in the US this new form of energy started to be used for electricity generating purposes. On 25 March 1957, the EURATOM Treaty was signed establishing the European Energy Atomic Community. All those developments were representative of the new era the humanity experienced. So, in 1954 the Atomic Energy Commission was founded, while in 1957 Turkey became a member-state of EURATOM.

As concerns as the oil sector, the TPAO was established the same year by Law 6327. Its duties were the performance of hydrocarbon exploration, drilling, production, refinery, and marketing activities. The target was the reduction of oil and natural gas imports²⁵. Disappointedly for the Turkish authorities, the process of privatization, liberalization and economic recovery was not durable. In 1958, inflation reached 20% and the elite did not successfully invest its money. The government failed at privatizing the large state companies as well²⁶. Before the end of 1950s, the Turkish economy was in a tragic situation and the government was so desperate that accepted the terms of IMF and gained a new loan from the US, the European countries and IMF²⁷. In this turbulent situation, the Armed Forces took the control of power organizing a coup d'état. In September 1961, the toppled Turkish prime minister was executed by hanging.

In the 1960s, the efforts of energy transition continued, but with a slower rhythm. In the term of İsmet İnönü's government (1961-65) the Ministry of Energy and Natural Resources was established (1963). It was responsible for the national energy policy²⁸. It is worth mentioning the fact that the Turkish governments made efforts concerning the nuclear energy, such as

²⁴ Ibid., 235-236.

²⁵ "About TPAO", Türkiye Petrolleri Anonim Ortaklığı (TPAO), accessed: 11 July 2023, Türkiye Petrolleri A.O. | TPAO.

²⁶ Zurcher, *Turkey: a modern history*, 236.

²⁷ Ibid., 240.

²⁸ Erdogdu, "Regulatory reform in Turkish energy industry an analysis": .3

they tried unsuccessfully to build a reactor, while two research reactors were commissioned in Çekmece and Istanbul Technic Universities²⁹.

The biggest leap took place in the 1970s. In 1970 the Turkish Electricity Administration was established which would have the total monopoly, except the distribution, which was a duty of local administrations³⁰. The main priority of the governments was the electrification of Turkey. This policy task included the urban and rural electrification with the construction of a network of transmission³¹. While the developments seemed to benefit the country, a global energy crisis broke out. The first oil crisis as it is known of 1973-74, led to a quadrupling of the price of oil on the international market. The Turkish dependence of oil negatively affected the national economy because the crisis raised the bill of imports paid in US dollars³². In this international and national context, it is not weird the movements of TPAO. In 1973 and 1974, this agency published licenses for oil research in some blocks into the Greek continental shelf. Those licensed blocks were in the north-eastern and south-eastern Aegean Sea. The reason was primarily the energy insecurity Turkey faced because of the oil crisis³³. The Aegean Sea was a very good alternative for drilling oil and reduces or eradicates the imports of that source of energy. As a result, a friction with Greece was provoked. The Cyprus Issue³⁴ deteriorated the bilateral relations as well. Additionally, the Iraq-Turkey Pipeline Agreement was signed in 1973. The main provision of this treaty was that the oil extracted from Kirkuk (northern Iraq) would be shipped to international markets via Turkey. In 1976, the Kirkuk-Ceyhan oil pipeline was commissioned. This project was another effort of the Turkish government to differentiate suppliers and enhance its energy security.

²⁹ "Turkey's energy transitions: milestones and challenges", World Bank, no. ACS14951 (2015), 119.

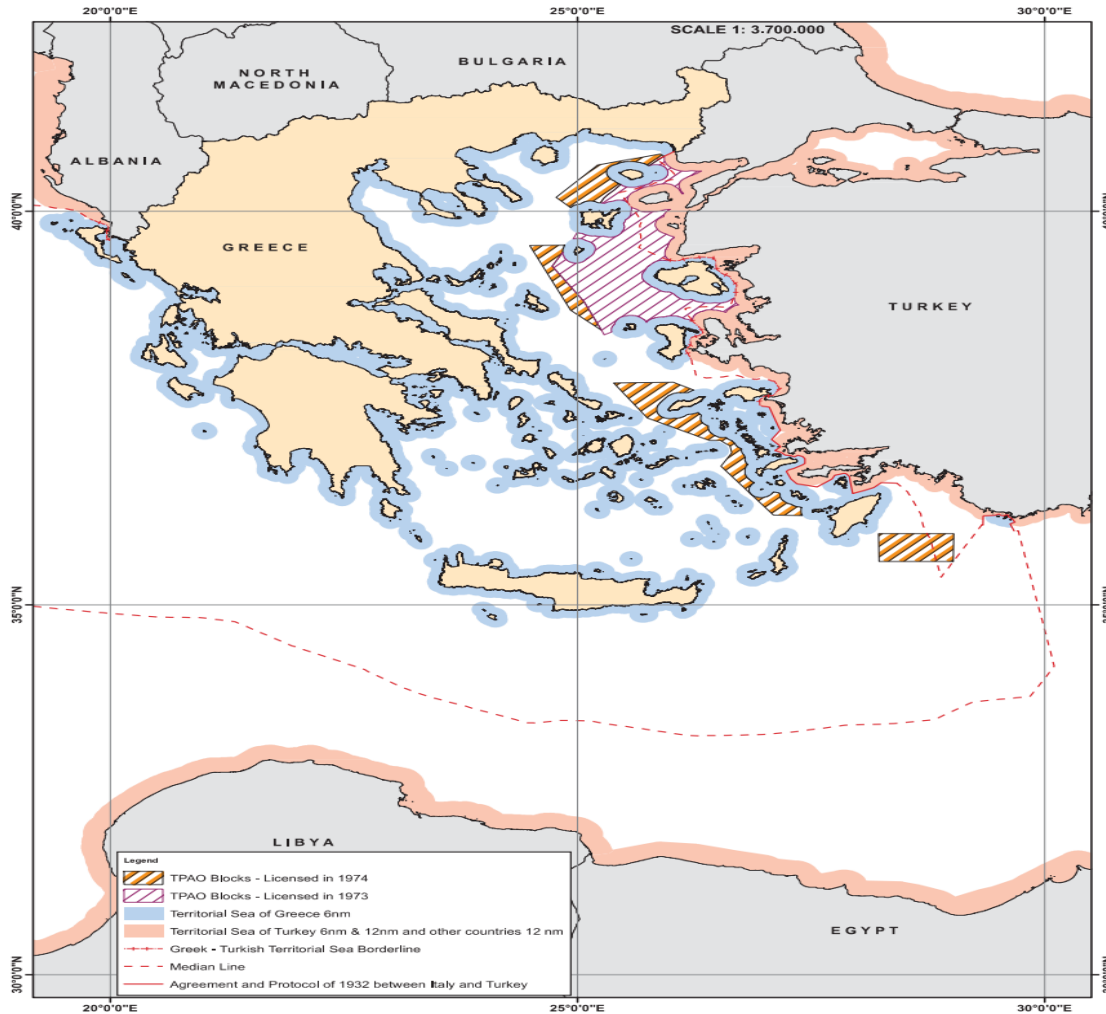
³⁰ Erdogdu, "Regulatory reform in Turkish energy industry an analysis": 4.

³¹ "Turkey's energy transitions: milestones and challenges", 57.

³² Zurcher, *Turkey: a modern history*, 280.

³³ For a visual information, watch the map below. MFA, accessed: 08 August 2023 [map4 \(mfa.gr\)](#).

³⁴ It refers to the double Turkish invasion of Cyprus in the summer of 1974.



ΧΑΡΤΗΣ 4 – 1974: Δημοσίευση νέων αδειών ΤΡΑΟ σε Αιγαίο και μεταξύ Ρόδου και συμπλέγματος Καστελλορίζου

Στις 18 Ιουλίου 1974 δημοσιεύθηκαν στην τουρκική Εφημερίδα της Κυβέρνησης νέες αποφάσεις που έδιναν άδειες προς την ΤΡΑΟ για εξερεύνηση κοιτασμάτων πετρελαίου σε ελληνική υπαλοκρηπίδα. Οι αποφάσεις αυτές αφενός επέκτειναν τις περιοχές των αδειών του 1973 δυτικά των νησιών Σαμοθράκη, Άγιος Ευστράτιος, Λέσβος, Ψαρά, Αντίφαρα και Χίος και αφετέρου έδιναν άδεια εξερεύνησης για πρώτη φορά στο νότιο Αιγαίο, βορειοδυτικά και δυτικά των νησιών Ικαρία και Δωδεκάνησα, καθώς και σε μία περιοχή νοτιοανατολικά Ρόδου.

Figure 2: Map of Publication of new TPAO licenses in the Aegean and between Rhodes and the complex of Kastellorizo (1974), (Source: Ministry of Foreign Affairs of the Hellenic Republic)



Figure 3: Map of the Kurdistan- Turkey pipeline (Source: McDaniel & Associates Consultants, Conflict Monitor by IHS Markit)

In 1978-1980 the second oil crisis stroke the Turkish economy. It caused problems with the foreign currency and recession. The main policy for tackling this problem was a mix of imposing import restriction on oil for industrial blocks and periodically cut-offs on generating electricity. The consequences were bad with the thriving of black market and an inflation³⁵. The government of Bülent Ecevit, under severe pressure, signed a loan accompanied by reforms. Some of them were the freeing of interest rates, raising the prices, cutting government expenditure, abolishing import and export controls and cutting subsidies³⁶. The successor of Ecevit, Süleyman Demirel, tried to follow this policy. One of the protagonists was the Under-Secretary of Economic Affairs Turgut Özal. He launched the reforms program. Though the resistance was huge. The unions organized strikes, which were accompanied by clashes between the demonstrators and the police. The outcome was negative³⁷. The government could not implement this package. In this turbulent period and for another one time, the Armed Forces organized and executed a successful coup d'état

³⁵ Zurcher, *Turkey: a modern history*, 280.

³⁶ *Ibid.*, 281.

³⁷ *Ibid.*, 282.

against the prime minister in September 1980. They were determined to implement this liberal package of reforms³⁸.

³⁸ Şevket Pamuk, "Economic change in the twentieth- century Turkey: is the glass more than half full?" in *The Cambridge history of Turkey: Turkey in the modern world*, ed. Resat Kasaba, Vol. 4, (Cambridge: Cambridge University Press, 2008), 286.

2.3 The path towards liberalization and diversification (1983-2001)

In December 1983, Turgut Özal was elected prime minister. Its main target was the total restructure of the national economy. The program included the balance of payments, the battle against inflation and an export-orienting free-market economy. The means to achieve those goals were the devaluation of lira, the making of Turkish exports more competitive to foreign markets, the decrease of overconsumption and the raising of interest rates³⁹. The liberalization of economy concerned the energy sector as well with clear example of the electricity sector⁴⁰. Özal publicly declared his intention to break the state monopoly of public businesses which were insufficient and not a target of investments⁴¹.

The restructuring of the energy sector in order to attract investors followed four models of project delivery. The first one is the TOOR model. This model facilitates the transfer of public assets to private management, along with new investments by the private sector. The second model was that of Autoproduction, namely the ownership and the operations of power plants by industrial companies, primarily for meeting their demands in electricity. The third model was the BOT which involves three stages: the first is the financing and building of an asset, for example, power plants. Secondly, the sale of the product to a public company after a long-term agreement. Lastly, the transfer of this asset to a public entity at the end of the contract period. The fourth model was the BOO in which the government was choosing the investors of the projects with the maximum importance. The last model was the result of the willingness of Ozal's government to bypass the legal issues regarding the privatization program on electricity⁴².

The challenge of energy transition was not absent in the 1980s. The government moved towards this transition with a series of actions. The South-eastern Anatolia Project was a project of constructing dams and hydropower plants in south-eastern Turkey for the

³⁹ Zurcher, *Turkey: a modern history*, 307.

⁴⁰ "Turkey's energy transitions: milestones and challenges", 19.

⁴¹ Zurcher, *Turkey: a modern history*, 310-311.

⁴² "Turkey's energy transitions: milestones and challenges", 21.

production of electric energy and the increase of irrigation hectares⁴³. It is the largest and costlier project of Turkey. It is in 9 provinces, and it is expected to supply the energy sector with 27 billion kilowatt hours⁴⁴. What is more, the construction of a natural gas pipeline with the USSR was planned to interior coal and lignite be replaced⁴⁵. Another achievement was the construction of Kizildere Geothermal Power Plant in 1984. Its capacity was 17,5 MW⁴⁶. The effort of achieving energy security did not decrease the aggressiveness of the Turkish side. In March 1987, the oil exploration vessel named *Sismik* was ready for a survey in the Aegean waters. This development annoyed the Greek government and the armed forces of the two countries were placed on alert. The *Sismik crisis*, as this crisis is known, was terminated with the announcement of the Turkish president that the above vessel would conduct surveys only in Turkish territorial waters⁴⁷.

The Özal's period is characterized on the one part as a success. Particularly, the reforms helped accelerate the opening of the economy to the free-market⁴⁸, while the government managed to wiping out the black market and reducing the inflation⁴⁹. On the other hand, in the late 1980s the situation of the economy was deteriorated. The main problems were the wide deficits of the public sector, the war against PKK and the heavy domestic and external borrowing. Also, the inflation rose up again to 50%⁵⁰.

In the 1990s, the effort for reforms and energy transition policies continued. The coal sector remained untouched. In the electricity sector there was a progress. In 1993, began the privatization of TEK. It was split into two separate enterprises, the Turkish Electricity Generation Transmission Co. and TEDAŞ. On the contrary, the Constitutional Court made this privatization impossible. The deadlock was surpassed in 1999 when the Turkish

⁴³ Zurcher, *Turkey: a modern history*, 307.

⁴⁴ Türkiye, Ministry of Industry and Technology, *The south-eastern Anatolia project*, accessed: 31 July, 2023, [GAP Regional Development Administration - What's GAP?](#)

⁴⁵ Zurcher, *Turkey: a modern history*, 309.

⁴⁶ "Turkey's energy transitions: milestones and challenges", 113.

⁴⁷ Richard Clogg, *A concise history of Greece*, (Cambridge: Cambridge University Press, 1992), 188.

⁴⁸ Pamuk, "Economic change in the twentieth- century Turkey: is the glass more than half full?", 288.

⁴⁹ Fikret Senses, "Short-term stabilization policies in a developing economy: the Turkish experience in 1980 in long-term perspective" in *Turkey in the west capitalist system: a study of industrialization, power and clans*, ed. Huseyn Ramazanoglou, 152.

