

Gas in the Black Sea: Initial Assessments & Critical Questions

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(Celal Güneş - Anadolu Agency)

The weight of critical introspection on the discovery, fair or otherwise, should not overshadow the fact that Turkey has discovered natural gas in the Black Sea, and that for a country that has had to be so dependent on external imports, any development that helps alleviate such a condition is good. There is of course a process, and a litany of moving pieces need to come together to ensure that the gas is brought to market in a competitive fashion. Further discoveries to be had in the Black Sea will strengthen the economic case, as well as the interplay between domestic demand and the nature of global energy supply. This outlook explores some of the critical questions at stake going forward.

Introduction

“Turkey begins where the oil fields end”, as the popular idiom has it, after modern-day Turkey was salvaged from the ashes of the Ottoman Empire. As such, Turkey, unlike other countries in the region has had to almost entirely rely on oil and natural gas imports so as to help satisfy primary energy demand. This remains the case for the time being, despite the recent and impressive enhanced uptake of renewables. In terms of primary energy demand, Turkey is approximately [75% dependent](#) on external sources (Figure 1). Figure 2 below stratifies Turkey’s primary energy demand by fuel type. In terms of natural gas, on the supply side Turkey is 99% dependent on imports¹, with [46.83 billion cubic metres](#) (bcm) imported last year². These are figures for both pipeline natural gas and liquefied natural gas (LNG), the latter of which has been penetrating into the Turkish market³. Turkey’s total energy import bill has ranged in recent times between [\\$35-50 billion](#). [\\$12 billion](#) was spent on natural gas imports alone last year, of a total energy bill of [\\$41.7 billion](#) (approximately 5.5% of GDP). Turkey has registered year-on-year growth in terms of primary energy demand from [2009-2019](#) (Table 1). A [4.2%](#) decline in the total cost was registered compared to 2018. In February this year, the Turkish government projected increases in the energy import bill up to \$45.7 billion, given estimates of benchmark Brent oil prices (ibid.). [Figures for 2019](#) are as follows: 33.61% of Turkey’s natural gas (via pipeline), came from Russia, 21.20% from Azerbaijan, and 17.11% from Iran – all neighbouring countries⁴. The remaining 28.1% of demand was met by way of LNG imports, largely from Algeria, Nigeria, but now increasingly the United States as well as various other sources of spot LNG. The ability to diversify sources of supply reflects changes in a now [more global LNG industry](#), namely lower LNG prices (as a function of supply and demand) alongside LNG trading in terms of spot transactions rather than long-term, inflexible, point-to-point contracts) [2020](#) imports thus far suggest a 44.8% and 41.5% year-on-year decrease in Iranian and Russian natural gas imports. Overall, pipeline natural gas imports have fallen 22.8%, whilst LNG imports increased by 44.8% between January and June of this year. [Cheaper spot LNG prices](#) amidst what has been termed a [global gas glut](#), have galvanised greater LNG penetration into the Turkish gas market), allowing Turkish importers to undercut previous oil-indexed deals. Turkey’s Petroleum Pipeline Company (BOTAS) has [taken advantage](#) of the relatively cheaper cost of LNG imports, making the [majority of imports as of late](#) as opposed to the private sector. Turkey recently emerged at one stage as the [second largest importer](#) of U.S. LNG in Europe. Though still not the source

of the majority of the country’s natural gas imports, a recent trend has seen a 144% increase in LNG imports from the U.S. that was been registered from the first half of 2019 to 2020.

On the demand-side, natural gas demand in Turkey has actually [fallen slightly year-on-year](#) since 2017 given weaker economic growth but also inter-fuel competition, having steadily increased year-on-year since 2009 (Table 2). Turkey has in recent times tried to [reduce the use of natural gas for power generation](#) and as such alleviate the burden of dollar-denominated gas imports.

Looking at figures from 2013 onwards, Turkey remains a premium gas market ranging between 45-50 bcm (a peak of 55.25 bcm registered in 2017), with [52.02 bcm](#) of natural gas expected to be consumed in Turkey in 2020 (Table 2). What, if any, the overall effects of the pandemic will be on that figure remains to be seen, though a [3.8% decrease between January and June](#) compared to the same period in 2019. For an emerging economy such as Turkey that has grown rapidly ([on average 5.2% per annum between 2001-2017](#)), but has at the same time become more vulnerable to external factors, footing energy import bills fuels the country’s current account deficit figures; an issue that governments have long since sought to tackle including the current Turkish government with its Vision 2023 policy. Though the price of imports of say, a barrel of benchmark crude oil or spot natural gas prices, may wax and wane over time, (thereby reducing the pressure on the economy in times of low commodity prices), the need to reduce dependence on energy imports more thoroughly is well-established in the country, given both concerns related to notions of energy security, but more so economic necessity. Any economic woes can also be the subject of geopolitical leverage. Per usual, it is very rare for a discussion of natural resources to refer solely to natural resources. The meaning and/or significance of the discovery can only be deduced through relative means. It is “human appraisal”, in the words of the oft-cited resource economist Erich Zimmermann, is what turns the “neutral stuff of the earth” into resources. Here questions of: energy security, local, regional, but also global dynamics of supply and demand, as well competition between fuels for different uses, all come to the fore in a complex and dynamic way to meet any given country’s needs. The current government has overseen attempts to that effect, as now expounded upon alongside what is known about the Black Sea discovery thus far. Now that media spectacles have somewhat abated, a more sombre appreciation can ensue.

