ENERGY SECURITY POLICIES OF THE REPUBLIC OF TURKİYE IN THE 21ST CENTURY:

CAN THE TARGET OF DECREASING ENERGY DEPENDENCY BE ACHIEVABLE?

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Abstract: Türkiye possessing sui generis characteristic features, its pursuing of domestic as well as foreign/security policies closely followed not only by its neighbours, but also by outer regional countries and international organizations, is trying to safeguard of its energy security policies. Because of the provision of political stability in the 2000s, the gradual economic growth annually has obviously caused the practise of great increases on residential and industrial/commercial energy consumption forming the foremost components of Turkish economic system. Türkiye, insufficient on oil and gas, is importing these resources with high dependence to close this gap in this field as well as to continue its sustainable development. That dependency happens at more than 90 % in these energy resources. Also, Ankara has been increasing efforts to discover hydrocarbons within its territories. So, to decrease its high dependence on energy imports in the 2000s, Türkiye has been attaching unique diversification efforts to reach a balanced energy mix by making huge investments into renewable energy resources as well as nuclear energy. In the 2030s and 2040s, Türkiye targets to become a less hydrocarbon-dependent country and have more clean energy systems via renewable energy (RE). Whether or not this target is accomplishable will be determined by conjunctural developments in the international energy world and Ankara's determinedness on reaching net zero carbon economics.

Keywords: *Türkiye, Oil, Natural gas, Nuclear energy, Renewable energy.*

Article Category: International Relations / Energy Politics

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21. YÜZYILDA TÜRKİYE CUMHURİYETİ'NİN ENERJİ GÜVENLİĞİ POLİTİKALARI:

ENERJİ BAĞIMLILIĞINI DÜŞÜRME HEDEFİ BAŞARILABİLİR Mİ?

Öz: Kendine özgü özelliklere sahip, yürüttüğü iç/dış politikalar sadece komşuları tarafından değil, aynı esnada bölge-dışı ülkelerce de yakından takip edilen Türkiye, enerji güvenliği politikalarını güvence altına almaya çalışmaktadır. Özellikle Soğuk Savaş sonrası dönemde 2000'li yıllarda siyasi istikrarın sağlanmasından ötürü aşamalı ekonomik büyüme, Türk ekonomik sisteminin ana parçalarını teşkil eden hane halkı ve sınai/ticari enerji kullanımında açıkça büyük artışların yaşanmasına yol açmıştır. Petrol ve gaz kaynakları açısından yetersiz durumdaki Türkiye, bu alandaki açığı kapatabilmek ve sürdürülebilir kalkınmasının devamı için bu kaynakları yüksek oranda ithal etmektedir. Bu enerji kaynaklarındaki bağımlılık yüzde 90'ın üzerinde vuku bulmaktadır. Ayrıca, Ankara, bu kaynakların kendi topraklarında keşfine yönelik çalışmalarını artırmaktadır. 2000'li yıllarda enerji ithalatlarına yüksek bağımlılığını azaltmak için, Türkiye, yenilenebilir enerji kaynakları ve nükleer enerji konusunda büyük yatırımlar yaparak dengeli bir enerji karışımına ulaşmak için özel çeşitlendirme girişimlerine önem vermektedir. 2030'lu ve 2040'lı yıllarda, Türkiye, daha az hidrokarbon bağımlısı bir ülke olmanın yanı sıra, yenilenebilir enerji ile daha temiz enerji sistemlerine sahip olmayı hedeflemektedir. Bu hedefin ulaşılabilir olup olmaması uluslararası enerji dünyasındaki gelişmeler ve Ankara'nın net sıfır karbon ekonomisine ulaşma konusundaki kararlılığı sonucunda belirlenecektir.

Anahtar Kelimeler: *Türkiye, Petrol, Doğalgaz, Nükleer enerji, Yenilenebilir enerji.*

Introduction

Türkiye, which holds unique distinguishing structures, its following of national as well as foreign/security policies carefully surveyed not only by its neighbours, but also by external regional states and international organizations, stands endeavouring to protect its energy security strategies. As a consequence of the establishment of political constancy in the 2000s chiefly in the post-Cold War, the steady economic development per annum has perceptibly triggered the realization of excessive rises on residential and industrial/commercial energy usage constituting the leading parts of Turkish economy.

Türkiye, inadequate on oil and gas resources, stands purchasing these resources with huge need to eradicate this breach within this field along with continuing its sustainable development. That reliance materializes at above 90 % within the context of those energy resources.[2] This circumstance institutes the most substantial part of budget gap of Türkiye as approximately a national income source worth of between $45-50 billion U.S. dollars remains allocated regarding energy purchases.[3] Here, it must be mentioned that meanwhile the finding of oil and gas, these two natural resources have been remaining to embrace indispensably noteworthy properties for energy security deliberations in the world. In this logic, there has been evolving multifaceted and dependent relationships between the suppliers of these properties and the states highly in need of them. In terms of energy suppliers, they have been lining up the demand security to sustain their political, economic, and social systems. Inversely, most of the industrialised and developing countries remain missing adequate quantities of hydrocarbons. Due to this motive, they require to procure these resources to sustain their systems. Thus, for the transference of these reserves by pipelines and tankers from suppliers to demanding states, there stands vitalness of transit countries. This state of affairs unsurprisingly produces demanding states' huge need over suppliers for the consistent conveyance of these resources and for their workable energy mixture.

Türkiye, locating between energy-rich states and energy-poor states cannot be measured autonomously from this authenticity. Owing to huge economic development rates in Türkiye began in 1980s and particularly practised subsequently 2000s, it has been developing into one

[2] Sina Kısacık (2021), "The Noteworthy Regional Energy Security Initiatives of Turkey in Recep Tayyip Erdoğan Period: Just Being a Transit State or More Than That?", in (eds. by Tayyar Arı & Mesut Hakkı Caşın) *Turkish Foreign Policy during JDP Era: Regional Coexistence and Global Cooperation*, Berlin: Peter Lang, p. 160.

[3] İsmail Kavaz (2021), "Türkiye'nin Enerji Kaynakları ve Politikası", in (eds. by Kemal İnat & Büşra Zeynep & Özdemir Daşcıoğlu) *Dünya Enerji Trendleri: Rezervler, Kaynaklar ve Politikalar,* İstanbul: SETA Kitapları 76, p. 48.

of the supreme economies of the world. In this logic, as a normal reason of this condition, Türkiye's energy usage has been snowballing step by step. Consistent with these facts, Türkiye has been endeavouring to establish collaborations with such energy rich states as Azerbaijan, Russia, Iran, and Iraq subsequently 1990s. Within this background, quite a few remarkable oil and gas projects have been put forward between Türkiye and these countries. Türkiye believes that the energy transference projects stand not only for guaranteeing its energy security, but also, they stand correspondingly advantageous for European energy security, seen as one of the chief energy customers in the world.

By the 2000s, an original feature has been counted in this energy calculation: the Eastern Mediterranean region. In the 2000s, there has been going on an excessive rivalry between Türkiye, other Eastern Mediterranean countries, U.S., Russia, and the EU on the finding and transference of this region's gas deposits exclusively into European markets which comprise soft power tools explicitly diplomacy and drilling ships along with hard power tools definitely naval and air forces. Similarly, in this setting, alternative region that has been coming into fore represents the Black Sea. While Moscow, Kyiv, Bucharest, Sofia have been seeking out hydrocarbons in this sea basin, Türkiye's finding of more than 700 billion cubic meters (bcm) of gas stands observed as momentously weighty progresses for the Eurasian energy security deliberations.[4] Türkiye remains one of the leading purchasers of liquified natural gas (LNG) within its region. Even though the proportion of piped gas to Türkiye stays much more than LNG, the share of LNG in Türkiye's gas importations has been snowballing gradually for divergence of suppliers' strategy followed by Ankara in the past few terms that stands equally anticipated in the following times.

Correspondingly, Ankara has been augmenting its efforts to find hydrocarbons in its territories. Accordingly, on the way to lessen its huge need concerning energy imports within the 2000s, Türkiye has been prioritizing to accomplish a well-adjusted energy mixture by allocating huge sums of money into renewable energy resources along with nuclear energy. As of the 2030s and 2040s, Türkiye stays aiming to turn out to be a less hydrocarbon-dependent country and hold much cleaner energy systems by means of renewable energy. Whether or not this goal stands realizable will remain determined by conjunctural changes within the global energy world and Ankara's firmness regarding holding a net zero carbon economics within the forthcoming terms.

[4] Sina Kısacık (2021), "The Noteworthy Regional Energy Security Initiatives of Turkey in Recep Tayyip Erdoğan Period: Just Being a Transit State or More Than That?", p. 160.