⁵⁰Pamuk, "Economic change in the twentieth- century Turkey: is the glass more than half full?", 289-290.

Parliament passed a law that permitted the public utility services to be privatized⁵¹. Also, in the mid-1990s the energy transition to electricity was completed successfully. From now on, all the regions of the country had access to electricity. Regarding the renewable energy, there were few developments. The most important was the construction of the first wind power park in Izmir in 1998 when the prime minister was Mesut Yilmaz. The facility has 12 wind turbines for a total capacity of 7,2 MW and the owner is the enterprise Gucbirligi Holding, Inc⁵². In 2001, the whole capacity of the wind power plants increased to 18,9MW. Those plants were built by BOT conventions⁵³. Furthermore, at the end of 1999, the country could produce 820 MWthe of geothermal energy mainly from the plant in Denizli. Of the 820 MWthe, the 390 provided heat for 51.600 houses, the 100 provided heat for 45 hectares of greenhouses and the rest 330 used to provide hot water for 200 spas⁵⁴.

As well as the Turkish delegation took part in the talks which led to the sign of Kyoto Protocol in December 1997. The main purpose of this protocol concerns the developed and industrialized countries so as to reduce greenhouse gases. It created three categories of states depending on the greenhouse emissions. In the Annex I, there were 42 states and the EU. This Annex obliges them to reduce their emissions and to report any measures they take towards this route. In the Annex II, there were 23 states and the EU too. The countries in this category are obliged environment friendly technologies to developing states and to reduce their emissions. In the third category, the non-annex countries there were 154 states. The countries in this list have to reduce their emissions, to cooperate but they are not bound by the obligations like the above states⁵⁵. It is evident that binds the developed states because those have the principal responsibility for polluting the environment. Particularly, in its Annex II (the developed countries), this protocol sets emission reduction targets for 32

⁵¹ Erdognu, "Regulatory reform in Turkish energy industry an analysis", 5.

⁵² "Turkey's energy transitions: milestones and challenges", 112 and Lynd, Richard. 2003. *An energy overview of the Republic of Turkey*, Global Energy Network Institute, [Energy Overview of Turkey \(geni.org\)](https://www.geni.org). In World Bank report, it is referred that the total capacity was 8,7 MW. The author considered mentioning both numbers because she didn't find any other information from a reliable source.

⁵³ N.a, "Turkey's energy transitions: milestones and challenges", 112.

⁵⁴ Lynd, "An energy overview of the Republic of Turkey", Global Energy Network Institute, accessed: 25 August 2023, [Energy Overview of Turkey \(geni.org\)](https://www.geni.org).

⁵⁵ Türkiye, Ministry of Foreign Affairs, "United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol", accessed: September 20, 2023, [United Nations Framework Convention on Climate Change \(UNFCCC\) and the Kyoto Protocol / Republic of Türkiye Ministry of Foreign Affairs \(mfa.gov.tr\)](https://www.mfa.gov.tr).

states including the EU⁵⁶. Türkiye was placed in the Annex I and II even though it wanted to be in the Annex I. After discussions, in 2001, it was entered in the Annex I due to it had very low CO2 emissions, just 3,88T/capita in contrast with average emissions of the group of 14,37T/capita⁵⁷.

The crucial role of another resource, natural gas, became this period clearly evident. The government of Necmettin Erbakan, recognizing this new resource, signed a treaty with Iran for the transportation of natural gas via the Tabriz-Ankara pipeline. The project was commissioned in 2001 and in Turkey, BOTAŞ handles it. It is capable of carrying 14 bcm/year. Lastly, there were developments in the oil sector. In 1994, the government of Tansu Çiller signed an agreement with its counterparts of Georgia and Azerbaijan for the construction of a crude oil pipeline. The Baku-Tbilisi-Ceyhan pipeline was a reality. The commission of the pipeline became in 2006 and it can carry 1 million barrels of oil per day. It can be argued that a serious reason behind this project, except the willingness of the Turkish side to diversify its suppliers, was the negative economic effect the suspension of the transportation of Iraqi oil into Turkey had. The function of the Kirkuk-Ceyhan pipeline was suspended due to the oil embargo imposed by the UN against the Saddam Hussein's regime. It had a negative effect in the national economy, while it raised issues of violation of the energy (oil) security. Moreover, in 1998, the Turkish authorities adopted the automatic price for fuel oil. It was a step towards the free-market orientation of the oil energy sector aligned with the target of liberalization of successive governments.

⁵⁶ United Nations, “What is the Kyoto Protocol?”, accessed: September 20, 2023, [What is the Kyoto Protocol? | UNFCCC](#).

⁵⁷ Türkiye, Ministry of Foreign Affairs, “United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol”, accessed: September 20, 2023, [United Nations Framework Convention on Climate Change \(UNFCCC\) and the Kyoto Protocol / Republic of Türkiye Ministry of Foreign Affairs \(mfa.gov.tr\)](#).

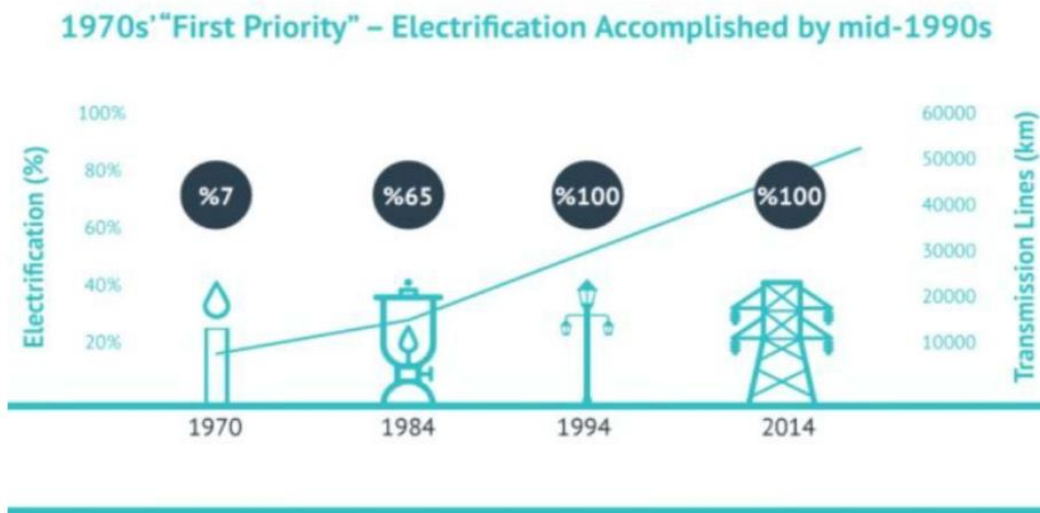


Figure 4: This diagram shows the development of electrifying Türkiye from the 1970s till 2014, (Source: World Bank)

In 1999, it was evident that the Turkish economy was not vital. The problems of inflation, slow economic growth, bureaucracy, and growing unemployment brought the IMF in the country. A new stabilization liberal program was implemented which led to a financial crisis in 2001. In the face of an overall collapse, Ecevit's government suspended the program and the decision of the devaluation of Turkish lira was taken⁵⁸.

As it is normal, the stabilization program affected the process of energy transition. The Turkish government passed two laws concerning the electricity and natural gas sector. The Electricity Market Law (Law 4628) was issued in March 2001. The target of this law was the establishment of a healthy and transparent electricity market combined with the delivery of sufficient and environmentally friendly electric power to the consumers. As well as there were provisions for the supervision and regulation of this market. The character of this law was liberal, and it reformed the electricity market⁵⁹. In April 2001 the Natural Gas Market Law (Law 4646) passed. Its target was to create a transparent, competitive and regulated market aligned with the EU's Directive on Natural Gas of 1998. What is more, the law provided that BOTAŞ which had the monopoly in the natural gas sector would be privatized till 2009, apart from gas supply and transmission. The law achieved the liberalization of the

⁵⁸ Pamuk, "Economic change in the twentieth- century Turkey: is the glass more than half full?" in *The Cambridge history of Turkey: Turkey in the modern world*, 290.

⁵⁹N.a, "Turkey's energy transitions: milestones and challenges", 66.

LNG market, the reduction of BOTAŞ monopoly, the privatization of distribution system and the completion of the legal framework among others⁶⁰. Another accomplishment was the creation of an independent regulatory authority, EMRA. It is responsible for performing controls over the energy market⁶¹. One negative development was the cancellation in July 2000, due to economic reasons, of the agreement to build a nuclear power plant in Akkuyu region, which could provide the country with 1.400MWe⁶².

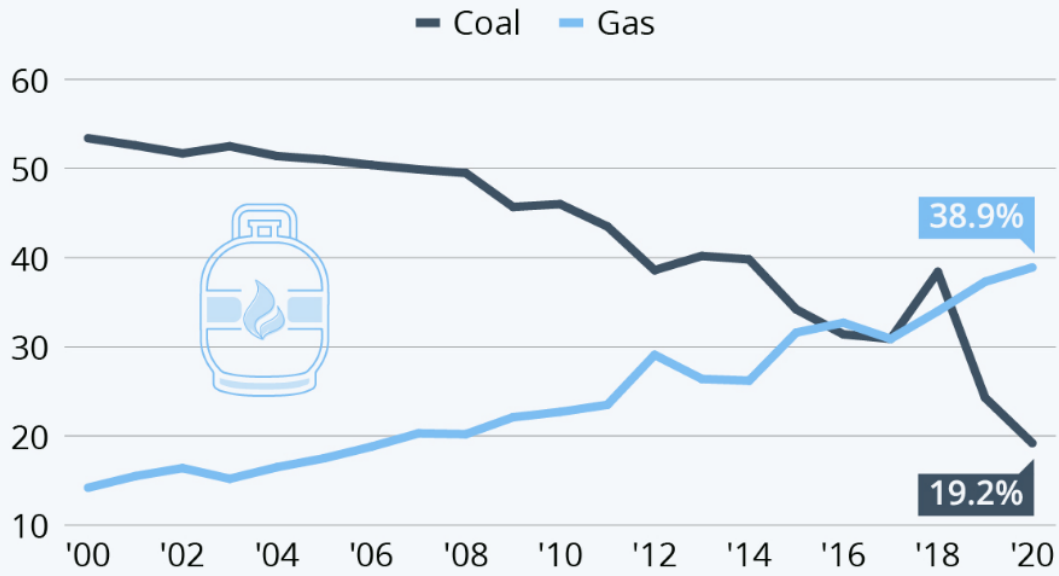
⁶⁰ N.a, “Turkey’s energy transitions: milestones and challenges”, 133-134.

⁶¹ N.a, “Turkey’s energy transitions: milestones and challenges”, 49-50.

⁶² Lynd, “An energy overview of the Republic of Turkey”, Global Energy Network Institute, accessed: 25 August 2023, [Energy Overview of Turkey \(geni.org\)](https://www.geni.org/en/energy-overview-of-turkey)

Natural Gas Quickly Outpacing Coal

Percentage of U.S. electricity made from natural gas and coal for each year



2020 figures are estimates

Sources: U.S. Energy Information Administration, Bloomberg



Figure 5: This diagram shows the development of the utility of natural gas in relation with coal, (Source: Statista)

Chapter 3

The energy transition in relation to the Erdogan presidency

3.1 The first premiership of Recep Tayyip Erdogan (2003-2007)

In the elections of November 2002, the Justice & Development Party (AKP) won with its leader Recep Tayyip Erdogan. The elections took place in a turbulent period characterized by a general crisis and slow progress in the transition to a greener energy production and the liberalization of the energy market. The new government promised to restore transparency and rebuild the economy.

The new perspective the AKP presented persuaded the Turkish society. However, Recep T. Erdogan did not become prime minister, because of a ban from participating in politics. The other important person of the party, Abdullah Gül, took the position permanently. After 116 days and having changed the law that enforced the ban, R. Erdogan was proclaimed prime minister in March 2003. A new era for Turkey, particularly in the energy transition, began.

In March 2004, a *New Electricity Strategy* was adopted. The target was the privatization of the electricity distribution sector by the end of 2006⁶³. Except the electricity sector, the Turkish government moved towards the renewable energy transition. So, the *Law on Utilization of Renewable Energy in Energy Generation* (Law 5346) was passed on 18 May 2005. The purpose of the law was the generation of electric energy from the expanding usage of renewable energy. As a result, the diversification of energy resources would be achieved to reduce greenhouse gas emissions. As well as, this generation would be environmentally

⁶³"Turkey's energy transitions: milestones and challenges", 23, 106-109 and A. Burak Dağlıoğlu et al., "Overview of the Turkish electricity market", *PwC*, (2015), 9, [untitled \(invest.gov.tr\)](#).

friendly, while it could create new jobs. What is more, this law concerned the certification of energy generation from these sources and the use of these sources as well⁶⁴.

This development was in correlation with the international environment. In 2002, the EU presented the Sixth Environment Action Programme with a duration from 2002 to 2012. This programme included some directions such as the amelioration of the legislation, the cooperation with businesses, the changing of citizens' behaviour in order to become more environmentally friendly and the calculation of environmental issues during the land-use planning and management. The climate change was recognized as the main threat. The way of combatting it was the reduction in the emissions of greenhouse gases. In the short-term, the target was the EU to achieve the provisions of Kyoto Protocol. Additional provisions concerned the protection of human health and the management of natural resources and the waste. An important fact of this plan was the provision that the candidate for accession states should follow a sustainable development policy⁶⁵. In 2004, the Kyoto Protocol was ratified by the Turkish side. Also, in December 2005, the COP hosted in Montreal, Canada, decided to extend the duration of Kyoto Protocol beyond its 2012 expiration date. The internal and external developments can explain why in 2005 the accession negotiations between EU and Türkiye were facilitated.

In this context, there were actions towards the renewable energy. When R. Erdogan took the position of prime minister, he tried to persuade the private factors to invest. The *Law on Utilization of Renewable Energy Resources for the purpose of Generating Electricity* (Law 5346) was passed. created a safety mechanism for renewable energy and called for investments in hydro, wind and solar energy.

On 2 May 2007, the *Energy Efficiency Law* (Law 5627) was published in the Official Gazette. The purpose of this law was to efficiently utilize the energy sources and to avoid waste, reduce the energy costs and protect the environment. Additionally, it provided the establishment of an Energy Efficiency Coordination Board with functions such as the preparation of national energy efficiency strategies, the approval of the projects prepared or

⁶⁴ "Law on Utilization of Renewable Energy Sources (2005),," *Laws Turkey*, accessed: 30 August 2023, [5346 Law on Utilization of Renewable Energy Sources \(lawsturkey.com\)](https://www.lawsturkey.com).