In line with the abovementioned context, this research article will endeavour to elaborate the energy security policies of Türkiye in the 21st century under its target of becoming a less hydrocarbon-dependent country in the following years. For this, this paper will firstly discuss some significant energy security parameters in the 21st century. Following this part, secondly, the paper will discuss the current state of affairs and future projections of energy mix in Türkiye. Then, thirdly, the paper will look into fossil fuels' policy of Türkiye by focusing on internal as well as external initiatives. Fourthly, the paper will elaborate on Türkiye's renewable energy policies (REPs), its initiatives. Fifthly, the paper will examine Ankara's initiatives from nuclear energy and thorium in terms of its energy mixture. In the Conclusion part, some personal analyses and recommendations concerning the researched subject will be set forth.

1. Some Significant Energy Security Parameters in the 21st Century

Daniel Yergin represents one of the most momentous researchers who attempted to speak the disputed concept of energy security all over the 1980s, when he offered his explanation as "*to guarantee satisfactory, consistent supplies of energy at reasonable charges and in conducts that do not put at risk foremost nationwide principles and purposes*". Accordingly, the most substantial threats and risks to energy security as specified by Yergin, do represent shocks, disruptions besides treatment of supplies that possibly will give rise to unpredicted and forceful increase within the milieu of prices, that will implement supplementary economic and political weight on the country. By explaining the energy security as the physical presence of adequate supplies at inexpensive charges, Yergin has highlighted that there happen plentiful features of energy security. The physical security is the first one that comprises protection of the resources, substructure, manacles of supply, and trade routes and ensuring the fast substitutions and exchange when required. Second one represents the vital worth of accessing into the energy which covers the ability to develop and acquire energy deliveries in physical, prescribed, and marketable conducts. The third one signifies that energy security is a scheme composed of nation-wide strategies and global establishments that are formed to respond in a harmonized method to disruptions, displacements, and also emergency circumstances counting the aid to permit the continuous flow of deliveries. Finally, and imperatively, for longer term, it obviously is the investment. Energy security dictates policies and a workable setting which appeal investment and progression and also invention to pledge that enough deliveries and system will be existing, in the correct period in the upcoming years. When measured from oil and natural gas purchasing states, they do deliberate for supply security. In contrast, the energy selling states have been lining up "*demand security*" for their hydrocarbons sales owing to the fact that

they stand in need of it for backing up the economic development along with a very giant share of government budgetary revenues and in order to conserving the communal stability. They request to admit that the markets will occur there consequently they stand capable of formulating their budgets and also justify upcoming phases of the investments.[5]

Firstly, it should be underlined that the energy demand is increasing and in the foreseeable future, it will continue to increase. On the other hand, it is not definitely certain that the reliable and stable supply that could meet this demand will be available. This situation comes into the fore the gradual increase of energy gap question between supply and demand. Estimations show that the total energy consumption increase in worldwide. For instance, in 2008, 505 quadrillion British Thermal Unit (Btu) energy would be consumed. It is expected that the energy consumption is going to increase to 609 quadrillion Btu in 2020 and 770 quadrillion Btu in 2035. The states comprising Organization for Economic Cooperation and Development (OECD) namely North America, Europe, South Asia, and Australasia's industrialized states responsible for most of the existing energy consumption in the world are going to increase their consumptions by 20 % until 2030 due to probability of continuously increasing of energy demands in terms of economic developments. But, the states mainly responsible for the increasing of consumption globally will be the newly rising/emerging states that are non-OPEC members. In this context, it is thought that their consumption is going to increase by 85 % till 2030. Primarily the rapid growth of Chinese and Indian economies changes the energy map of the world.[6]

Here, it should be discussed that the level of energy securities of political communities is measured by the existence of reliable and stable energy supply that will meet their energy demands in current times and near future. Even if the problem is felt more differently in global North than global South, all communities are facing the energy insecurity issue. The existence of powerful energy infrastructure in industrialized countries means that the energy security can be handled in the best state level. Chasing after the energy security by states of North having energy intensive economies is seen in terms of economic security. This approach of them has the ability to impact on the dynamics of international security and in the future, might end up

[5] Daniel Yergin (2012), *The Quest: Energy, Security, and the Remaking of the Modern World*, London: Penguin Books, pp. 268-269, Cited in Sina Kısacık & Ferdi Güçyetmez (2022), "European Energy Security: Can the Balanced Energy Mix Within the European Union Be Accomplished in the 21st Century?", in (eds. by Sina Kısacık & Ferdi Güçyetmez) *Global Energy and Geopolitical Transformation*, İstanbul: İdeal Kültür Yayıncılık, pp. 99-100.

[6] Sam Raphael & Doug Stokes (2017), "Enerji Güvenliği", in *Çağdaş Güvenlik Çalışmaları,* translated by Nasuh Uslu, İstanbul: Röle Akademik Yayıncılık, pp. 307-308.

with the experiencing of conflicts between states for fundamental resources. The inexistence of important energy reserves namely oil and natural gas in the territories of most of the world's top energy producers results in the intersection of energy security issues with more comprehensive foreign and security policies. The possibility of increasing international conflict and competition on energy reserves varies based on the theoretical approach that is employed. For realists, they are pessimistic on the continuation of liberal economic order in the future. Within this context, a fundamental question can be set forth as whether or not the central states will connect with each other in the case of decreasing energy stocks. Also, it must be asked that will the states be able to sustain cooperation through free trade regimes or will they withdraw into the backyard of national borders. Moreover, what will these preferences mean in terms of conflict between states? The historical materialists emphasize the importance of controlling the world energy reserves in terms of the development of global capitalism. They examine how and why the capitalist states of the centre try to continue their dominances.[7]

When we come to the Eurasia region, as of 2020, this region has nearly 60 % of world oil reserves and realizes nearly 58 % of the production as well as roughly 63 % of the consumption. According to International Energy Agency's 2021 data, this region which holds approximately 77 % of the world's proven natural gas reserves realizes nearly 70 % of the production as well as 82 % of the consumption. As stated by Statista's 2022 report, the 14-member countries of the European Union, former Soviet Union/Russia, China, South Korea, and India are the leading figures in terms of nuclear energy. As it is put forward by World Nuclear Association in 2021, 62 % of nearly 400 nuclear reactors in the world is located at the Eurasia region. Moreover, roughly 30 % of the world's proven uranium reserves are situated in Eurasia. The share of this region in global uranium supply is 50 % and 66 % of the regional production is just realized by Kazakhstan. On the other hand, when we come to the renewable energy production, almost 70 %, 67 % of consumption are realized by Eurasian countries. In sum, nearly 70 % of world's primary energy consumption occurs in Eurasian region. It must be underlined that the energy sector is unique and incomparable with any other sector in terms of production and consumption fields. The non-substitution of such energy products namely oil and natural gas with other products and the difficulty in storage make these two goods as inflexible ones in terms of

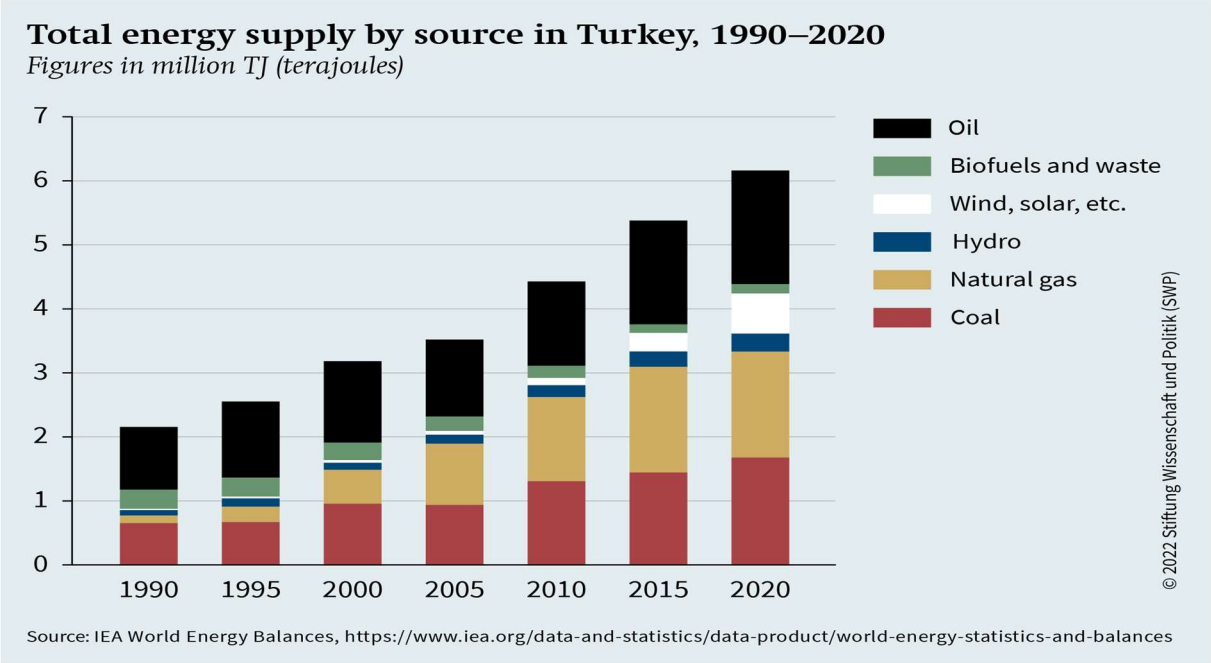
[7] Sam Raphael & Doug Stokes (2017), "Enerji Güvenliği", pp. 308-311.