⁶⁵ "Sixth Environment Action Programme (2011)," *EUR-Lex Europa*, accessed: 25 September 2023, [EUR-Lex - 128027 - EN - EUR-Lex \(europa.eu\)](https://eur-lex.europa.eu/lex-128027-EN-EUR-Lex).

procured through companies and set and publish the fees for authorization certificates. Moreover, another provision was the publication of energy efficiency certification for buildings such as universities and other entrepreneurial ones. The price for electric energy, according to this law, would be the country's average electric wholesale price for the year before set by EMRA. As concern as the investment sector, it offered financial incentives for carrying out this efficiency policy⁶⁶.

Furthermore, another step to the renewable energy transition was the *Law on Geothermal Water* (Law 5686) which was accepted and published in the Official Gazette on 13 June 2007. The aim was the regulation of exploration, development, effective searching, producing, and protecting the geothermal and natural mineral water resources. Also, it set rules for the rightful ownership of the resources. Particularly, it put under state control the geothermal and natural mineral waters, while rights on those fields have real or legal persons with the provision of heritage. The exploration licence was defined for three years and for exploitation licences the validity will be for thirty years. In addition, this law provided that during exploration phase, the companies or persons have not the obligation of production. In conclusion, this law came to resolve the problems regarding the exploitation of geothermal energy, which stalled the period 1980-2003. It tried to utilize the rich Turkish soil taking into consideration the environmental protection with the establishment of an open market⁶⁷.

During the first premiership of Recep. T. Erdogan, the energy diplomacy was intensive. The targets of this diplomacy were the diversification of energy supplies, a standing request of the country, and the transformation of Türkiye into a regional energy hub. The government exploited the 1990s talks for an oil pipeline from the Caspian Sea to the Mediterranean Sea. The result of this movement was the construction of the Baku- Tbilisi- Ceyhan oil pipeline. The construction works began in spring 2003, it was completed in 2005 and it was commissioned in 2006. The main constructor on the Turkish side was BOTAŞ. The

⁶⁶ "5627 Energy Efficiency Law (2007)," *Laws Turkey*, accessed: 25 August 2023, [5627 Energy Efficiency Law \(lawsturkey.com\)](https://www.lawsturkey.com/5627-energy-efficiency-law/).

⁶⁷ "5686 Geothermal Resources and Mineral Water" (2007), *Laws Turkey*, accessed: 29 August 2023, [5686 Geothermal Resources and Mineral Water \(lawsturkey.com\)](https://www.lawsturkey.com/5686-geothermal-resources-and-mineral-water/) and Nusret Gungor, "The New Geothermal Law of Turkey and the Opportunities Provided to Entrepreneurs", World Geothermal Congress (25-29 April 2010) published on *Geothermal- Energy.org*, accessed: 30 August, 2023, [Turkey's New Geothermal Law and the Opportunities Brought to the Investors \(geothermal-energy.org\)](https://www.geothermal-energy.org/turkeys-new-geothermal-law-and-the-opportunities-brought-to-the-investors/) .

inauguration event took place in Sangachal Terminal in Azerbaijan by president Ilham Aliyev, the Georgian president Mikhail Saakashvili and the Turkish president Ahmet Sezer. In the event they were present, the Kazakh president Nursultan Nazarbayev and the United States Secretary of Energy, Samuel Bodman⁶⁸.

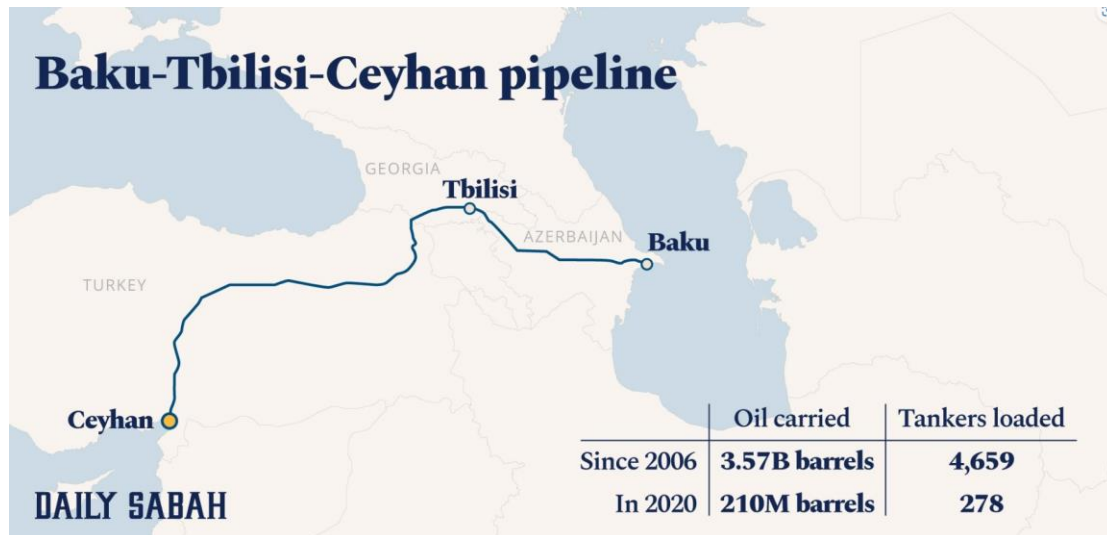


Figure 6: Baku-Tbilisi- Ceyhan pipeline, (Source: Daily Sabah)

The distance of the pipeline is 1.770 km. It starts from Sangachal Terminal near Baku; it crosses Georgia and terminates at the Ceyhan Marine Terminal in Türkiye. It can transport 1 million barrels/day⁶⁹. This project was funded by the World Bank, the European Bank for Reconstruction and Development and a number of other financial institutes. Though, a project like this raised concerns. The most notable was the bypassing of Armenia, which could marginalize it from the energy politics in the Caucasus region. Secondly, Russia as well as had problems because its interests in the region could be marginalized. On the contrary, Ilham Aliyev wanted this pipeline to exclude Armenia due to the bilateral rival over Nagorno- Karabakh Question.

⁶⁸ Richard Boucher, "Opening of the Caspian Basin Pipeline", Press Statement U.S. Department of State, 2005/552, Washington DC, 25/05/2005, accessed: August 31, 2023, [Opening of Caspian Basin Pipeline \(state.gov\)](https://www.state.gov/opening-of-caspian-basin-pipeline) and "Presidents of Azerbaijan, Georgia and Turkey inaugurate BTC", *BP*, 25/05/2005, accessed: August 30, 2023, [Presidents of Azerbaijan, Georgia and Turkey Inaugurate BTC | News | Home \(bp.com\)](https://www.bp.com/news/home/press-releases/presidents-of-azerbaijan-georgia-and-turkey-inaugurate-btc).

⁶⁹ "Baku- Tbilisi- Ceyhan Pipeline", *SOCAR*, accessed: August 24, 2023, [Baku-Tbilisi-Ceyhan Pipeline \(socar.az\)](https://www.socar.az/baku-tbilisi-ceyhan-pipeline).

Another progress was evident in the natural gas sector. Again, the government utilized the Turco- Russian discussions in the late 1990s for the completion of the natural gas underwater pipeline named Blue Stream. The inauguration ceremony was organized at the Durusu Gas Station on 17 November 2005. The sales agreement between BOTAŞ and Gazprom had a duration of 25 years. This 1.213 km pipeline starts from a gas plant in Stavrai Krai region in Russia, passes through the Black Sea and terminates to the Durusu station in Turkey. Its maximum discharge is 16 bcm/year.

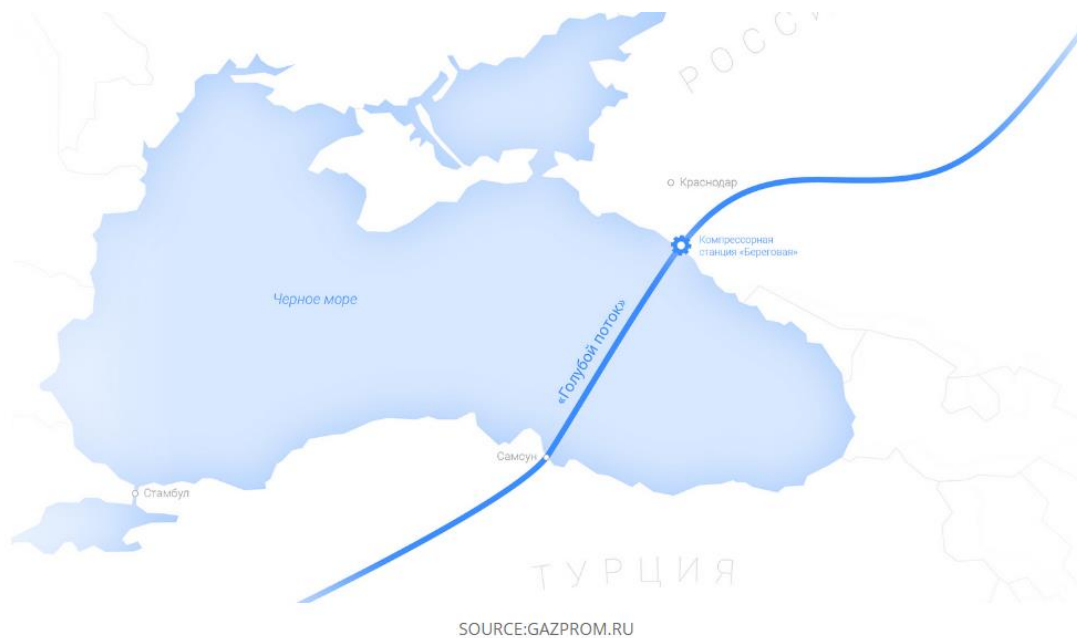


Figure 7: The Bluestream pipeline, (Source: Gazprom.ru)

Along with the BTC pipeline, in late 2006, another pipeline project started to bear fruits. The first deliveries of natural gas from Shah Deniz field in the Caspian Sea to Erzurum in Turkey had begun. The South Caucasus Pipeline, or Baku- Tbilisi- Erzurum pipeline, was a reality. It is parallel to the other crude oil pipeline. It crosses Georgia as well, which can be benefited from this flow. It carries 24 bcm/year of natural gas.

Furthermore, the energy affairs brought together Greece and Turkey. The Turkish side was positive to the energy collaboration with the neighbouring countries. The natural gas pipeline which connects Karacabey (Turkey) with Komotini (Greece) was inaugurated in September

2007. It was the result of a bilateral intergovernmental agreement between BOTAŞ and DEPA in 2002 and it can carry 11 bcm/year.

In the same period, Turkey was in front of a political crisis. The main cause was the choice of the prime minister of his candidate for the presidential elections. This candidate was Abdullah Gül. This choice caused reactions from the secularist opposition because he was an Islamist. So, general elections were announced, and Recep T. Erdogan won again. It can be safely concluded that it had the chance to continue the policies for energy transition.

At this point, which are the main conclusions of R. Erdogan's policy towards the energy transition? First things first, it is undeniable that the new prime minister wanted to accelerate the energy transition. It is showed by the laws his government passed. Not only they continued the liberalization of the energy market but also gave a new boost to the renewable energy. What is more, with the appropriate legislation, tried to solve enduring problems of the energy sector such as the hesitation and lack of private investments. The investment incentives targeted that pathogenesis. Also, Recep Erdogan followed the energy policy of his predecessors. Turkey should be an energy hub in the MENA and Eastern Mediterranean regions. At parallel, due to the national development, mass flows of cheap oil and natural gas were necessary. The first government of Erdogan achieved a lot in the sectors of energy diplomacy and security.

3.2 The second Recep T. Erdogan's premiership (2007-2011)

The new Erdogan's government continued the demanding task of energy transition. In 2008, the introduction of a new cost-based energy pricing mechanism was implemented. This move facilitated the privatization program as it pushed it a step beyond.

One other notable policy was the introduction of nuclear power legislation. Specifically, a new momentum to this sector was given with the pass of *Law on the Construction & Operation of nuclear Power Plants* (Law 5710) in November 2007 right after the elections. This law gave the right to TAEK to choose the company which it will construct and operate the nuclear plants and put the standards for such a cooperation. Any sign of contract would be completed after the approval of a Council of Ministers. Also, it regulated the process of electricity production. The energy will be purchased by TETAŞ under the agreed conditions. TETAS would sell the energy to other entities every year with a retail or wholesale prices. Provision was taken for the completion of the procurement the enterprise is obliged to decommission and operate the power plant under the criteria of TAEK⁷⁰. Worth noticing is the fact that within the framework of this law, public businesses after an assignment by the Ministry can take part to the nuclear sector at the same way with the private ones.

In 2008, the Turkish government wanting to proceed the national nuclear program called for bids from companies for building and operating a nuclear power plant in Akkuyu. Additionally, in February 2008 an effort was evident for the construction of a second nuclear plant in the city near the Black Sea, named Sinop along with a nuclear technology centre. The reason behind the choice of this place was the appropriate environmental conditions, the cold weather, which can easily cool the reactors⁷¹. Though, the Akkuyu plant was the main target for this period. It is natural that all the efforts focused on this project. Indeed, in June 2009, two agreements were signed between the Russian nuclear energy company Rosatom and the Turkish state. In May 2010, the Russian and Turkish leaders signed an intergovernmental agreement for Rosatom to build under the BOO contract this plant.

⁷⁰ "5710 Construction and Operation of Nuclear Power Plants (2007)," *Laws Turkey*, accessed: August 20, 2023, [5710 Construction and Operation of Nuclear Power Plants \(lawsturkey.com\)](https://www.lawsturkey.com/5710-Construction-and-Operation-of-Nuclear-Power-Plants/) .

⁷¹ "Nuclear Power in Turkey", *World Nuclear Association*, (up. 2023), accessed: August 30, 2023, [Nuclear Power in Turkey | Nuclear Energy In Turkey - World Nuclear Association \(world-nuclear.org\)](https://www.world-nuclear.org/information-library/nuclear-fuel-cycle/nuclear-power-in-turkey.aspx)

Particularly, Rosatom would fund the project and start with 100% equity. In the long-term, the Russian company intended to retain a large amount. In July 2010, the Turkish Parliament ratified the treaty. Even though a lot of efforts were taken, the project came to a stalemate. The primary reason was that the Turkish authorities did not give the appropriate licence to the Russian side⁷².