supply-demand balance as well as it ends up with abnormal decreasing and increasing of prices in case of instability.[8]

It is impossible for countries that do not have energy securities to move forward meaningfully on the way to sustainable development. The fossil energy consumption forms unpreventable and concrete/stable damage over the global environmental balance. In addition to this, against the rapidly growing of world energy consumption, due to exhaustible and non-renewable of fossil fuels, have accelerated the search for new energy resources. The studies on increasing the renewable energy production in such fields as solar, wind, bio-energy, water resources and geothermal are importantly progressing. Despite this factor, it is considered that the renewable energy will be incapable of completely eradicating the dependency on fossil fuels in the foreseeable future of 40-50 years. It appears that the studies on discovering/inventing unlimited energy resource such as fusion technologies are not already in the bearing stage. Therefore, such fossil fuels as oil, natural gas and coal will continue to direct/guide the Eurasian energy policies.[9]

2. Fundamental Parameters of Türkiye's Energy Security Policies in the 21st Century

Figure I. Total Energy Supply by Source in Türkiye between 1990 and 2020[10]



[8] Muharrem Hilmi Özev (2022), "Küresel Enerji Görünümünde Yapısal Dönüşüm ve Avrasya", in (eds. by Arzu Al & Hayri Kaya) *Uluslararası Politik Ekonomide Avrasya*, Ankara: Nobel Akademik Yayıncılık, pp. 183-184.
[9] *Ibid*.
[10] SWP Comment (2022), "Decarbonising EU-Turkey Energy Cooperation: Challenges and Prospects", 29.03.2022, Date of Accession: 10.07.2023 from https://www.swp-berlin.org/10.18449/2022C23/.

Türkiye remains at an intermediate phase of the industrial development process, with constant growing in energy demand because of both increasing customer earnings and continuous development of energy-starving fundamental businesses. Henceforth, usage remains growing at solely above 4 % annually, in comparison with a decrease of 0.7 % yearly in Europe as a total. Nevertheless, per capita consumption stands still individually nearly 63 % of the European average, signifying that if per person earnings stay ascending to West European statistics, need is going to endure for increasing roughly 1/3 beforehand ultimately stabilize.[11] Türkiye's current Development Plan covering 2019 and 2023 undertakes sustained development in terms of energy need, nevertheless occurring in a yearly proportion lesser than that for the preceding decade. As of 2023, yet, as stated by the Turkish decision-makers' forecasts, for each person need will already stay under the existing level for Europe. Türkiye's main problematic stands that it holds inadequate inner deliveries of fossil fuels, and that extra sources have not been plentifully progressive, consequently standing profoundly in need of importations, which comprise nearly 70 % of energy usage. The 2019-2023 Plan alleges that that dependence is going to stand lessened, nevertheless is not pledging by self to slightly exact goal. It stands inadequate hard coal deposits: brown coal stays abundant, nevertheless holds small calorific value and results in noteworthy greenhouse gas emissions. Within the milieu of usage amongst diverse energy resources, the foremost variance amid Türkiye and the remaining Europe stays that presently Türkiye is not benefiting from nuclear energy, with a constantly snowballing portion for ember. Hydro-power makes up a huge amount of the overall in excess of remaining Europe, with a lesser share at present originated from further renewable energy sources.[12]

Moreover, it must be underlined that the targets of Türkiye in the energy field can be grouped under two headings that are increasing the local energy production and being a central country in terms of the global energy trade. The projects that are being carried out in coordinated with the policies in order to reach these targets continue. It is of great importance for such countries as Türkiye that are highly dependent on external suppliers in the energy to prefer diversification and to encourage the local energy production. The becoming of self-sufficiency in energy production is one of the leading final targets of Türkiye at the point of energy generation. Of course, reaching to this target is very far under these current circumstances, the studies carried out in terms of increasing energy production by national resources bear positive results. For instance, it is accepted that the provision of target of 30 % of total electricity production from

[11] William Hale (2022), "Turkey's energy dilemmas: changes and challenges", *Middle Eastern Studies*, Vol. 58, no: 3, p. 453.
[12] *Ibid*.

renewable energy in 2023 has also been reached. In addition to this, it is targeted to increase the volume of electricity production from local coal currently 40 billion KWh to 60 billion KWh in the near future. Moreover, in terms of electricity production, studies on augmenting the share of nuclear power plants 10 % at minimum by 2023 are going on.[13] In recent terms, the discovery and drilling activities of Türkiye carried out in the Eastern Mediterranean and Black Sea increases the motivation of Türkiye in terms of oil and natural gas discoveries. Primarily thanks to important discoveries in the Black Sea has changed the momentum within the context of discovery and drilling studies as well as it has begun to be put forward more realistic targets on this issue. Following the discoveries in the Black Sea, the discovery and drilling activities not only in this but also in the Eastern Mediterranean have accelerated. It is also targeted the realization of new discoveries in a very short period of time within the seas accepted as Blue Homeland. In addition to the continuing activities at the seas, the oil and gas discovery studies are continued at the land sections of Türkiye as well. Therefore, it can be said that Türkiye has been recording an important progress in terms of reversing its foreign hydrocarbon-suppliers based structure into in favour of itself.[14]

3. Fossil Fuels Policies of Türkiye in the 2020s

Another important target of Türkiye with regard to energy is turning out to be a centre of commerce in this field. Thanks to its geographical position, Türkiye connecting the world's most important supply and demand centres is one of the indispensable actors of energy transfer routes extending from east to west together with the geographical advantage. Thus, Türkiye's advantageous position does offer many opportunities for the country regarding its one of the final targets in the field as being a central country in the energy trade. Within this context, the accomplishments shown in TANAP[15] and Turk Stream[16] projects are regarded as reference points of Türkiye's standing as energy commerce base. By these projects, Türkiye has been playing a very critically important role within the context of not only ensuring its energy security but also many countries including the European continent. The subject of transfer of

[13] İsmail Kavaz (2022), "Türkiye'nin Enerji Ajandası", in (eds. by İsmail Kavaz) *Türkiye'nin Enerjisi: Politikalar ve Stratejiler,* İstanbul, SETA Kitapları 80, p. 22.
[14] İsmail Kavaz (2022), "Türkiye'nin Enerji Ajandası", pp. 22-23.
[15] Simon Pirani (2021), "Azerbaijan's gas sales strategy at a crossroads", The Oxford Institute for Energy Studies OIES Energy Comment, May 2021, Date of Accession: 19.08.2023 from https://www.oxfordenergy.org/wpcms/wp-content/uploads/2021/05/Azerbaijans-gas-sales-strategy-at-a-crossroads.pdf; Tuğçe Varol Sevim (2013), "Importance of TANAP in Competition Between Russia and Central Asia", *International Journal of Energy Economics and Policy*, Vol. 3, no: 4, pp. 352-359.
[16] Kinga Smoleń (2019), "The geopolitical dimensions of the TurkStream pipeline", Rocznik Instytutu Europy Środkowo-Wschodniej, 17, z. 4, pp. 101-121; Attila Virág (2018), "The TurkStream Pipeline in Light of the Security of Demand for Russian Gas", *European Scientific Journal*, Vol. 14, no: 29, pp. 16-35.

possibly to be extracted Eastern Mediterranean (EM) hydrocarbon reserves[17] and Türkiye's position in this context is another centre of discussion. It is accepted by most of the internationally famous energy experts that the most commercial, rational, and safe route to transfer the EM gas is Türkiye. Despite this issue, Türkiye has been facing some practices that violate political and international law rules in the region.[18] Within that context, since the discovery of Eastern Mediterranean hydrocarbon deposits, it is discussed two pipeline projects and one liquefied natural gas projects for the commercialization of Israeli, Egyptian, and Cyprus gas reserves. Despite the non-existence of mutually agreed exclusive economic zones, littoral states have been developing individual steps mostly resulting in the violation of other sides' rights and transforming the situation into the militarization of the confrontation.[19] Most renowned international energy experts and institutions do highly agree that the most rational, applicable, and the highest profit way of transporting EM gas is the construction of a pipeline between Türkiye and Israel. Within this perspective, Türkiye, Israel, and Egypt are endeavouring to increase the rapprochement processes between them.

Another prominent area that has been coming into agenda under the heading of Eurasian energy geopolitics is the Black Sea (BS). Since the end of 2017, Türkiye has been pursuing proactive activities in terms of searching hydrocarbons within the EM and BS through its seismic activity ships named as Barbaros Hayreddin Paşa and Oruç Reis as well as its drilling ships termed as Fatih and Yavuz. In this context, Türkiye's third drilling ship named Kanuni has also started to operate in August 2020. At the end of first result of these discoveries, 408 bcm of natural gas reserves have been found by Türkiye within its BS EEZ. It should also be mentioned that Türkiye's this discovery in the BS is seen as a very positive development by some experts such as Fatih Birol, the head of International Energy Agency, regarding this question. However, some analysts stand watchfully assessing this issue. As of 11 April 2023, on the word of then the Minister of Energy and Natural Resources Fatih Dönmez has underlined that Türkiye has discovered gas valued above $500bn in the BS. The overall size of deposits discovered within

[17] Daniel Yergin (2022), *Yeni Harita: Enerji, İklim ve Uluslar Çatışması,* Translated by Oya Özaltın, İstanbul, Nora Kitap, pp. 259-263.
[18] İsmail Kavaz (2022), "Türkiye'nin Enerji Ajandası", p. 23.
[19] Murat Yorulmaz & Sina Kısacık & Gamze Helvacıköylü (2022), "Rivalry in the New Geopolitics of the Mediterranean: Turkey's Geostrategic Vision and Its Effects on Foreign (Energy) and Security Policies", *Anemon Muş Alparslan Üniversitesi Sosyal Bilimler Dergisi,* Vol. 10, no: 1, pp. 417-431; Mehmet Bardakçı (2023), "Türkiye's Shifting Policies Toward the Cyprus Issue and The Eastern Mediterranean Dispute", *Dumlupınar Üniversitesi Sosyal Bilimler Dergisi*, Vol. 76, pp. 238-253.

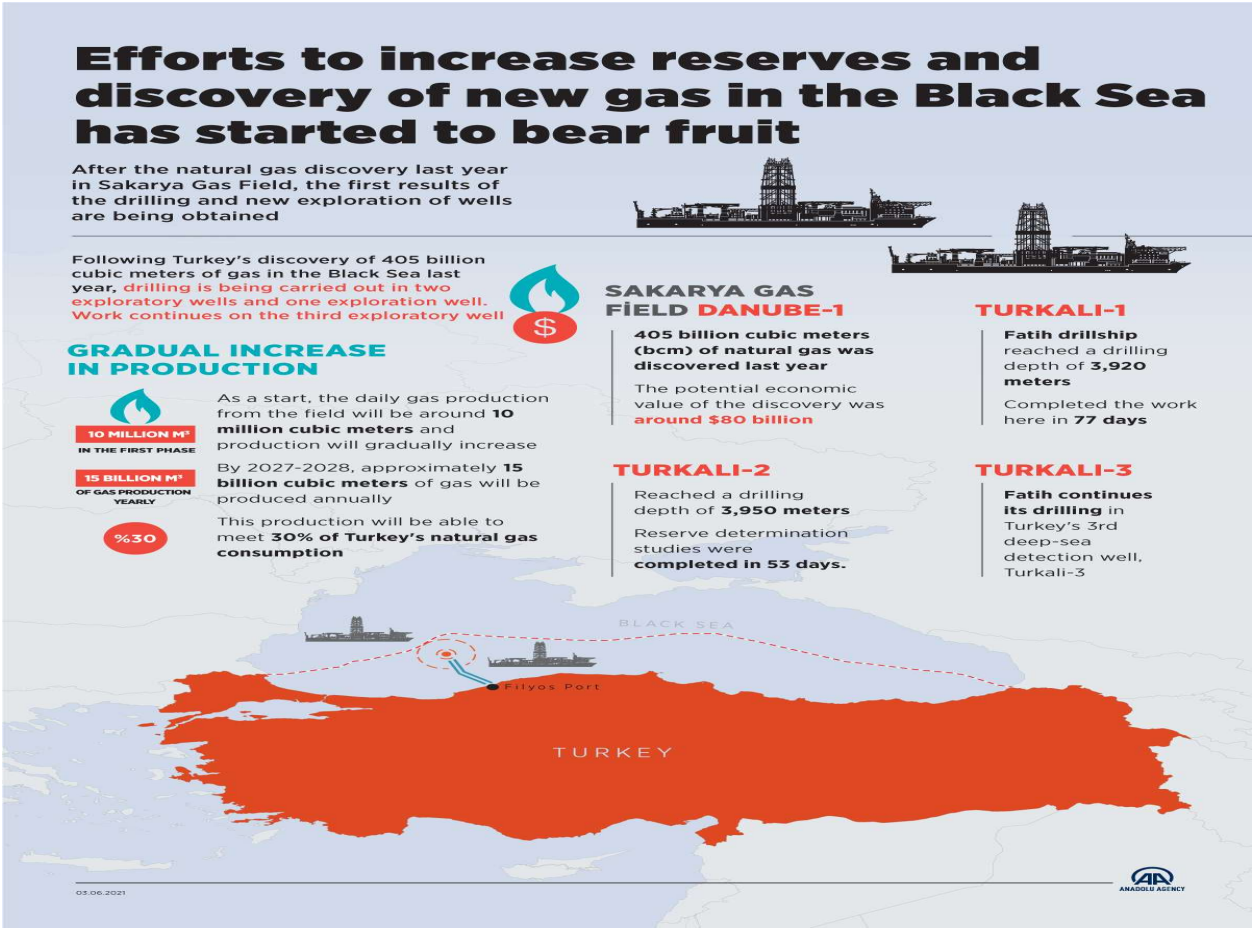
the BS stand above 700 bcm[20], single the biggest constantly found in that region. That discovery will stand sufficient to answer energy requirements of all residents within the territories of Türkiye for the following thirty-five years. When manufacturing energy usage is considered, that discovery is capable of responding to country's gas demands for the following 15-20 years. The Sakarya field will originally be producing nearly 10 million cubic meters (mcm) daily, progressively snowballing the volume to supply equal to 40 mcm daily within three-year term. Turkish state-controlled hydrocarbon purchaser BOTAŞ will be responsible for distributing the gas to homes from 2023 May ahead. The news possibly will aid Türkiye approach more energy liberation. At the moment, Türkiye purchases hydrocarbons from Russia, Azerbaijan, Iran, LNG from Qatar, the U.S., Nigeria, and Algeria. The BS findings is going to lessen Türkiye's need on gas purchases, which presently make up 99 % of country's usage in accordance with IEA estimations.[21] By 20 April 2023, Türkiye has begun gas production from a massive deposit found within the BS, that is committing for restricting its outward dependency besides decrease end-user energy charges. The progression of taking out natural gas will ensue within phases. 5 of the 10 shafts premeditated in terms of the opportunity of the initial level is going to stand made specially made following the inauguration, as well as lingering 5 shafts is going to be bespoken at the close of September 2023. The next generation stage stands anticipated to commence by 2026, and the third step stays programmed to instigate in 2028. By the second stage, whole home requirements in Türkiye will already stand included by domestic gas.[22]

[20] Felipe Sánchez Tapia (2020), "Geopolitical impact of natural gas discoveries in the Black Sea", IEEE Analysis Paper 37/2020, 25.11.2020, Date of Accession: 19.08.2023 from https://www.ieee.es/Galerias/fichero/docs_analisis/2020/DIEEEA37_2020FELSAN_gasmarNegro-ENG.pdf.

[21] Ashima Sharma (2023), "Turkey discovers natural gas worth over $500bn in the Black Sea", Offshore Technology, 11.04.2023, Date of Accession: 28.07.2023 from https://www.offshore-technology.com/news/turkey-discovers-natural-gas-in-black-sea/#catfish.

[22] *Daily Sabah* (2023/a), "Türkiye launches Black Sea gas deliveries in historic milestone", 20.04.2023, Date of Accession: 28.07.2023 from https://www.dailysabah.com/business/energy/Türkiye-launches-black-sea-gas-deliveries-in-historic-milestone.