Another important and puzzling development was the energy politics regarding the region between Russia and Italy- Central Europe. There were two contrary and competitive to each other plans for constructing a network of natural gas pipelines. The first project named South Stream consisted of a pipeline starting from Russia, crossing the Black Sea and reaching Bulgaria. From there, through a network of pipelines, the natural gas would reach Italy and Austria. It was a proposal and initiative of Eni and Gazprom and a joint venture company named South Stream AG was established in January 2008 to operate the project. In the same month, Russia and Bulgaria signed an agreement for the construction and operation of the pipeline in Bulgarian soil. Russia and Serbia signed a relevant agreement as well. In February 2008, Hungary signed the agreement for South Stream. The aim of this pipelines system was to carry 63 bcm/year of Russian gas to Europe in an effort from Moscow to maintain its domination in the energy supply of Europeans and counterbalance the competitive Nabucco project⁷³.

On the other side, the discussions for the progress of Nabucco pipeline were escalated. It was a project the European Union supported. The target was the diversification of gas imports not only from Russia but also from other suppliers. Something like that was possible as the pipeline would be a new gas supply corridor and would offer transparency in the European single market and would increase the competitiveness⁷⁴. The pipeline was programmed to start from the Azeri Caspian Sea fields and to cross Anatolia and Eastern Thrace in Turkey. From that point, it would cross Bulgaria, Romania, Hungary reaching Austria. Throughout minor networks, it would terminate in Czech Republic and Germany. Its construction was to

⁷² "Nuclear Power in Turkey," *World Nuclear Association*.

⁷³ "South Stream Pipeline Project", *Hydrocarbons Technology*, accessed: September 01, 2023, [South Stream Pipeline Project, Europe - Hydrocarbons Technology \(hydrocarbons-technology.com\)](https://www.hydrocarbons-technology.com/projects/south-stream-pipeline-project-europe/).

⁷⁴ Yildiz, " Turkey's energy economy and future energy vision", 17-18.

begin in 2012, with a date of completion the year 2015. It could transport 31bcm/year of natural gas with a cost of 7,9 billion Euros⁷⁵.

It can be concluded that the competition between South Stream and Nabucco aroused the interest of Türkiye. Especially, the Nabucco project could offer the opportunity to become an energy hub, raise money from the taxes up to 450 million euros/ year and reaffirm its importance for the West. In general, this project would upgrade the status of the country regionally. In this context, it is not weird that Erdogan's government hosted the event of the sign of the Nabucco Intergovernmental Treaty. So, on 13 July 2009, in Ankara, the Nabucco transit countries' leaders from Türkiye, Austria, Bulgaria, Hungary and Romania were met. They were accompanied by the Iraqi prime minister Nuri al- Maliki, the Georgian president Mikhail Saakashvili, the EU's Commissioner Jose Manuel Baroso, the EU Energy Commissioner Andris Piebalgs and the US Special Envoy for Eurasian Energy Richard Morningstar. Although this ceremony was in favour of the Turkish side, Recep Erdogan did not exclude Russia and Iran from joining the project! Also, Turkmenistan's president Gurbanguly Berdimuhamedov expressed his readiness to export gas through this pipeline. This stance was very tricky because of the presence of representatives from the West who were against Russia. However, the US hold a mediocre profile. The American side did not exclude a Russian participation, while it refused any participation of Iran⁷⁶.

It is obvious that during the second term, Turkey moved further towards the energy transition, giving basis to the progress of the nuclear program. It is true that serious work was done. At the same time, Erdogan's government was loyal to the transformation of the country into an energy hub. However, the energy geopolitics did not turn in its favour. As the new elections of 2011 arriving, the Turkish government would be in front of several challenges, which would move the progress of energy transition.

⁷⁵ "Nabucco Gas Pipeline, Europe", *Hydrocarbons- Technology*, accessed: September 01, 2023, [Nabucco Gas Pipeline, Europe - Hydrocarbons Technology \(hydrocarbons-technology.com\)](https://hydrocarbons-technology.com/nabucco-gas-pipeline-europe/).

⁷⁶ Saban Kardas, "Nabucco Intergovernmental Agreement signed in Ankara", *The Jamestown Foundation*, last modified August 27, 2023, [Nabucco Intergovernmental Agreement Signed in Ankara - Jamestown](https://www.jamestown.org/program/nabucco-intergovernmental-agreement-signed-in-ankara/)

3.3 The third premiership of Recep T. Erdogan (2011-2014)

In July 2011 Recep Erdogan re-elected. The circumstances were critical. In the MENA region, some countries lived a revolution. The Arab Spring, as those revolutionary movements were called, started in December 2010 and culminated in the spring-summer of 2011. The Syrian revolution resulted in a terrible civil war. All those events took place in the neighbourhood of Türkiye. Furthermore, international tension between Russia and the West started to rise, especially from the summer of 2012 onwards. Concerning the Turkish state, it seemed that the situation was far better than the previous years and the re-election for a third time gave Recep Erdogan the chance to implement the policies he wanted. One of them was that of energy transition.

On 30 March 2013, the *Electricity Market Law* (Law 6446) was passed by the parliament. This law aimed at ensuring the establishment of a financially sound, stable, and transparent electricity market operating in a competitive environment. What is more, as a target was considered the establishment of an independent regulation and supervision of the private market for offering a good quality, low cost, without limitations and environmentally friendly electric energy to the Turkish consumers. This law regulates all the electricity sector, namely transmission, generation, distribution, wholesale, market operation, imports and exports as well as the rights and obligations of all real or legal persons engaged in this sector. In addition, there was a mention to the RE for the promotion of hydroelectric power plants. TEIAS took the responsibility for securing the transmission network. For the trade of electric energy was defined that TETAS would execute the energy purchase and sales agreements. There were provisions for the trade, the imports, and exports of electricity from the companies under a licence. For attracting private investors, this law granted tax exemptions for energy equipment, gave financial incentives (deductions) for infrastructure, and private and public companies would manage wholesale and retail sale activities⁷⁷.

⁷⁷ "6446 Electricity Market Law (2013), " *Laws Turkey*, accessed: August 02, 2023, [6446 Electricity Market Law \(lawsturkey.com\)](https://www.lawsturkey.com) and "Turkey: Electricity Market Law No. 6446 of 2013", *Asia Pacific Energy*, accessed: September 03, 2023, [Electricity Market Law No. 6446 of 2013 | ESCAP Policy Documents Managment \(asiapacificenergy.org\)](https://www.asiapacificenergy.org).

In the sector of RE, a serious progress was made. The government with the strategic plan for the period 2010-2014 aimed at increasing at least 30% the share of RE in the energy mix by 2023. Notably, it wanted to generate 10.000 MW of installed capacity of wind power, 300 MWe of geothermal energy and 500 MW capacity of hydroelectric energy.

In 2014, the National RE Action Plan was implemented, setting the targets for RE through 2023. Particularly, it promoted a capacity of 35 GW of hydroelectric energy, 20 GW of wind power, 5 KW of solar energy, 1 GW of geothermal energy and 2 GW of biomass.

In the infrastructure context, more wind plants than the previous years were commissioned or began to be constructed. In 2013, the Canta onshore wind farm was commissioned in the region of Istanbul. It consists of 21 turbines which can provide a capacity of 47,5 MW. It is owned by Boydak Enerji Uretim. The turbines generate 185.000 MWh of electricity, preventing the emission of 92.000 tons of CO₂⁷⁸.

In 2012 Balikesir onshore Wind Farm was commissioned. It is located in the homonymous region. It is owned by Enerjisa Enerji Uretim. It generates 549.000 MWh of electricity, and it costed 253 million dollars. It has 52 turbines. In the same year, Dagpazari Wind Plant was constructed in Mersin. It has 13 turbines. This space is the ownership of Enerjisa Enerji Uretim. The project generates 129.000 MWh of electricity offsetting 70.000 tons of CO₂/year.

Geycek onshore wind park, located in Kirsehir, was another one 150 MW RE project got commissioned in May 2014. The company Polat Enerji Sanayi ve Ticaret exploits this project. It generates 384.000 MWh of electricity, offsetting 245.000 tons of CO₂ emissions/year. It costed 285 million dollars, and it has over 40 turbines⁷⁹. In September

⁷⁸ "Canta, Turkey", *The Wind Power*, last modified December 01, 2022, [Canta \(Turkey\) - Wind farms - Online access - The Wind Power](#) and "Power plant profile: Canta Wind Farm, Turkey", *Power- Technology*, last modified July 31, 2023, [Power plant profile: Canta Wind Farm, Turkey \(power-technology.com\)](#).

⁷⁹ "Geycek (Turkey)", *The Wind Power*, accessed: September 05, 2023, [Geycek \(Turkey\) - Wind farms - Online access - The Wind Power](#) and "Power plant profile: Canta Wind Farm, Turkey", *Power- Technology*, last modified December 08, 2021, [Geycek, Turkey \(power-technology.com\)](#).

2014, the onshore Kangal Wind Farm was completed. Its location is in Sivas and it generates 174.500 MWh of electricity using over 50 turbines. It costed 233 million dollars⁸⁰.

Another notable achievement was the commission of the Greenway Solar Tower in Mersin with a nominal capacity of 1,4 MW. Also, the Gumuskoy Geothermal Power Plant is an indication of the willingness of Türkiye to invest in the exploitation of geothermal energy. It was commissioned in 2013. Its capacity is 13,2 MW. It is located in Aydin province⁸¹. In hydroelectricity, the Erdogan's government showed interest as well. In 2012, the Boybat Dam was commissioned. The dam is located in the Lower Kizilirmak basin near Sinop. It can generate 1.500 GWh of energy annually⁸². The Deriner Dam is another such structure. It was built on the Coruh river near Artvin in north-eastern Turkey. It started its function in the period 2012-2013. It has an annual capacity of 2.118 GWh, which shares the 1,1% of total energy production and 6% of total national capacity of hydroelectricity. Also, it offers other services such as flood control and fishing opportunities. The dam is owned and operated by the State Hydraulic Works⁸³. In the same period, Köprü Dam was inaugurated. It is located in Adana, on the Seyhan river. It generates per year a capacity of electricity of 383,9 GWh⁸⁴.

During the years 2011-2014, the Turkish government continued the efforts to acquire nuclear power. The IAEA conducted research on the country and its conclusion was positive for the Turkish side. At parallel, the government and the special agencies gave construction licences to Rosatom for the station in Akkuyu⁸⁵.

⁸⁰ "Kangal RES (Turkey)", *The Wind Power*, accessed: September 20, 2023, [Kangal RES \(Turkey\) - Wind farms - Online access - The Wind Power](#) and "Kangal RES (Turkey)", *Power- Technology*, last modified December 9, 2021, [Kangal RES, Turkey \(power-technology.com\)](#)

⁸¹ Oliver Padraig, Martin Stadelmann, "Public finance and private exploration in geothermal: Gümüşköy Case Study, Turkey", *Climate Policy Initiative*, March 02, 2015, [Public Finance and Private Exploration in Geothermal: Gümüşköy Case Study, Turkey - CPI \(climatepolicyinitiative.org\)](#).

⁸² "Boybat Dam & HEPP", *Su Yapi*, accessed: August 31, 2023, [Boyabat Dam & HEPP - Hydroelectric Power Plants - SU-YAPI Engineering & Consulting Inc. \(suyapi.com.tr\)](#).

⁸³ "Deriner dam and hydroelectric power plant (HEPP) Project, Project Çoruh river", accessed: August 30, 2023, [Deriner Dam and Hydroelectric Power Plant \(HEPP\) Project, Çoruh River - Renewable Technology \(renewable-technology.com\)](#).

⁸⁴ "Köprü HEPP", *Enerjisa Üretim*, accessed: September 10, 2023, [Köprü Hydroelectric Power Plants & HEPP | Enerjisa Üretim \(enerjisauretim.com.tr\)](#).

⁸⁵ "Nuclear power in Turkey", *World Nuclear Association*.

In the field of energy diplomacy and geopolitics, there were remarkable developments. To begin with, in June 2012, the agreements for the construction of Trans- Anatolian Pipeline (TANAP) between Turkey and Azerbaijan were signed. In 2013-2014, the principal agreements came into legal force and the works could start. This pipeline would start from the Turkish-Georgian border and complete its journey in Ipsala next to the Greek-Turkish borders. It has a length of 1.811 km. The aim of this project was to bypass the Russian supply lines of Europe via the Southern Gas Corridor. As a result, it would enhance the energy security of Türkiye and Europe and would bring them in touch with Azerbaijan⁸⁶. From Ipsala, it was about to be connected with the TAP project, transporting natural gas from the Caspian Sea to Italy. In summer 2013, the Nabucco project was cancelled. Although there was a serious interest from many states, the strong position of Gazprom and, generally, Russia in the energy market led to this outcome. For the EU, Russia was a reliable supplier, while the Barack Obama’s administration did not interest in the project firmly.



Figure 8 A map depicting the pipeline network of Southern Gas Corridor. This network extends from Shah Deniz field to Italy. It crosses Türkiye as well (Source: The Ministry of Energy of the Republic of Azerbaijan).

⁸⁶ "TANAP", TANAP, accessed: September 20, 2023, [TANAP - The Trans Anatolian Natural Gas Pipeline Project](#).

Consequently, the TAP was preferred to carry the Azeri gas to Italy and Greece. The lack of a common European energy policy was proved with this failure⁸⁷. The same fate had the South Stream pipeline project in 2014 as well. The main reasons were the Russian illegal annexation of Crimea and the beginning of warfare in eastern Ukraine, as well as the implementation of other projects such as TANAP and TAP. Speaking of these terms, it was impossible for the EU to accept this project taking into consideration the Third Energy Package, which Gazprom seemed to violate⁸⁸.

In a nutshell, the period 2011-2014 was very productive. There was a substantial progress on the Turkish nuclear program. Also, the energy diplomacy was intensive, some changes in relations to the previous years occurred but they did not negatively affect the country. In the legal context, the legislation permitted the further liberalization of energy market. Lastly, this period marked the beginning of construction of many RE plants pushing the efforts for energy transition a step beyond.