Figure II. Black Sea Natural Gas Discoveries of Türkiye[23]



In terms of oil as well as natural gas exploration, the Anatolian geography has not yet sufficiently been examined in detail. But according to existing info, for Türkiye, oil is a source that has not abundant deposits, is just produced in few regions in limited reserves and lastly the existence of high dependence on foreign suppliers. According to the data of Turkish Petroleum (TP), Türkiye has nearly 0,02 % of world reserves with recoverable oil reserve of 366 million barrels. On the other hand, it just realizes nearly 1 % of global consumption. This huge difference results in Türkiye's high dependence on importation in terms of oil consumption by 91.2 %. By this rate, as stated by International Energy Agency, Türkiye is importing 31 million tons of crude oil importation. When the sectors that oil are consumed is taken into consideration, it is seen that between 2017 and 2022, more than 3/5 of total oil consumption has been made in transportation sector, nearly 1/7 in industry and ¼ in other fields. Considering these stats, it is commented on that the most important factor that determines the oil demand of Türkiye is the

[23] Nuran Erkul Kaya (2021), "Turkey's gas reserve volumes in Black Sea expected to rise", *Anadolu Ajansı*, 03.06.2021, Date of Accession: 15.07.2023 from https://www.aa.com.tr/en/economy/turkeys-gas-reserve-volumes-in-black-sea-expected-to-rise-/2263274.

mobilization of societal/economic activities and its implications on the transportation sector. Therefore, it can be expected that the increase in ownership of personal cars as well as the augmentation of demand to cargo services just as in the case of pandemic period result in the increase of the share of transportation sector. When the countries that have the most shares in the total importation of oil (including petroleum products) are elaborated, it is observed that among the top five are as Moscow, Baghdad, New Delhi, and Tehran for many years and also the fifth one changes from time to time as sometimes Riyadh sometimes Kuwait City. For example, as 2019, for the first time, Nur-Sultan has entered among them. Among them, it is viewed that Ankara is dependent on some of them more than others. While the average of Ankara's top three oil suppliers in the last 5 years is examined, despite the changing of them, the dependence on the first, second, and third have occurred as 27.9 %, 19.1 %, 14.42 % respectively. For instance, in 2020, the dependence on Moscow and Baghdad as the top two oil suppliers of Ankara has been 31.2 % and 29.1 %. When these numbers are evaluated, it can be mentioned that Ankara's crude oil trade with Baghdad and also Tehran, crude oil and petroleum products trade with Moscow and petroleum products trade with New Delhi have gained a structural continuity despite the changing volumes. The relations with other countries can show much more changes according to yearly conditions.[24]

In policy standings, the foremost subject for Ankara stands the charging of oil, and henceforth the influence of that issue on the balance of payments. But, similar to other oil-importers, it stands tiny that the government in office is capable of doing concerning this, due to that crude oil stands a standardised and extensively globally commercialized product whose charge remains fixed through international balance of supply and demand. Henceforth, crucial strategy urgency stays to regulate, and if probable diminish usage to comply with ecological requirements.[25]

Within the historical context, when Türkiye's demands to petroleum products have constantly been increasing, the rate of local outputs to meet these demands has gradually been decreasing. When the existing data is examined, it is observed that the local production is occurring roughly 3 million tonnes. On other hand, Türkiye which consumes yearly nearly 50 million tonnes of oil, the rate of total domestic production to meet the demand happens at about 7 %. Therefore, due to very high rate of dependency on foreign suppliers in terms of petroleum products, it is

[24] Serhan Ünal (2022), "Enerji Arz Güvenliği ve Dış Arz Güvenliği", in (eds. by İsmail Kavaz) *Türkiye'nin Enerjisi: Politikalar ve Stratejiler*, İstanbul: SETA Kitapları 80, pp. 133-135.
[25] William Hale (2022), "Turkey's energy dilemmas: changes and challenges", p. 455.

required to meet this demand from external suppliers. Most of Türkiye's local oil production is supplied from the drillings in Batman and Adıyaman regions. Based on the existing circumstances, the local production meets a very low portion of total consumption. Thus, in the name of increasing the local production, the discovery, and drilling studies are ongoing. In Türkiye, the studies on discovery and drillings for hydrocarbon resources at the onshore sections of Türkiye generally intensify in the Southeast Anatolia and Thrace regions. In terms of oil, it is known that the richest fields in Türkiye take place in Adıyaman, Diyarbakır, and Mardin. It must be mentioned in this context that 98 % of total local production is acquired from this geography. In addition to this, total 303 wells have been opened in this region to discover new resource deposits. Together with this, offshore sea discovery and drilling studies are ongoing to discover new reserve deposits not only in BS, but also within the EM. In Türkiye, total reserve volumes in the discovered fields are about 7.5 billion barrels. The recoverable/producible part of these reserves is more than 360 million barrels according to 2019 data. Moreover, thanks to the determination of new fields between 2009 and 2019, it is seen that Türkiye's total oil reserves is gradually increasing. On the other hand, in case of not discovering of new resource fields, it is calculated that in the country which the yearly 20 million barrels of local production is held, the duration of that producible reserve is nearly 18 years. Consequently, it can be said that it is a must thing to discover new reserve fields and the inclusion of country's resources into the economic system.[26]

TP has found 150 million barrels of oil in the Mount Gabar Area, southeast Türkiye as of 15 December 2022. Türkiye celebrates its 100th years of its foundation in 2023, and Ankara aims to enlarge its day-to-day production to 100 thousand barrels in that timeline. Erdoğan has too mentioned that TP's regular output, that happened unevenly 40,000 barrels in 2017 has nowadays augmented to 65 thousand barrels. The discovery has realized in the Sehit Esma Cevik-1 exploration well, and TP is planning for opening more than 10 additional assessment as well as output shafts in 2023. TP anticipates oil output in this area stands projected to occur as twenty-five thousand barrels daily at the last term of 2023.[27] As of 4 May 2023, TP has realized the biggest crude oil finding in onshore Türkiye with an assessed to possess 1 billion barrels of crude. The finding would occur in the south-eastern province of Şırnak (Gabar Mountain), which is bordering the semi-autonomous Kurdistan Region in Iraq and Syria. The

[26] İsmail Kavaz (2021), "Türkiye'nin Enerji Kaynakları ve Politikası", pp. 41-43.
[27] Smruthi Nadig (2022), "Turkish Petroleum discovers oil worth $12bn in Mount Gabar", Offshore Technology, 15.12.2022, Date of Accession: 28.07.2023 from https://www.offshore-technology.com/news/turkish-petroleum-discovers-oil-worth-12bn-in-mount-gabar/#catfish.

output objective stands established for 100,000 bpd, which might stay above duple Türkiye's oil output. The survey achievement stands projected to support accomplish Türkiye's energy liberation.[28] Within this context, by 7 June 2023, according to Turkish Petroleum, Türkiye's daily oil output per day has recorded its maximum phase within 32 years, motivated by the newest findings led by a gigantic discovery within the southern part of country's in earlier 2023. The day-to-day production has surpassed 70,000 barrels.[29]

On account of its swift development in excess of twenty years, natural gas has converted a vital resource in Türkiye's energy supply mixture. Ankara holds a central lead when compared with other buyers, since it remains neighbouring to such chief gas sellers – Moscow, Baku, and Tehran. Till 2001, Moscow would be the single seller, through a pipeline going by eastern Europe, nevertheless within this time, a substitute pipeline originated from Iran would be discussed for streaming. This would be trailed by two more pipelines from Russia going beneath under the BS ('Blue Stream 2003, and 'TurkStream' in 2020) along with a pipeline originated from Azerbaijan, going via Georgia. Therefore, Türkiye's gas imports from Russia have decreased from 17.6 bcm or in other words 46 % of the total within 2010, to 16.2 bcm, or 34 % of the total, as of 2020. By the later term, purchases originated from Azerbaijan would constitute almost 24 % of the whole, in consort with 11% originated from Iran, and more than 31% supplied through LNG, primarily originating from Algeria and also Nigeria.[30]

[28] Charles Kennedy (2023), "Turkey Makes Huge 1-Billion-Barrel Oil Discovery", Oil Price, 04.05.2023, Date of Accession: 28.07.2023 from https://oilprice.com/Latest-Energy-News/World-News/Turkey-Makes-Huge-1-Billion-Barrel-Oil-Discovery.html.
[29] *Daily Sabah* (2023/c), "New discoveries help lift Türkiye's daily oil output to 32-year high", 07.06.2023, Date of Accession: 28.07.2023 from https://www.dailysabah.com/business/energy/new-discoveries-help-lift-Türkiyes-daily-oil-output-to-32-year-high.
[30] William Hale (2022), "Turkey's energy dilemmas: changes and challenges", p. 455.

Figure III. Natural Gas Import Contracts of Türkiye[31]

Turkey's "take-or-pay" gas import contracts

Gasline	Origin	Bcm/annum	Expiry date	Contractee
South Caucasus	Azerbaijan (Shah Deniz 1)	6.6	April 2021	Botas
LNG	Nigeria	1.3	October 2021	Botas
West Line	Russia	4*	December 2021	Botas
LNG	Algeria	5.4	October 2024	Botas
Blue Stream	Russia	16	December 2025	Botas
Eastern Anatolia	Iran	9.6	July 2026	Botas
Tanap	Azerbaijan (Shah Deniz 2)	6		Botas
Total		**48.9**		
TurkStream	Russia	15.75		Botas

* Plus 10 bcm/annum contracted by seven private companies. Source: data collected by PETROSTRATEGIES.

Notwithstanding Türkiye's high dependency on energy importations, Ankara holds a serious part in supply route divergence. Exploiting this geostrategic strength, Türkiye seeks to place itself as an 'energy corridor' or even as an 'energy hub.' Freshly, the Turkish Foreign Ministry has similarly widely employed the 'energy trading centre' account. While politicians and specialists frequently practise these standings interchangeably, they hold diverse consequences. Türkiye being as an 'energy transit corridor' necessitates the creation and usage of a diversity of oil and gas pipelines, and related systems, linking Russia, the Caspian Basin, and the Middle East, not only to the Turkish market, but also to European end-users. Though, converting into an 'energy hub' remains a more challenging pursuit, meanwhile it dictates: widespread stimulus on a net of oil and gas pipelines as well as Liquefied Natural Gas trade, not only in terms of its capability to impact passage standings and settings, but also in re-selling some of the hydrocarbons transitory via this system. Henceforth, it stands notable that while the 'energy hub' concept, has remained principal in the official tale for a few decades, there stand correspondingly innumerable disapprovals concerning the practicability of this concept and the upcoming of a pipeline-grounded energy centre in Türkiye. Above all, these disapprovals point toward a diversity of tests counting the non-appearance of a legal-governing basis in Türkiye

[31] Civilnet (2021), "The discovery of gas in the Black Sea drastically broadens Turkey's options", 16.06.2021, Date of Accession: 20.07.2023 from https://www.civilnet.am/en/news/620839/the-discovery-of-gas-in-the-black-sea-drastically-broadens-turkeys-options/.

to permit for centre valuing, snowballing LNG trade, and the decarbonization paths in terms of European continent.[32]

Furthermore, Türkiye's rapidly increasing inner consumption, expensive dependence on energy exportations besides unpredictable foreign policy situation spoiled with global struggles produce an inconsistency between the striving tales and objectives of Turkish decision-makers and also intricate local changing aspects. Türkiye's extremely high dependency over purchased energy materials institutes the momentous test. Türkiye purchases 99 % of its gas and 93 % of its oil. Huge need of energy importation from Russia and Iran upsurges Ankara's weakness. In the outcome of a disaster in the relationships between Ankara and Moscow[33] as a result of the shooting of Russian SU-24 war plane along Turkish-Syrian border, Türkiye has endeavoured for increasing its initiatives in terms of differentiating its energy providers. Sanctions counter to Tehran have cut Ankara's energy purchases from this exporter. For instance, four years ago, Türkiye's gas purchases from Kremlin would be 33.6 % in overall, while 17.1 % would originate from Tehran. Growing energy collaboration with Azerbaijan has empowered Türkiye for getting 21.2 % of its gas from this supplier. Alterations and snowballing supply of LNG make available original divergence occasions for Türkiye too. Subsequently 2022, the U.S. has turned out to be the major LNG seller towards Türkiye. Growing acquisitions of American LNG have correspondingly reinforced Ankara's procuring situation regarding different traders. [34] As of 6 May 2022, Türkiye has remained amongst the topmost liquefied natural gas (LNG) purchasers in Europe last year, as international importations have grown 4.5 % year-over-year, as stated by the Paris-based International Group of LNG Importers (GIIGNL). Türkiye has bought 4.3 million tons of LNG from Algeria and 1 million tonnes from Nigeria. Norway, Egypt, and the U.S. have similarly underwritten to the country's importations.[35] On 31 January 2023, Türkiye has engaged a crucial liquefied natural gas buying contract with Oman for 1.4 billion cubic metres of yearly gas importations for 10 years.[36]

[32] Şuhnaz Yılmaz (2023), "Facing new security threats in an era of global transformations: Turkey's challenges of energy security, climate change and sustainability", *Turkish Studies*, Vol. 24, no: 3-4, p. 718.
[33] William Hale (2023), "The Turkey-Russia Relationship in Historical Perspective: Patterns, Change and Contrast", *Uluslararası İlişkiler*, Advanced Online Publication, 25 April 2023, pp. 1-16.
[34] Şuhnaz Yılmaz (2023), "Facing new security threats in an era of global transformations: Turkey's challenges of energy security, climate change and sustainability", pp. 718-719.
[35] *Daily Sabah* (2022), "Turkey 4th biggest LNG importer in Europe as global trade jumps", *Daily Sabah*, 06.05.2022, Date of Accession: 31.07.2023 from https://www.dailysabah.com/business/energy/turkey-4th-biggest-lng-importer-in-europe-as-global-trade-jumps.
[36] Nishant Ugal (2023), "Turkey signs multi-year LNG import deal with leading Middle East gas producer", *Upstream*, 31.05.2023, Date of Accession: 31.07.2023 from https://www.upstreamonline.com/lng/turkey-signs-multi-year-lng-import-deal-with-leading-middle-east-gas-producer/2-1-1395749.

4. Renewable Energy Policies of Türkiye in the 2020s

Türkiye in parallel with its strategy of "more local, more RE" strategy is attaching importance to renewable energy resources (RERs) very much. Primarily in terms of lessening external dependency as well as the diversification of production through internal dynamics, there exist ongoing studies regarding the increasing of share of RERs within the electricity production in Türkiye. Within the context of 2019-2023 strategic plan, the envisaged target to be realized in the energy field has been determined as the increase of RERs based established electricity power within the total established power from 59 % to 65 %. This shows the importance attached by Türkiye to renewable energies. When the distribution of RERs-established power among the resources is examined, it is observed that most of them is composed by hydro-energy based resources. Hydro-energy is followed by wind and sun energy respectively. It is accepted that the advancements in renewable due to the outcome of the geographic advantage that Türkiye has, are among the most important opportunities for the country. When the changes in terms of re-established power volumes between 2011 and 2020 are elaborated, within this term, the highest proportional increase has been experienced in solar energy. Together with this, the largest established power for Türkiye is hydro-energy resources. But when the increase in terms of percentage is examined, between 2011 and 2020, the source having the lowest growth has stayed the hydro-energy. The biggest reason of this situation is the usage of big potential of that resource which is based on water power. At the same time, the long duration of established power plants shows that this resource continues to be used. It is very clear that the applied active policies and promotion mechanisms in Türkiye have resulted in with the increase of whole RERs. Here the most important thing is the provision of continuation of increase in energy production potentials of the resources. In addition to all of these factors, Türkiye in which three parts of it is surrounded by seas, has the wave energy potential. The energy production starting in the offshore Black Sea is targeted to be included in RER centred production network of Türkiye. For instance, when the January 2021 data is elaborated, in Türkiye, energy has been produced from 576 established plants and 133 dam plants over the river resources. Moreover, 7.640 solar energy plants, 332 wind energy plants, 60 geothermal energy plants and 276 bio-cell/biofuel plants are operating.[37]

Türkiye has similarly sought after to reinforce the security of its energy supply by snowballing generation of RERs and dropping energy usage via augmented energy efficiency. Sales,

[37] Esma Gültekin Tarla (2022), "Kavram, Teknoloji ve Politikalar Kapsamında Türkiye'de Yenilenebilir Enerji", in (eds. by İsmail Kavaz) *Türkiye'nin Enerjisi: Politikalar ve Stratejiler,* İstanbul: SETA Kitapları 80, pp. 69-71.

particularly, have confirmed fruitful in decreasing charges and growing investments in renewables. Türkiye's renewable size has increased by 50 % over the preceding five years. As of 2019, Türkiye would have the fifth maximum stage of original renewable volume embellishments in Europe and the 15th uppermost within the world. The IEA report has set forth that Türkiye is capable of accomplishing even tougher progress in RERs – specifically solar, wind and geothermal – owing to its substantial resource grant. Its abundant capacity for development of RERs stands not restricted to electricity production nevertheless stays likewise applicable within the heating area. Remarkably, Türkiye solely benefits from a projected 3 % of its solar and also 15 % of its onshore wind capacity.[38]

Türkiye has announced plans to increase RERs use by 2035, but other aspects of its energy strategy remain under disapproval, counting constant investment in coal-fuelled and nuclear power plants. A National Energy Plan out in January 2023[39] outlines goals in the energy sector as of 2035, which, as stated by the Ministry of Energy and Natural Resources of Türkiye, stand in agreement with country's objective to access net zero carbon emissions as of 2053. Consistent with the strategy, electrical energy will be comprising 25 % of Türkiye's energy usage as at the second half of 2030s, going up from 21.8 % within 2020, whereas the portion of renewable sources within the connected power capacity has upsurged to approximately 65 % from 52 % by the first quarter of 2000s. Türkiye's fixed power capacity, which stood at 95.9 gigawatts (GW) at the end of 2020, will be reaching virtually 190 GW as of 2035, and three-fourths of the original power volume will be originated from renewable energy sources — a goal received by supporters of clean energy. Under the strategy, coal- and gas-fired thermal plans will be making up 34.2 % of electricity output by the second half of 2030s, decreasing from 57.6 % within 2020. Türkiye objects to upsurge the usage of RERs both within its total energy usage and power production.[40] For total energy usage, RERs will be accounting for 18.4 % in the first quarter of 2000s and also 23.7 % in the second half of 2030s. Electrical energy,

[38] International Energy Agency Press Release (2021), "Turkey's success in renewables is helping diversify its energy mix and increase its energy security", 11.03.2021, Date of Accession: 01.08.2023 from https://www.iea.org/news/turkey-s-success-in-renewables-is-helping-diversify-its-energy-mix-and-increase-its-energy-security.