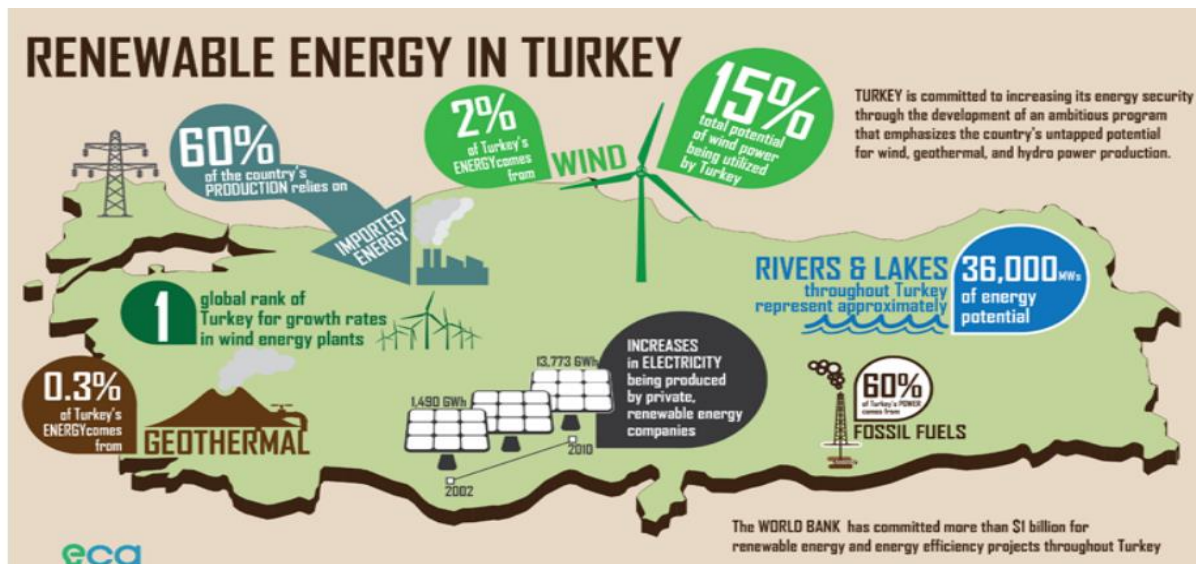


Figure 9: Map depicting the renewable energy mix and its potential in 2013, (Source: World Bank)

⁸⁷ Leslie Palti- Guzman, "Don't cry for the Nabucco pipeline", *Reuters*, May 01, 2014, [Don't cry for the Nabucco pipeline | Reuters](#).

⁸⁸ Richard Morningstar, "The demise of South Stream", *Atlantic Council*, last modified December 4, 2014, [The Demise of South Stream - Atlantic Council](#). Also, H el ene Richard, "Why Russia cancelled South Stream", *Le Monde Diplomatique*, last modified June 2015, [Why Russia cancelled South Stream, by H el ene Richard \(Le Monde diplomatique - English edition, June 2015\)](#).

3.4 The first presidency of Recep T. Erdogan (2014-2018)

In August 2014, the Turkish presidential elections took place. The AKP announced that its candidate would be Recep Erdogan. In his position, Ahmet Davutoglu was chosen as a prime minister. This change had not any negative effects on the policy of energy transition.

Firstly, in the RE sector, there was further progress. In January 2015, there were 182 licenced projects with a total capacity of wind energy of 6,103 MW⁸⁹. In June 2015, the Mut Wind Farm in Mersin was completed, and it has 16 wind turbines. It is owned by Borusan Enerji Yatirimlari ve Uretim. The plant generates 153 GWh of electricity, reducing the CO2 emissions by 85.000 tons⁹⁰. As concern as the hydropower, in January 2015 Turkey reached the capacity of 23,643 MW. However, some problems were emerged, such as environmental and construction issues and a length administrative process⁹¹.

At the end of 2014, 58 plants of energy production from biomass were in operation with a total capacity of 289 MW⁹². This was a sign of progress not only on the RE but also on this category of energy generation. In the same period, the country reached 40,2 MW of capacity of solar energy. This capacity was a clear sign that Türkiye in solar energy laid behind even though it is a very sunny country.

⁸⁹ "Turkey's energy transitions: milestones and challenges", 112.

⁹⁰ "Power plant profile: Mut Wind Farm, Turkey", *Power- Technology*, last modified July 31, 2023, [Power plant profile: Mut Wind Farm, Turkey \(power-technology.com\)](#) and "Mut (Turkey)", *The Wind Power*, last modified December 01, 2022, [Mut \(Turkey\) - Wind farms - Online access - The Wind Power](#).

⁹¹ "Turkey's energy transitions: milestones and challenges", 41.

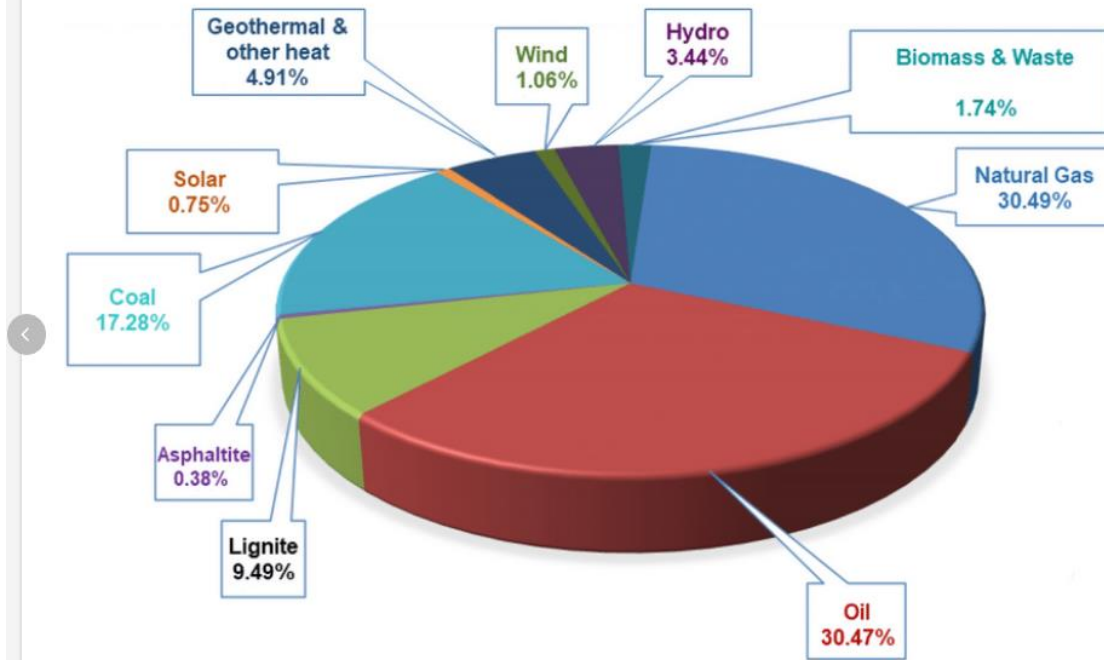
⁹² "Turkey's energy transitions: milestones and challenges", 115.

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Turkey's primary energy consumption by sources (2018) (The graph is modified using TMMOB 2019 Report)

Figure 10: A pie presenting the energy mix in 2018. The majority of energy production comes from oil and natural gas. Also, the share of RE is increased. Coal holds an important position as well, (Source: *Clean Technologies and Environmental Policy*).

As the climate change was getting more serious, the UN took the initiative. From 30 November to 12 December 2015, the United Nations Climate Change Conference was held in Paris, France. It was a collective effort to protect the environment after the failure of Kyoto Protocol. This agreement was to be binding. An amount of 196 countries participated and agreed by consensus to the final international pact, the Paris Agreement. The principal aim of the agreement was to have a stronger response to the danger of climate change and to enhance the implementation of the UN Framework on Climate with a series of measures. First things first, through holding the increase in the global average temperature below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1,5 °C above pre-industrial levels recognizing that this would significantly reduce the risks and impacts of climate change. Moreover, there was the provision that by increasing the ability to

adopt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development in a manner that does not threaten food production. Lastly, by making finance flows consistent with a pathway towards low greenhouse gas emissions and climate resilient development⁹³.

Türkiye took part in the conference. It is worth mentioning that H.E. Fatma Guldemet Sari, the minister of Environment and Urbanization talked in front of an audience on 7 December. She recognized that the climate change is present; it is urgent to be tackled and its consequences affect people and countries beyond borders. He called for a realistic and a flexible system of solutions. She mentioned the rapid development of Türkiye and referred the financial issues emerge to the reduce the gas emissions. She also made clear the willingness of the Turkish government to join this conference as a ‘‘developing country’’. In the end, she informed the other participants that her country has a target to reduce greenhouse emissions and combat climate change for 2030. Furthermore, she talked about the green national strategy on progress for 2050⁹⁴.

Nevertheless, Davutoglu’s government and Recep Erdogan did not ratify the Paris Agreement. Türkiye signed the agreement – the period of signature was from 22 April 2016 to 21 April 2017 at the UN headquarters in New York. The main reason behind this refusal was the characterization of the country as a developed rather than as a developing. Which was the problem? The answer is that as a developed and one of the world’s industrialized countries, Türkiye should put a larger amount of effort for tackling with the climate change and aid economically other developing states to reduce their emissions. So, the governments of the developing states would have more time to reduce the emissions and the responsibilities would be fewer than other developed states such as China or the USA⁹⁵. Another event which may discouraged the ratification was the withdrawal of the USA. On 4 August 2017, the American president Donald Trump officially declared that his country was not bound by the Agreement. Recep Erdogan, speaking at the G20 Summit in Germany, in

⁹³ United Nations Framework Convention on Climate Change, ‘‘Adoption of the Paris Agreement’’, published December 12, 2015, [l09r01.pdf \(unfccc.int\)](#).

⁹⁴ H.E. Fatma Guldemet Sari, Speech in the 21th session of the Conference of Parties, (2015), accessed: September 03, 2023, [cop21cmp11_hls_speech_turkey.pdf \(unfccc.int\)](#).

⁹⁵ Malak Altaeb, ‘‘Turkey finally ratified the Paris Agreement. Why now?’’, *Middle East Institute*, last modified October 27, 2021, [Turkey finally ratified the Paris Agreement. Why now? | Middle East Institute \(mei.edu\)](#).

July 2017, announced that after the above withdrawal, the position of his country was difficult. Such a development could eliminate the compensations Türkiye could claim as a developing country. So, the risk of the ratification was too high to be taken⁹⁶. A comment on this occasion is necessary. The reasoning of the Turkish president was puzzled. Türkiye, as it was mentioned above, had been characterized as a developed nation, not a developing one. How it could be characterized as a developing nation it is a good question.

In 2017, the *National Energy Efficiency Action Plan (2017-2023)* came into force. It included many actions in the sectors of agriculture, energy transport and building constructions. It promoted the resources efficiency. It regarded dimensions such as the environment and the economy. It prioritized the reduction of harmful energy emissions and the efficiency of the electricity grid and the prevention of a loss of energy. As concern as the industrial sector, it promoted the investments to improve energy efficiency for reducing emissions not less than 10%. Also, as a target was set, the harmonization of the labelling and production with the relevant EU Directives. A provision is taken for the building sector, such as the construction of buildings for being environmentally friendly. The way to achieve that was the publication of energy certificates and the transformation of 1/4 of building stock into environmentally sustainable until 2023. In addition, it presented a framework of actions for the transportation in order to retain an environmentally friendly role. Particularly, the goals it set were tax reductions for environmentally harmless vehicles, the increase in the use of alternative fuels vehicles, the development of the bicycle and pedestrian transportation, the reduction of traffic jam with smart measures, the utility of public transport means using fuels like hydrogen or electricity and the strengthening of maritime and rail transport. This action plan covered the agricultural sector as well. The substitution of the existing tractors with energy- efficient ones, the energy-efficiency irrigation methods, the utility of RE resources and the use of biomass as a by-product and waste of agriculture activities were some goals for achieving. Last but not least, an important provision was the creation of a special mechanism which could give financial support in implementing energy efficiency measures.

⁹⁶ Reuters Staff, "Erdogan says U.S. stance stalls Turkish ratification of Paris Climate deal", *Reuters*, last modified July 08, 2017, [Erdogan says U.S. stance stalls Turkish ratification of Paris climate deal | Reuters](#).

It would be possible for other funds to join this mechanism and the channelling of this money would be a subject of monitoring by a controlling organization.⁹⁷

The same year, another improvement was made. The first lady of the country, Emine Erdogan, announced the *Zero Waste Project* in collaboration with the Ministry of Environment and Urbanization. The aim was to stop the waste to end in landfills and increase public awareness about waste management. It was compulsory for all the municipalities. The results were optimistic. The recycling rates increased to 15% in 2018, while there is a target to expand this rate to 35% by 2023. Türkiye was affected by the adoption in 2015 of the EU Action for CE. This action included policies for consumption and waste management and the establishment of a legislative proposal⁹⁸.

⁹⁷ "Turkey: National Efficiency Action Plan (NEEAP) 2017-2023", *Policy- Asia Pacific Energy*, accessed: September 12, 2023, [National Energy Efficiency Action Plan \(NEEAP\) 2017-2023 | ESCAP Policy Documents Managment \(asiapacificenergy.org\)](https://asiapacificenergy.org) and [National Energy Efficiency Action Plan \(NEEAP\) 2017-2023 \(EN\).pdf \(asiapacificenergy.org\)](https://asiapacificenergy.org).

⁹⁸ Selma Erat, Azime Telli, " Within the global circular economy: a special case of Turkey towards energy transition", *MRS Energy & Sustainability* 7, no.28 (2020), 5 doi:10.1557/mre.2020.26.



Figure 21: The e-jest bus. The electric urban vehicle manufactured in Türkiye by Karsan, (Source: Clean Technica)

The energy diplomacy, again, appeared on the horizon. The failures of Nabucco and South Stream pipeline projects had alerted the Turkish government. Though, the Russo-Turkish energy cooperation was proved strong enough. In December 2014, the Russian president Vladimir Putin informed the audience during a state visit in Türkiye for the construction of a new natural gas pipeline, named Turkstream. The relevant Memorandum of Understanding was signed by Gazprom and BOTAŞ. This project was going to benefit Türkiye due to its direct supply of 31,5 bcm/year of gas in the Turkish market. As well as, because it set the base for the creation of new job positions, new investment opportunities and upgrading the national industry.