[39] EnerData (2023), "Turkey's National Energy Plan for 2035 will boost solar and wind capacities", 05.01.2023, Date of Accession: 04.08.2023 from https://www.enerdata.net/publications/daily-energy-news/turkeys-national-energy-plan-2035-will-boost-solar-and-wind-capacities.html#:~:text=Overall%2C%20Turkey's%20installed%20capacity%20is,(54%25%20in%202021; Igor Todorović (2023), "Turkey aims to almost double electricity generation capacity by 2035", Balkan Green Energy News, 06.01.2023, Date of Accession: 04.08.2023 from https://balkangreenenergynews.com/turkey-aims-to-almost-double-electricity-generation-capacity-by-2035/.

[40] Mustafa Sönmez (2023), "Turkey plans to expand renewable energy but sticks to coal, nuclear", *Al Monitor*, 02.02.2023, Date of Accession: 04.08.2023 from https://www.al-monitor.com/originals/2023/01/turkey-plans-expand-renewable-energy-sticks-coal-nuclear#ixzz89PDDaBKw.

in the meantime, will characterise approximately 25 % of the final energy usage, with the established power volume increasing to virtually 190 GW. As a component of that goal, the portions of solar and wind sources will be reaching into 28 % and 16 %, separately. In terms of additional RERs, the connected volume will be reaching into 35.1 GW in hydroelectric power plants and 5.1 GW for geothermal and biomass plants. Therefore, RERs will be accounting for almost 65 % of the country's established power size as of the second half of 2030s. Increasing solar energy usage positions as the most motivated aim for RERs. The strategy foresees that the solar energy established volume will be reaching into 53 GW as of the second half of 2030s, a 470 % rise from 9.3 GW by 2022. [41]

President Recep Tayyip Erdoğan has formally opened what stands thought to stay Europe's largest solar power plant constructed on a sole place and one of the five biggest within the world. Established by Kalyon Energy, an associate of one of Türkiye's top corporations, Kalyon Holding, the solar plant within the central province of Konya asserts a fixed volume of 1,350 megawatts (MW). The Kalyon Karapınar Solar Power Plant commits for aiding Türkiye in terms of limitation of its massive energy purchases and supports ambition to increase renewable energy output that has by now stood boosted by huge-scale solar and wind power tenders. Over 3.2 million solar panels at the facility stand to produce 3 million kilowatt-hours of electricity per annum, adequate to make available power to 2 million people and avoid the usage of $450 million of fossil fuel corresponding resources. The $1 billion plant has by now begun generating electricity, will avoid 1.5 million tons of carbon emissions per annum and upsurge the portion of solar energy in Türkiye's whole energy output by 20 %. In additional milestone declaration in the ceremony, he has correspondingly publicized that Türkiye has similarly found high-quality petroleum in south-eastern Anatolia with a regular output volume of 100,000 barrels. He has underlined that Türkiye will no more remain a state dependent on energy reserves nevertheless will somewhat stay a state able to energy sales. He has similarly underscored that Türkiye has begun oil output within regions where oil wells were closed over allegations of no oil, and places that stood required to be closed because of PKK terrorist threats.[42]

As of 18 July 2023, Riyadh and Ankara have engaged in an energy contract intended at increasing collaboration in hydrocarbon production throughout a high-level meeting. The Kingdom's Crown Prince Mohammed bin Salman would negotiate with President Recep

[41] *Ibid*.
[42] *Daily Sabah* (2023/b), "Türkiye officially launches Europe's largest solar power plant", 02.05.2023, Date of Accession: 01.08.2023 from https://www.dailysabah.com/business/energy/Türkiye-officially-launches-europes-largest-solar-power-plant.

Tayyip Erdogan at the meeting, which happened in the President of Türkiye's three-state Gulf visiting. A memorandum of understanding would be contracted by Saudi Minister of Energy Prince Abdulaziz bin Salman and his colleague from Türkiye Alparslan Bayraktar. On the word of the Saudi Press Agency, the MoU includes the production, marketing, distribution and trade of refined petroleum products, along with the manufacturing of petrochemicals. It similarly includes the collaboration within renewable energy and electricity fields, besides the search of investment occasions between the two countries within that area. There has correspondingly a contract on examining electrical interconnectedness amid the Kingdom and Türkiye.[43] As of 20 July 2023, Erdogan would complete the abovementioned visiting accompanied by 13 deals predicted as $50.7 billion contracted in the United Arab Emirates.[44] The scope of the pacts and memorandums of understanding broadcast by both nations proposes a giant helping hand to Türkiye's economic system, which encounters extra pressure subsequently the shocking earthquakes in February 2023 that have cost the country in excess of hundred billion U.S. Dollars. Erdogan and UAE President Zayed Al Nahyan have participated deals contracted by officials of both countries in Abu Dhabi. These have covered sponsoring up to $8.5 billion for earthquake relief bonds and encompassing $3 billion in loan facilities for funding Turkish exportations. Supplementary contracts have included energy, defence and industry.[45]

5. Nuclear Energy and Thorium Policies of Türkiye in the 2000s

In order to increase the diversity in its energy mixture, Türkiye has been prioritizing to benefit from RERs and will be starting to use a modern energy type in the form of nuclear energy owing to the first reactor of Akkuyu Nuclear Power Plant envisaged to become operational at the first half of 2023. Türkiye has an important potential for nuclear energy resources. It is necessary to establish plants that need high investments to produce energy by benefiting from those resources. But due to the uneconomical and unnecessity of the establishment of these facilities in terms of within the today's circumstances, those resources in the country are awaiting its time for the energy production. In the forthcoming terms, in parallel with the increasing of nuclear power plants in the country, those resources will be included into the economy.

[43] *Arab News* (2023), "Saudi Arabia and Türkiye sign energy cooperation agreement", 18.07.2023, Date of Accession: 04.08.2023 from https://www.arabnews.com/node/2340061/business-economy.
[44] Sinem Cengiz (2023), "Will economy-driven Türkiye-Gulf relations yield political gains?", *The Frontier Post*, 31.07.2023, Date of Accession: 01.08.2023 from https://thefrontierpost.com/will-economy-driven-Türkiye-gulf-relations-yield-political-gains/.
[45] Sinan Tavşan (2023), "Erdogan ends Gulf tour in UAE with agreements worth $50bn", *Nikkei Asia*, 20.07.2023, Date of Accession: 01.08.2023 from https://asia.nikkei.com/Politics/International-relations/Erdogan-ends-Gulf-tour-in-UAE-with-agreements-worth-50bn; *Daily Sabah* (2023/d), "Türkiye says energy covers nearly $30B of deals signed with UAE", 31.07.2023, Date of Accession: 01.08.2023 from https://www.dailysabah.com/business/energy/Türkiye-says-energy-covers-nearly-30b-of-deals-signed-with-uae.

Moreover, the trade of those resources can be spread by following world nuclear energy usage trends. Within the context of energy production by benefiting from nuclear resources, two elements namely uranium and thorium come into the fore.[46] In the existing circumstances, the uranium is the most commonly used one among those resources. It is seen that the uranium reserves in Türkiye is located at the western part of the country and the thorium is mostly found in Eskişehir region.[47] When the distribution of resources at the territorial regions of the country is like that, the offshore fields are awaiting to be discovered. According to the current reserves, the total uranium reserve is about 12.614. Most of these reserves take place in Yozgat, Manisa, Aydın. Furthermore, searching for new reserve field around Nevşehir continues. In Türkiye which the studies on developing new reserve potential, one cannot talk about its production and trade yet. However, as a result of passing into a new phase of Türkiye's nuclear energy adventure continuing more than half century, in the forthcoming years, it is indispensable in increasing of uranium production and trade.[48]

In terms of thorium[49] as another important nuclear energy source, Türkiye has very important volumes. For the discovered thorium reserves, Türkiye comes after India in the world. Thorium which is a very important nuclear energy raw material holds the potential of turning out to be the future energy fuel by spreading in parallel with the technological developments.[50] In today's world, studies at the point of benefiting from thorium[51] as a fuel raw material of new generation nuclear power plants in such countries as Belgium, Brazil, Canada, China, Czech Republic, France, Germany, India, Japan, Israel, Netherlands, Norway, Russia and United Kingdom. In terms of energy production from nuclear resources, Türkiye has made important steps in recent years. Türkiye's initiatives for establishing nuclear power plants continuing for more than a half century has been realized thanks to the bilateral agreement signed between Türkiye and Russian Federation in 2010. As a result of this deal, it is planned to produce power of 4.8 GW from

[46] Muhammet Karataşlı (2020), "Nuclear energy and raw material reserves in Turkey", *ABMYO Dergisi*, Year: 15, no: 59, pp. 249-261.
[47] Melih Tokay & Cahit Erentöz (1959), "Uranium and Thorium Possibilities in Turkey", *Bulletin of the Mineral Research and Exploration*, pp. 80-99, Date of Accession: 01.08.2023 from https://dergipark.org.tr/tr/download/article-file/44132.
[48] İsmail Kavaz (2021), "Türkiye'nin Enerji Kaynakları ve Politikası", pp. 61-62.
[49] Thorium Energy World (2018), "Turkey Joins the Thorium Race", 06.02.2018, Date of Accession: 01.08.2023 from http://www.thoriumenergyworld.com/news/turkey-joins-the-thorium-race.
[50] Republic of Türkiye Ministry of Energy and Natural Resources (2023), "Thorium", 22.06.2023, Date of Accession: 01.08.2023 from https://enerji.gov.tr/info-banknatural-resourcesthorium.
[51] Numan Kalbitemiz Bodur (2012), "Thorium potential of Turkey resource and recent developments", Workshop on Recent Developments in Evaluation of Uranium and Thorium Resources, Lisbon, Portugal, 15-18 October 2012,
Date of Accession: 01.08.2023 from https://unece.org/fileadmin/DAM/energy/se/pdfs/UNFC/ws_IAEA_CYTED_UNECE_Oct12_Lisbon/19_Bodur.pdf.

four-part nuclear power plant in Akkuyu-Mersin. The first reactor of Akkuyu Nuclear Power Plant in which its groundbreaking was held in 2018 envisaged to be operational in 2023, and other three reactors are planned to be operational in 2024, 2025, 2026. Together with this, in 2013, it would be planned to construct a 4.480MW-capacity nuclear power plant in Sinop via the agreement between Ankara and Tokyo. But in today's circumstances, owing to not reaching of desired results in feasibility studies for timing and cost, the collaboration between Türkiye and Japan on this issue has been suspended. For this reason, the studies for finding a new supplier have begun for the nuclear power plant construction. Moreover, the feasibility studies for constructing third nuclear power plant are ongoing.[52]

It is planned to produce electricity from Akkuyu NPP as 35 billion kWh and from Sinop NPP as 34 billion kWh per annum. When Türkiye's daily electricity consumption at the end of 2019 as 304 billion kWh is considered, if those two NPPs have been operative, nearly 22 % of the total electricity demand would be met by nuclear energy today. Moving from this point, when the abovementioned projects are completed, it is envisaged that the share of NPPs in the electricity production of Türkiye will be at least 10 %. On the other hand, in parallel with the establishment of NPPs, it is planned to start production development studies by benefiting from nuclear technology in the fields of medicine, industry, agriculture, space technologies and satellite communication. Therefore, the nuclear resources do feature for contributing not only in energy production but also in various fields. In line with this issue, it is implemented several Research and Development activities by the support of universities, industry and public sectors.[53] In April 2023, a ceremony was made to signify the onset of nuclear fuel at the site. Rosatom has mentioned that the objective remained for physical inauguration to come to pass next year. Türkiye articulates that when whole four units stand functioning, which it expects will stay in 2028, it will afford nearly 10% of the country's electricity requirements.[54] As of 2 June 2023, the conclusion of concretization of the internal containment dome at Akkuyu 1 stands realized as an important building instant at Türkiye's primary nuclear power plant. [55]

Conclusion

[52] İsmail Kavaz (2021), "Türkiye'nin Enerji Kaynakları ve Politikası", pp. 62-64.
[53] *Ibid*., pp. 64-65.
[54] World Nuclear News (2023), "Concreting of Akkuyu 1's inner containment dome completed", 02.06.2023, Date of Accession 01.08.2023 from https://world-nuclear-news.org/Articles/Concreting-of-Akkuyu-1-s-inner-containment-dome-co.
[55] *Ibid*.

Türkiye has been undergoing high development rates subsequently 1990s. Meanwhile 1990s and 2000s, because of Türkiye's turning out to be one of the supreme economies of the world, the internal energy usage in the country has been snowballing gradually in line with this authenticity. Consequently, Türkiye has enthusiastically been including in quite a few oil and gas transference projects that aim to transmit the energy wealth of East to the energy-starving markets of the West. Türkiye advocates that both Russian settled energy projects like Turk Stream stands not against Southern Gas Corridor established by itself and Azerbaijan along with powerfully sponsored by the EU & U.S. In that milieu, Türkiye highlights that both these pipelines stay supportive of each other which correspondingly support in guaranteeing the energy securities of both itself and Europe. Similarly, within this basis, both primary energy suppliers precisely Russia, Azerbaijan, Iran, and Iraq besides extremely energy demanding countries of the West do deliberate that Türkiye's accepted energy bridge setting remains an excessive gain for them and Ankara too. By implementing its ever-growing part for energy transference within the Eurasian continent in 21st century, Türkiye has fruitfully been following positive parts for transfer of hydrocarbons in its eastern neighbourhood to western neighbourhood. In addition to the effective achievement of SGC directing to transfer the Azerbaijani abundant gas to both itself and European markets along with the Turk Stream that aims to send Russian gas towards Europe, Türkiye has been making efforts for the addition of transferring Iran and Iraq's abundant gas deposits to initially itself and then to Europe through itself. Nevertheless, political and security volatilities in Iraq by reason of terrorist actions and the execution of sanctions by the U.S. over the nuclear plan of Iran, the conveyance of Iraq & Iran's rich hydrocarbon deposits towards European markets by Türkiye appears extremely improbable for at best in short and medium timelines.

Within this milieu, a relatively brand-new factor coming into the forefront of Eurasian energy geopolitics since 2000s has been the Eastern Mediterranean.[56] The rich natural gas reserves discovered in Israel, GCA as well as in Egypt have resulted in the great and complex competition between the regional countries and outer-regional countries such as Russia and U.S. which have been attaching sui generis prominence to this region. In line with these facts, one of the most important issues coming into the agenda for the East-Med gas reserves is how they will be transported primarily to European markets. In that sense, two pipelines and one LNG option are comprehensively discussed in recent years. However, it should be underlined

[56] Mehmet Bardakçı (2022), "Turkey and the Major Powers in the Eastern Mediterranean Crisis from the 2010s to the 2020s", *Comparative Southeast European Studies*, Vol. 70, no: 3, pp. 516-539.

that transportation of these reserves by the construction of a pipeline over Türkiye is generally acknowledged as the most rational, economical and highly profitable one among these alternatives. Conversely, one should take into account the presence of several impediments on the commercialization of East-Med reserves specifically the Cyprus Question, Israel-Palestine Question and the mutual consensus on the delimitation of EEZs in the region and so on. Here, Türkiye has been strongly underlining the fact that any initiatives underestimating the rights of TRNC and itself are regarded as invalid. Therefore, to protect its and TRNC's rights in the East-Med, Türkiye has lawfully been developing proactive policies through benefiting from both soft and hard power means. These strategies of Türkiye should be considered as rational movements to protect the interests of both TRNC and itself. Türkiye's active involvement in the East-Med by using both diplomatic means such signing EEZs with TRNC and Libya, showing the presence of its drilling vessels, declaring navigational telexes (NAVTEX) as well as using its naval and air forces proactively are clearly evaluated by the regional states and outer-regional states as the game-changing sensible chess movements. In the near future, one should anticipate the continuation of Türkiye's decisive steps within the East-Med in the short/ medium / long terms.

Within this setting Türkiye's gas reserve discovery in the second half of 2020 at the Black Sea ought to stand assessed as a critically imperative progress for Eurasian energy security deliberations. Nonetheless it had better stand recalled that the time and forthcoming progresses (explorations and so on) concerning this substance will well make known the importance of this finding. Consequently, whole linked parties in that region will thoroughly stand observing the credible upcoming advances with regard to this question. Additionally, Türkiye's steps over differentiating its gas suppliers by concentrating on LNG imports must similarly remain reasonably significant step owing to plenty of gas and also low charges within the markets to guarantee its energy security in upcoming times. Within this framework, Türkiye's intensive initiatives on the discovery of oil reserves within the country should be seen as a very noteworthy development regarding the decrease of dependence on this issue. Several accomplishments have been recorded within this framework up until now. It is critically imperative on being determined for the continuation of efforts regarding this issue.

When we come to RE and other significant raw materials specifically uranium and thorium, Türkiye has been recording very noticeable developments. When the recent energy strategy papers are thoroughly examined, it is clearly seen that there has been ongoing process for the prioritization on the increase of RERs within the total energy mixture of the country. Türkiye

has been / will be allocating huge sums of investments for benefiting from nuclear energy, thorium, uranium and RERs by now and in the forthcoming which stand / will stand a beneficial initiative for country's becoming a net zero-carbon economy in the next years.

To conclude, Türkiye as one of the fastest developing country of world in the 21st century which celebrates its 100th year of foundation, is / will be one of the most central relative energy producers and huge energy consumers of the world. In the 21st century, Türkiye's rising prominence of energy transportation projects will be supported new initiatives. Also, in order to decrease its high dependence on external energy suppliers, Ankara continues to be determined on attaching special prominence on finding local hydrocarbon resources as well as increasing its investments on the use of RERs much more in the near and longer terms. The achievements with regard to this issue will be effective of Türkiye's turning out to be a relatively energy independent country in the twenty-first century's forthcoming terms.

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