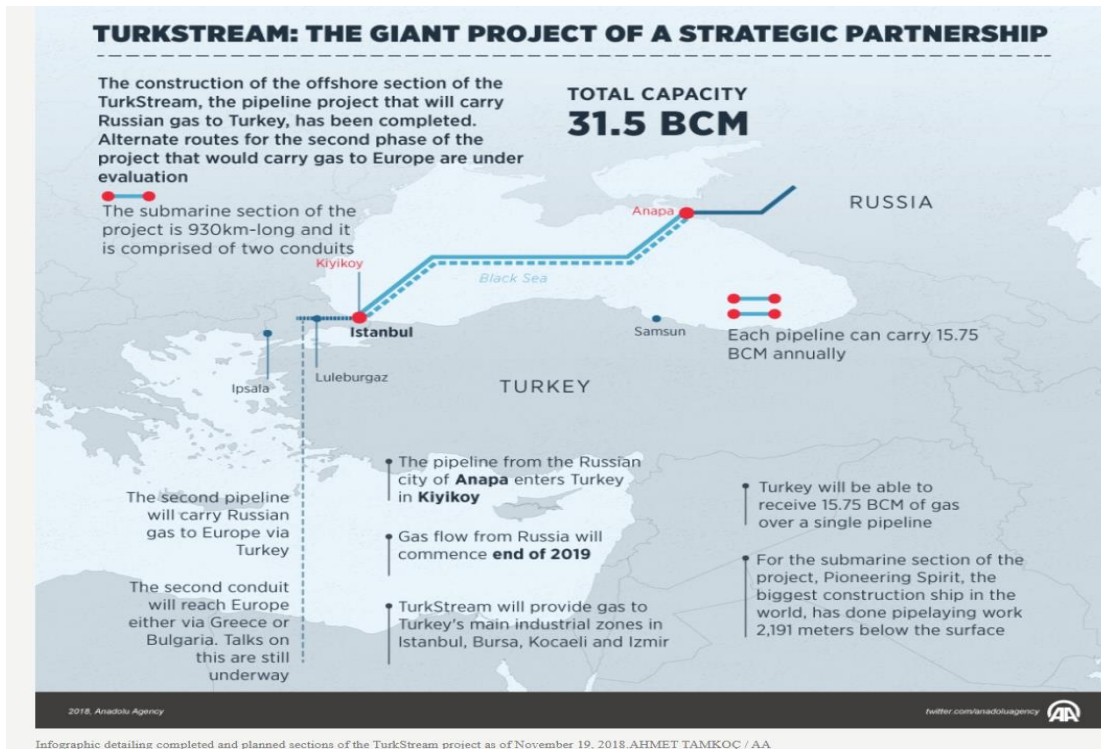


Figure 13: The Turkstream pipeline is one of the most important energy projects in eastern Europe, (Source: Anadolu Agency)

Although the odds were positive, in November 2015, the Turkish Air Force shot down a Russian jet over the Turkish airspace. This event infuriated Moscow. The latter accused Türkiye for this incident, but also for importing oil illegally from ISIS. In addition, the Russian government took restrictive measures such as the halt of the construction of the pipeline and the prevention of Russian tourists from visiting the country⁹⁹. In the end, both parties overcame the bilateral crisis in late 2016. In that period, the intergovernmental agreement was signed, and the construction works started in May 2017.

In March 2015, the Turkish parliament ratified the official prime ministerial agreement of 2013 regarding the construction of a nuclear facility in Sinop. From the company which was going to manage the plant, EUAS would take 35% and the rest would be short among Mitsubishi, Itochu and Engie. However, Itochu and Engie in April 2018 were pulled out of the project because of disagreements related to the status, namely the facility would be completed under BOO or BOT model. So, the target to be ready in 2023 failed.

⁹⁹ Georgi Gotev, "Erdogan fumes at Russian restrictive measures", *EURACTIV*, last modified November 27, 2015, [Erdogan fumes at Russia's 'restrictive measures' after jet downing – EURACTIV.com](http://www.euractiv.com).

In 2017, the construction licences for the Akkuyu nuclear facility were given. The Turkish government took another brave step towards the development of a nuclear program. Concerning the other nuclear plant in Thrace, in November 2014, EUAS and State Nuclear Technology Corporation of China and Westinghouse signed an agreement for the development of the project. In October 2015, there was a confirmation that the new nuclear site would be in eastern Thrace¹⁰⁰. Those movements proved that independently of the prime minister, the nuclear ambition of the country remained stable.

During the premiership of Ahmet Davutoglu, the policy of energy transition was continued without burdens. Action plans for the transition to the utility of environmentally friendly energy were designed and put into force. Regarding the nuclear program, a progress was obvious with the exception of the Sinop project. Moreover, the Turkish government managed to succeed and fail in the energy diplomacy. The Turkstream pipeline offered the chance to increase the routes of natural gas to the Turkish market. At parallel, it enhanced the status of the country as an energy hub. Also, it took part in the great international event in Paris for the climate change. However, it failed to be considered as a developing country and its attitude towards the Paris Agreement was not so positive.

3.5 The second presidency of Recep T. Erdogan (2018-)

In 2016-2017, the AKP started the process of the constitutional revision, through a referendum. The modifications were many. One of the most notable concerned the political regime. Particularly, the willingness of the AKP was to change the status of the political system from a premiership to presidency. On 16 April 2017, the referendum made clear that Türkiye from now on will have a president. In April 2018, the first presidential elections of the country took place. Recep T. Erdogan was elected as the first president of Türkiye. This development, except it brought the Turkish politician in front of the political scenery one more time, it signalled a small shift in national energy policy and especially in energy diplomacy and geopolitics.

¹⁰⁰ "Nuclear power in Turkey", *World Nuclear Association*.

Some months before, the Eni's drillship was chased violently by Turkish ships from an energy field off Cyprus. It was the first sign of this new policy. From now on, Türkiye would start its own oil and gas research in the Aegean Sea and eastern Mediterranean. Also, it would act out of the international law in case it was imposed by its national interests.

Rapidly, in late October 2018, the first drillship of TPAO named "Fatih" was set sail. This development marked the initiation of the first deep-sea drilling operation at the deep-water well of Alanya-1 off the shores of Antalya. The operation would be supported by US and Norwegian companies¹⁰¹. What is more, TPAO acquired another drillship, named "Yavuz" in the same period.

At parallel, the seismic vessel "Hayreddin Barbaros Pasha" during research operations in the eastern Mediterranean was harassed by a frigate of the Hellenic Navy. So, for protection, the Turkish government sent naval units for patrolling and overseeing the ship. Erdogan explained that it was going to support the national interests¹⁰².

In 2019, again, the drill ships, "Fatih" and "Yavuz" were sent west off the island of Cyprus¹⁰³. In August 2019, the other domestic shipbuilding seismic vessel "Oruc Reis" set sail from Istanbul to the eastern Mediterranean, northern of Cyprus. So, with this movement, Türkiye escalated the tension in the region. This escalation was caused by the presence of four vessels in the summer of 2019, "Fatih", "Yavuz", "Oruc Reis" and "Hayreddin Barbaros Pasha", each of them conducting research¹⁰⁴!

The next year, the Turkish policy did not change. "Oruc Reis" set sail with a destination the eastern Mediterranean in order to conduct hydrocarbon research off the Cypriot coast. It was declarative of the Turkish attitude the fact that the minister of energy & natural resources,

¹⁰¹ "Turkey's first drilling vessel Fatih to launch deep-sea operation in the Mediterranean this week", *Daily Sabah*, (2018), October 30, 2018, [Turkey's first drilling vessel Fatih to launch deep-sea operation in Mediterranean this week | Daily Sabah](#).

¹⁰² "Turkey sends frigate to East Med to protect seismic vessel Barbaros Hayreddin Pasha", *Daily Sabah*, last modified October 24, 2018, [Turkey sends frigate to East Med to protect seismic vessel Barbaros Hayreddin Paşa | Daily Sabah](#).

¹⁰³ Elif Erşen, "Turkey deploys second drilling vessel off Cyprus island to search for gas, oil", *Daily Sabah*, June 21, 2019, [Turkey deploys second drilling vessel off Cyprus island to search for gas, oil | Daily Sabah](#).

¹⁰⁴ "Seismic exploration vessel Oruc Reis sets sail for Eastern Mediterranean", *Daily Sabah*, last modified August 31, 2019, [Seismic exploration vessel Oruc Reis sets sail for Eastern Mediterranean | Daily Sabah](#).

Fatih Donmaz, stated that his country has interests in the area¹⁰⁵. However, in front of the EU summit in October, Türkiye withdrew the ship. It sent it back until 29 November after the conclusion that the result of the summit was not satisfactory¹⁰⁶. At the same level, the other vessel “Hayreddin Barbaros Pasha” was announced that it would conduct research between 10 October and 9 November¹⁰⁷.

At parallel, from 2 October, “Yavuz” which was off Cyprus abandoned the region¹⁰⁸. Together, the drillship “Kanuni” sailed from Kastellorizo to Istanbul. Its passage caused a small- scale tension between Greece and Türkiye. The situation was exacerbated with the presence of “Oruc Reis” on the Greek continental shelf¹⁰⁹.

The willingness of Recep Erdogan for drilling operations was fruitful somewhere else, in the Black Sea. The research operations led to the discovery of some very prominent natural gas fields. “Fatih” began the first drill in the Turkali-1 well in the Sakarya gas field. In August, the Turkish president announced that his country made the biggest gas discovery¹¹⁰.

In summer 2022, Türkiye presented a new purchase. The new drillship named “Abdullhamid Han”. The drill target would be the Yorukler-1 well about 55 km off the coast of Gazipasa in Antalya province. The other relevant ships were in the Black Sea. This movement caused reactions from Greece and Cyprus¹¹¹.

Furthermore, in September 2022, the Turkish ministry of energy announced that “Oruc Reis” would be ready for action in one month. Although it did not locate the operations

¹⁰⁵ Ebru Sengul Cevrioglu, “Turkey’s Oruc Reis vessel on duty in E. Med.”, *Anadolu Agency*, last modified August 10, 2020, [Turkey's Oruc Reis vessel on new duty in E.Med.: Min. \(aa.com.tr\)](https://www.aa.com.tr/en/news/2020/08/10/turkey-s-oruc-reis-vessel-on-duty-in-e-med/).

¹⁰⁶ “East Med: Turkish research ship back in port ahead of EU Summit”, *Al-Jazeera*, last modified November 30, 2020, [East Med: Turkish research ship back in port ahead of EU summit | News | Al Jazeera](https://www.aljazeera.com/news/2020/11/30/east-med-turkish-research-ship-back-in-port-ahead-of-eu-summit/).

¹⁰⁷ Murat Temizer, “Turkey’s Barbaros Hayreddin Pasa vessel to stay in E. Med. until Nov 9”, *Anadolu Agency*, last modified October 09, 2020, [Turkey's Barbaros Hayreddin Pasa vessel to stay in E.Med until Nov 9 \(aa.com.tr\)](https://www.aa.com.tr/en/news/2020/10/09/turkey-s-barbaros-hayreddin-pasa-vessel-to-stay-in-e-med-until-nov-9/).

¹⁰⁸ “Turkey’s Yavuz leaves Cyprus EEZ”, *E-Kathimerini*, last modified October 05, 2020, [Turkey's Yavuz leaves Cyprus' EEZ | eKathimerini.com](https://www.e-kathimerini.com/en/2020/10/05/turkey-s-yavuz-leaves-cyprus-eez/).

¹⁰⁹ “Turkish drill ship south of Kastellorizo as Athens says 6 nautical miles a red line”, *E- Kathimerini*, last modified October 15, 2020, [Turkish drill ship south of Kastellorizo as Athens says 6 nautical miles a ‘red line’ | eKathimerini.com](https://www.e-kathimerini.com/en/2020/10/15/turkish-drill-ship-south-of-kastellorizo-as-athens-says-6-nautical-miles-a-red-line/).

¹¹⁰ Gokce Topbas, “Fatih drillship in Turkali-1 well”, *Anadolu Agency*, last modified November 05, 2020, [Fatih drillship starts drilling in Turkali-1 well \(aa.com.tr\)](https://www.aa.com.tr/en/news/2020/11/05/fatih-drillship-starts-drilling-in-turkali-1-well/).

¹¹¹ “Turkey sends new drill ship to eastern Mediterranean”, *Deutsche Welle*, September 08, 2022 [Turkey sends new drill ship to eastern Mediterranean – DW – 08/09/2022](https://www.dw.com/en/turkey-sends-new-drill-ship-to-eastern-mediterranean/a-61444444).

region, it is possible that this region would be the eastern Mediterranean, a place in which it operated the previous years¹¹².

In this context, a notable achievement should be noticed. This achievement concerns the progress of research in the Black Sea. The Turkish missions discovered from 2020 to 2022 three deposits, Sakarya, Sakarya North and Caycuma. This situation created opportunities for further exploitation. Particularly, allows the construction of infrastructure so as to natural gas be transferred from the well to the Turkish market. The sale operator will be TPAO. Though, the difficulty of the construction led the Turkish government in October 2021 to award to two foreign companies an engineering procurement, construction and installation contract. Except this, a natural gas processing plant was decided to be completed, which is going to purify this resource. It is located in the port of Filyos, 155 km south of Sakarya well in Zonguldak province. The connection and flow of the raw material from the well to the plant will be possible with a pipeline. It has been calculated and a second phase from a deposit with another pipeline. The result will be for the first phase, an estimated 150 cmb from 2023 to 2050. During the second phase, this quantity skyrockets to almost 600 bcm from 2027 to 2050. The Filyos plant is expected to be commissioned in 2023. There was a delay due to the deadly earthquake that hit Türkiye in February 2023.

¹¹² "Turkey ready to deploy Oruc Reis in a month, says energy minister", *E-Kathimerini*, September 20, 2022, [Turkey ready to deploy Oruc Reis in a month, says energy minister | eKathimerini.com](https://www.kathimerini.com/energy/turkey-ready-to-deploy-oruc-reis-in-a-month-says-energy-minister/).

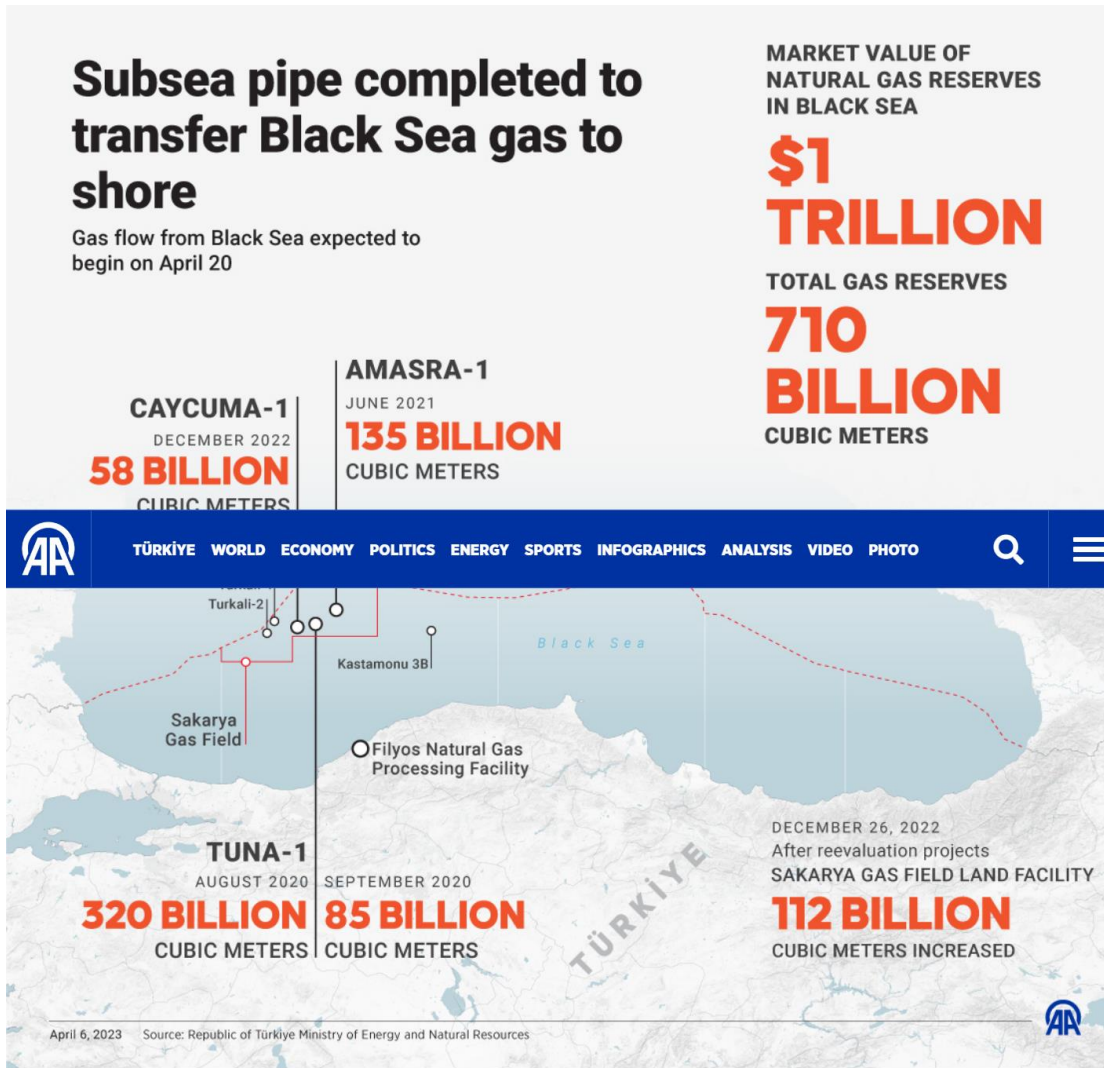


Figure 14: A map showing the gas fields and the processing facilities in the Black Sea region, (Source: Anadolu Agency)

In the RE sector, there was slow progress. In 2019, the Tatlipinar Wind Farm was commissioned. It has 20 turbines, and it is located in Balıkesir. It is owned by Tatlipinar Enerji Üretim. It is expected to supply with clean energy 50.000 households¹¹³. The Saros Wind Farm in Canakkale was entered into function in 2022. Its construction began in 2020 by Boylan Enerji Yarıtlım ve Tic and it is owned by Borusan En BW Enerji. It generates

¹¹³ "Tatlipinar RES (Turkey)", *The Wind Power*, last modified December 01, 2022, [Tatlipinar RES \(Turkey\) - Wind farms - Online access - The Wind Power](#) and "Power plant profile:Tatlipinar RES, Turkey", *Power-Technology*, (2023), last modified August 03, 2023, [Power plant profile: Tatlipinar RES, Turkey \(power-technology.com\)](#).

530.000 MWh electricity and provides clean energy to 190.000 households¹¹⁴. Nowadays, it is under construction one more wind power plant in Balıkesir, the Sah Wind Farm. It is developed and owned by Galata Wind Enerji. It has 6 turbines, and it is expected to be functional by 2025. It can generate 583.000 MWh, preventing 218.583 tons of CO₂ from releasing in the air¹¹⁵.

Additionally, in Istanbul in 2020, the first phase of a bio-gas plant was completed. It covers 20 hectares of land, and it produces 20 MW of energy. When it will be completed, it would cover 130 hectares and it would have a full capacity of 90 MW. It will be the biggest such facility in the world. The Seymen landfill gas power plant as it is named can supply 500.000 households in the city. It could save the emission of two million tons of CO₂/ year. However, it is not ready yet¹¹⁶. In the end, even though progress in the processing of biomass is perceived, the bio-energy is not widely utilized in the country.



Figure 15: The Seymen landfill gas power station. It may be the beginning of the utility of biomass, (Source: BMF Enerji)

¹¹⁴ "Power plant profile: Saros Wind Farm, Turkey", *Power- Technology*, last modified August 03, 2023, [Power plant profile: Saros Wind Farm, Turkey \(power-technology.com\)](https://www.power-technology.com/news/article/power-plant-profile-saros-wind-farm-turkey/). Additionally, "Saros (Turkey)", *The Wind Power*, accessed: September 19, 2023, [Saros \(Turkey\) - Wind farms - Online access - The Wind Power](https://www.thewindpower.net/news-item/saros-turkey-wind-farms-online-access-the-wind-power/).

¹¹⁵ "Power plant profile: Sah Wind Farm- extension, Turkey", *Power- Technology*, accessed: September 05, 2023, [Power plant profile: Sah Wind Farm-Extension, Turkey \(power-technology.com\)](https://www.power-technology.com/news/article/power-plant-profile-sah-wind-farm-extension-turkey/). Also, " SahRes (Turkey)", *The Wind Power*, last modified December 01, 2022, [SahRes \(Turkey\) - Wind farms - Online access - The Wind Power](https://www.thewindpower.net/news-item/sahres-turkey-wind-farms-online-access-the-wind-power/).

¹¹⁶ Igor Todorovic, "Istanbul completes first phase of world's biggest landfill gas power plant", *Balkan Green Energy News*, September 17, 2020, [Istanbul completes first phase of world's biggest landfill gas power plant \(balkangreenenergynews.com\)](https://www.balkangreenenergynews.com/news/istanbul-completes-first-phase-of-worlds-biggest-landfill-gas-power-plant/).

Regarding geothermal energy, from 1984 to 2020 there were 364 plants generating energy for heat and air-conditioning purposes. In 2020, Türkiye reached the production of 157 MWe in contrast to 2010, which the installed capacity was 94 MWe. By 2030, the target is a production greater than 3000 MWe electricity for being added in the national grid¹¹⁷.

Undoubtedly, a sign of progress was the increase of solar energy generation and particularly the utility of photovoltaics. The aim of this policy is to enhance the rooftop solar power production. This form of RE has some advantages. The savings on energy bills, a governmental financial aid and annual cost reductions. It is not weird that in May 2019, the government passed a new law giving incentives for rooftop solar panels. One of them is a monthly energy credit for households in case they export energy in the grid. Another is measures for benefiting the solar rooftops for individual consumers than the larger industrial installations. This law opened the road for the enlargement of the rooftop solar power in Türkiye.

Lastly, in the sector of nuclear energy, the progress was remarkable both in a legal and practical context. As concern as the legal framework, on July 02, 2018, the *Decree- Law on the Organization and Duties of the Nuclear Regulatory Authority* (No. 702) was published. This decree established the Nuclear Regulative Authority, a public legal company responsible for overseeing and managing the nuclear energy activities. Though, the Constitutional Court cancelled this decree in December 2020. The Turkish government covered the gap with the *Nuclear Regulation Law* (Law. 7381) on March 05, 2022. This new law aimed at setting out the principles to be applied for the protection of the environment and humans from harmful nuclear radiation. As well as it set out the responsibilities of the parties involved, the status of this agency on relevant activities and it attributed the legal responsibilities in case of a nuclear accident. In other words, it created a tied framework for

¹¹⁷ Dornadula Chandrasekharam, Alper Baba, "Carbon dioxide emissions mitigation strategy through enhanced geothermal systems: western Anatolia, Turkey", *Environmental Earth Sciences* 81, no. 35 (2022), [Carbon dioxide emissions mitigation strategy through enhanced geothermal systems: western Anatolia, Turkey | SpringerLink](#).

authorizations, inspections, financial and penal provisions with the NDK the protagonist for all the activities on the nuclear energy sector¹¹⁸.

In September 2022, the Russian and Turkish presidents agreed to resume the project in Akkuyu. As a result, the construction works started. The February 2023 earthquake hit as well as the construction site, but it did not cause any damage. In September 2020, the works for the other nuclear plant in Sinop resumed. Also, in late 2022, the Korean Electric Power Corporation proposed the installation of four reactors. The developments for the nuclear plant in eastern Thrace were in progress. In November 2022, there was an announcement that the Turkish government had started studies into the potential of this construction. In early summer 2023, it was reported that negotiations between Türkiye and Chinese companies for this construction had started in Kirklareli province¹¹⁹.



Figure 16: The digital model of Akkuyu nuclear plant (Source: Anadolu Agency)

¹¹⁸ Mustafa Gunes, "Sponsored briefing: new law on nuclear energy in Turkey", *Legal Business*, April 28, 2022, [Sponsored briefing: New law on nuclear energy in Turkey - Legal Business](#). Also, "About NDK", *Nuclear Regulatory Authority*, accessed: 05 September, 2023, [About NDK](#). Additionally, Ioannis Grigoriadis, Eliza Gheorghe, "The Akkuyu NPP and Russian- Turkish nuclear cooperation: Asymmetries and risk", *ELIAMEP*, no. 100, (2022), [The Akkuyu NPP and Russian-Turkish Nuclear Cooperation: Asymmetries and risks – Ioannis N. Grigoriadis and Eliza R. Gheorghe : ELIAMEP \(eliamep.gr\)](#). For this specific law, it was unable to find any information from the official site Laws Turkey. However, the above sources present a panorama of this law, capable of offering the appropriate information.

¹¹⁹ "Nuclear power in Turkey".

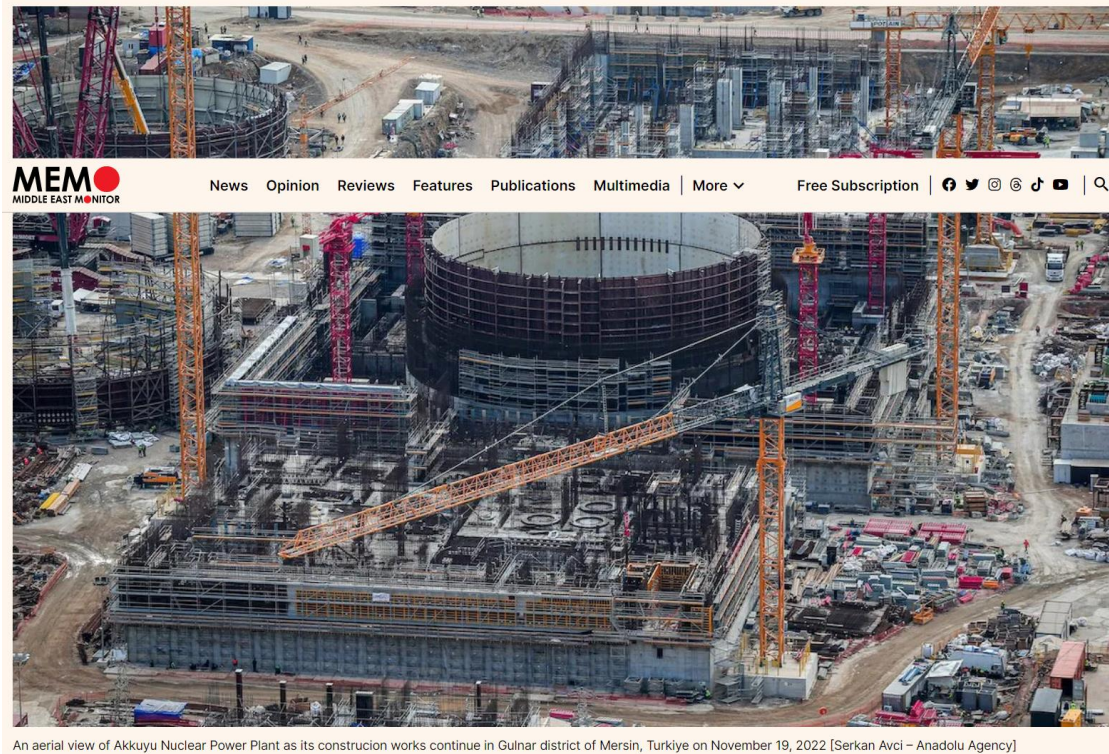


Figure 17: The Akkuyu nuclear power plant under construction, (Source: Middle East Monitor)

A top priority of the Turkish government is renewable energy. Instead of harnessing its own energy resources, Turkey currently spends more than \$50 billion a year on imported coal, natural gas, and oil.¹²⁰

In its shift to sustainable energy, Turkey is giving thermal power plants a lower priority than renewable energy sources. The Turkish government intends to include nuclear energy in its portfolio of energy sources. The implementation of green energy and clean technology solutions in Turkey has accelerated with the ratification of the Paris Climate Agreement by the Turkish Parliament in October 2021. The Turkish government has adopted a goal of achieving net zero emissions by 2053 following the ratification.

¹²⁰ Official Website of the International Trade Administration U.S. Department of Commerce.

Chapter 4

Conclusion: Energy challenges and prospect

Türkiye since its independence in 1923 has made a series of energy transitions. In the first period after the independence, from 1923 to 1945, the planning for the energy transition, mainly to electricity and oil, was characterized by state control but little progress. The reasons were economic difficulties faced by the Turkish economy, aggravated by the international economic crisis of 1928, which did not allow investment on energy sources and facilities and the attempt to stabilize the internal environment after a turbulent period. It is no coincidence that the energy base of the country was characterized by agricultural activities and coal.

In the period 1945-1983 more progress was made in the energy transition. Initially, in the 1950s, due to economic growth and the importance of oil and gas, energy policy contributed to the establishment of a state oil company. The country's entry into the exploitation of fossil fuels was combined with another transition: that of mechanization. Now, agricultural production is mechanized with the usage of tractors and trucks, which require oil and its derivatives. At the same time, the Turkish side tried to enter in the nuclear energy sector. This form of energy was gaining ground and Türkiye tried, unsuccessfully, to acquire it. However, the lack of liberalization of the energy market, combined with a recession at the end of the decade, caused a financial crisis.

The period 1960-1983 was marked by a further effort to complete the energy transition. Initially, the foundations were laid for the electrification of the country. In this sector, really, progress up to 1970s was minimal. The aim of the Turkish governments was to complete the transition to the era of electricity. Efforts to acquire know-how to use nuclear energy were also intensified, without success, as well. On the question of the liberalization of the energy market and the national economy, progress was negligible, while it also caused social tensions. Finally, regarding oil, the two energy crises demonstrated in the most emphatic way the need to reduce costs and protect energy security. The policies followed by the governments resulted in failure in the Aegean Sea on the one hand, and success in the energy

diplomacy with the Iraq-Türkiye pipeline on the other. Perhaps, one of the facts worth adding was the willingness of the Turkish governments not to hesitate to go ahead with underwater searches to find oil, natural gas and hydrocarbons, even if they trigger reactions and tension.

The next period 1983-2001 includes clear progress in the energy transition. The issues of environmental pollution and the great important importance that natural gas and oil have acquired, as well as the timid appearance of the value of RE, did not leave Türkiye indifferent. In the category of oil and natural gas, remarkable progress was made in conjunction with the energy foreign policy. Agreements were signed and pipelines were built that transported these two raw materials from the Caucasus and Iran. At parallel, the Ozal government sought to conduct oil exploration in the Aegean Sea. This move caused friction with Greece. The creation of an institutional framework for natural gas was a clear step towards achieving energy autonomy. In the 1990s, the country's transition to electrification was successfully completed, while the electricity sector was institutionally strengthened in 2001 and entered a liberalization phase. The establishment of EMRA was a breakthrough because it was going to regulate the liberalized energy market.

With the rise of Recep Erdogan to the leadership, Turkey has entered a new era in terms of its energy transition. From March 2003 to today, its progress is evident. To begin with, in the oil and gas sector the situation is better than before. Now, the country has diversified its suppliers, has emerged as a hub, while intensively researching to locate deposits in the eastern Mediterranean and the Black Sea. The case of the Sakarya-1 plot is typical of progress. At the same time, it proves that it does not intend to become completely independent of the two energy sources but is heading towards reducing their use without affecting energy security. Also, enormous progress was achieved in the institutional and legal framework. For the first time in Turkish history, so many laws were enacted to liberalize the energy market and impose rules. The lack of the legal framework was covered. Now, the domestic market has become more investor-friendly, as they know that the risk is more limited compared to the pre-Erdogan era. Finally, the country acquired a national strategy for the energy transition, a development that reveals the importance given to it.

Also, for the first time, Turkey crossed the threshold of RES. The impetus given was unprecedented. The construction of dams, wind farms (massively), solar energy utilization facilities and biomass utilization facilities managed to increase the share of RES in the energy mix. And the adoption of electric vehicles, even of domestic manufacture, signals the dynamic transition to a "green" development.

A dynamic stance was also taken in the field of energy foreign policy. The Turkish leader capitalized on the groundwork laid by his predecessors regarding the construction of a network of pipelines with neighboring countries. Pipeline diplomacy seems to have paid off by diversifying suppliers and working with different countries. At the same time, again for the first time so massively and to some extent successfully, the Turkish side conducted research and identified a deposit to exploit. And in the past, he had pursued it, but it possessed fewer means and was not successful. Of course, the Turkish attitude reasonably provokes reactions, because it is aggressive both in the Aegean Sea and in the EEZ of the Republic of Cyprus.

However, the energy foreign policy presents particularities in how it is practiced towards the EU and the UN. From the analysis, it appears that the Turkish government has, over time, been abiding by EU policies and directives¹²¹. This acceptance stems both from the governments' past efforts to join the country in the union, and from the fact that the desire for Turkey-EU convergence it has not disappeared from the plans of the Turkish president. Of course, the Middle Eastern country's accession process has frozen, but this does not mean that every bridge must be destroyed. On the other hand, it did not follow the EU's call to stop all imports of energy products from Russia. The same policy is followed within the framework of the UN. While it participated and participates in every climate-related conference, however, when it judges that a decision affects its interests, it does not hesitate to react until it succeeds, even if it concerns an international convention to be ratified¹²². At the

¹²¹ Onur Kulaç, Mısra Ciğeroğlu Öztepe, "The renewable energy policy of turkey under the impact of the European Union", *Visionary Journal, Süleyman Demirel University* 11, no. 28 (2020): 894 [981301 \(dergipark.org.tr\)](https://dergipark.org.tr/).

¹²² Türkiye, Ministry of Foreign Affairs, "United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol", accessed: October 19, 2023, [United Nations Framework Convention on Climate Change \(UNFCCC\) and the Kyoto Protocol / Republic of Türkiye Ministry of Foreign Affairs \(mfa.gov.tr\)](https://www.mfa.gov.tr/United-Nations-Framework-Convention-on-Climate-Change-(UNFCCC)-and-the-Kyoto-Protocol-/Republic-of-Turkiye-Ministry-of-Foreign-Affairs.mfa.gov.tr).

same time, it implements policies provided by this treaty! It is, therefore, an ambivalent attitude, in harmony with the interest-oriented foreign policy of the country.

Finally, for the first time in this field as well, Turkey is expected to enter the club of nuclear energy user countries. The Akkuyu facility, the primary project, is nearing completion, while procedures have been initiated for the other two nuclear facilities in Sinop and eastern Thrace. It is undeniable that the Erdogan government wants, like its predecessors, to include in the energy mix this form of clean energy as well.

So what challenges are on the horizon? What might be the future of Türkiye's energy transition? Türkiye faces several challenges. The most important ones can include further population growth, the desertification of the Middle East, energy crises and other externalities and the support of industrial production. All these situations give rise to the need to ensure energy security and autonomy. So, the country is expected to continue the path towards the energy transition. This will not include stopping the use of oil and natural gas, at least until 2060, but reducing it. At the same time, their use will be based on domestic means. In addition, an increase in the frequency of use of biomass, as well as solar and geothermal energy, is expected. The country has a great potential for utilizing the solar power as it belongs to the sunbelt states¹²³. The imminent construction of a solar energy facility in Konya with PV panels capable of generating 50MW of energy in 2025 signs the massive turn towards this form of RE¹²⁴. In addition, there are positive prospects to generate energy from offshore wind parks as it is encircled by the Mediterranean and the Black Sea¹²⁵.

The promotion of CE is another challenge. Türkiye has begun, but there are several efforts yet for integrating this type of economy into the transitional context. The *EU Action Plan (2020)* takes measures for establishing such policies like making the sustainable products the norm in the European market, ensuring less waste and leading global efforts for the implementation of CE¹²⁶. Possibly, the country will follow this action plan. In other words, the country will contribute to the fight against the climate crisis. What is more, of the utmost

¹²³ Erat, Telli, " Within the global circular economy: a special case of Turkey towards energy transition", 6, 8.

¹²⁴ " Konya solar PV park, Turkey", *Power- Technology*, last modified July 20, 2023 [Power plant profile: Konya Solar PV Park, Turkey \(power-technology.com\)](https://www.power-technology.com/news/konya-solar-pv-park-turkey/).

¹²⁵ US Department of Commerce. International Trade Administration, " Turkey, Green Energy and Clean Technologies", last modified April 22, 2022 [Turkey Green Energy and Clean Technologies \(trade.gov\)](https://www.trade.gov/turkey-green-energy-and-clean-technologies).

¹²⁶ Erat, Telli, " Within the global circular economy: a special case of Turkey towards energy transition", 5.

important is the reduction and the pause of using coal and lignite. The Turkish government has increased the production of coal within a legal framework, though¹²⁷. Worth mentioning is the fact that the Russo-Ukrainian war of 2022 did not affect the flow of Turkstream. It is functional and except Türkiye, it supplies Hungary as well¹²⁸.

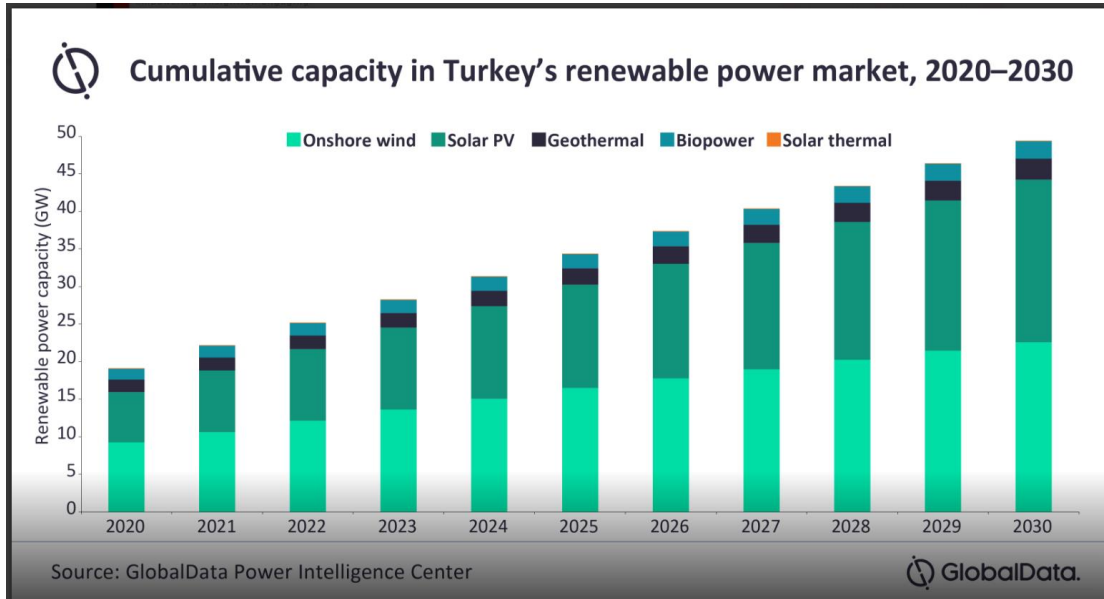


Figure 18: A graphic depicting the development and capacity of Türkiye concerning the RE. It is obvious that the major part covers the wind energy followed by the solar. (Source: Global Data via Solar Quarter)

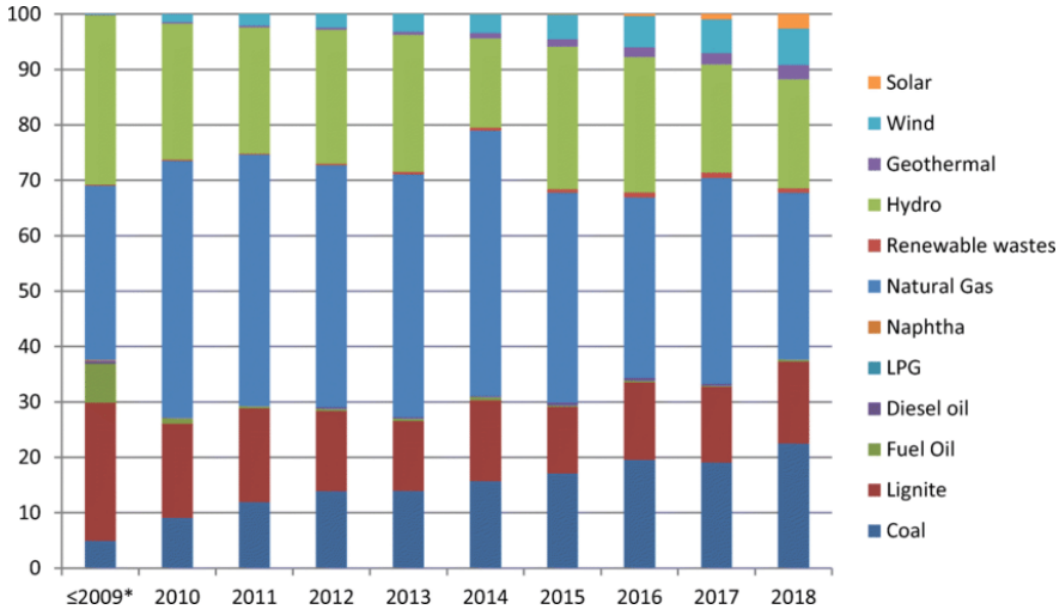
¹²⁷ "Turkey", EURACOAL, accessed: October 22, 2023, [Turkey | the voice of coal in Europe \(euracoal.eu\)](https://euracoal.eu).

¹²⁸ Stuart Elliot, "Turkstream gas link operation "secured" after Dutch permit return: Hungary", S&P Global, October 19, 2022, [TurkStream gas link operation 'secured' after Dutch permit return: Hungary | S&P Global Commodity Insights \(spglobal.com\)](https://www.spglobal.com/commodityinsights)

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Gross electricity generation by primary energy resources in Turkey by years (Turkish Electricity Transmission Corporation (TEIAS)2019; Turkish Energy Market Regulatory Authority (EPDK)2019)

Figure 19: The above diagram shows the electricity generation by resource from 2009 to 2028 (Source: Environmental Science and Pollution Research)

Analyzing more how relations between Türkiye and Russia were affected after the Russo-Ukrainian War, Türkiye profited from the conflict and the new international situation to boost its economic and financial interactions with Russia. Türkiye providing substantial economic and financial services for the Russian war effort. Türkiye ‘doubled’ its import of Russian oil in the first six months following the start of the war, increasing its imports from 90,000 to 200,000 barrels per day.¹²⁹ The energy cooperation between Russia and Türkiye reached a new height in October 2022 as a result of a summit between Putin and Erdogan in Astana, Kazakhstan, during which the Russian president suggested transforming Türkiye into a significant gas hub in order to transport Russian natural gas to Europe. This occurs while Putin claims that the Nord Stream 1 and 2 pipelines, which provide Russian gas to Germany, are no longer "reliable". Turkish imports from Russia in 2022 totaled \$58.85 billion,

¹²⁹ Vicken Cheterian, Friend and Foe: Russia–Turkey relations before and after the war in Ukraine, October 28 2023, <https://www.tandfonline.com/doi/full/10.1080/09592318.2023.2185443>

primarily in the form of coal, oil, and gas. With a 16.1% proportion of Türkiye 's imports that year, Russia surpassed China (11.3%) and Germany (6.6%) to become Türkiye 's main trading partner. Turkey even contributes to the stabilization of the Russian currency by paying for some of this energy in rubles, something that numerous Western nations have refused to do¹³⁰.

¹³⁰ Ian Parmeter, “Strategic ambiguity: Turkey, Russia and the war in Ukraine”, 2023 [file:///C:/Users/mfrentzou/Downloads/658e202f46e12%20\(1\).pdf](file:///C:/Users/mfrentzou/Downloads/658e202f46e12%20(1).pdf)

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