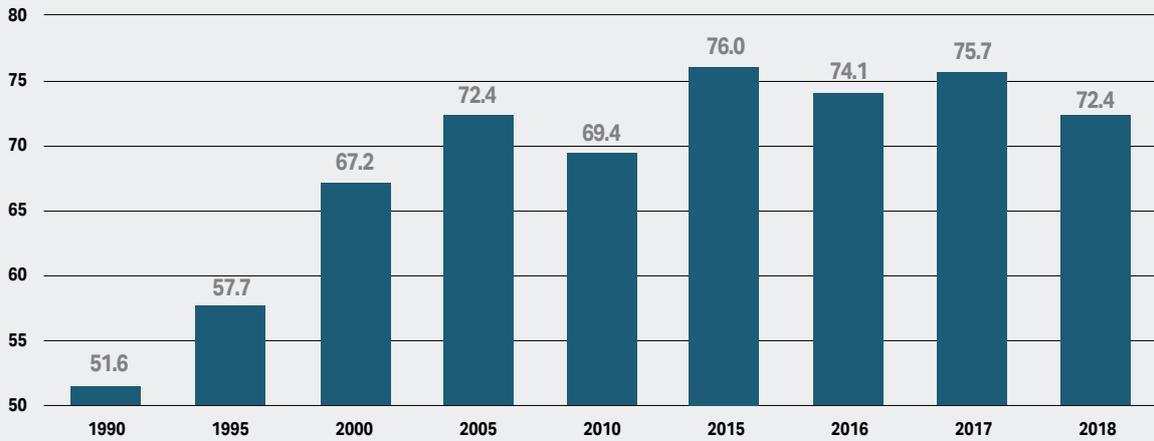
1 Turkey is also 92% dependent on external sources for oil supply (European Bank of Reconstruction and Development, 2019).

2 A figure of 45.3 bcm has also been cited for Turkey’s 2019 total natural gas import by the [Daily Sabah](#).

3 Turkey’s [Energy Market Regulatory Authority](#) (EMRA) provides more granular detail as to the nature of the country’s natural gas market.

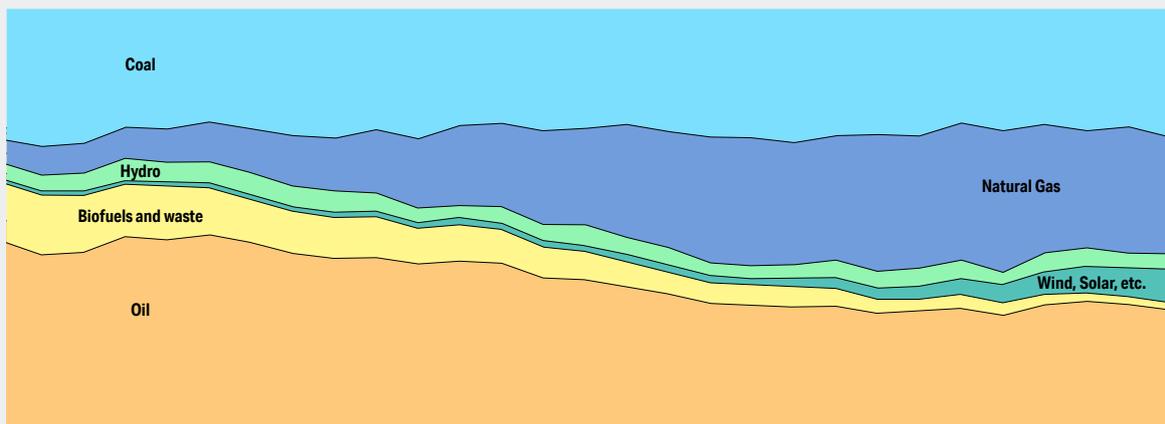
4 The first purchase agreement was signed with Russia in [1986](#), whilst the first natural gas from Azerbaijan came in 2007. LNG first arrived from Algeria in 1994.

Figure 1: Turkey's External Dependence for Primary Energy Demand



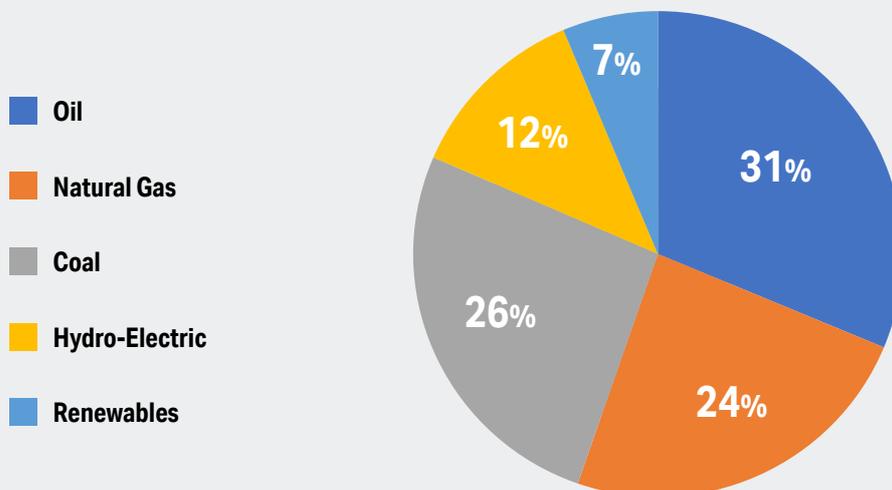
Source: ING 2020 <https://think.ing.com/articles/black-sea-energy-more-to-prove/>

Figure 2: Total Primary Energy Supply by Fuel (%), Turkey, 1990-2018



Source: IEA 2010

Figure 3: Primary Energy Consumption by Fuel, Turkey, 2019



Source: BP Statistical Review of World Energy, 2019

Table 1: Primary Energy Consumption, Turkey, 2009-2019

YEAR	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary Energy Consumption (exajoules)	4.28	4.50	4.81	5.11	5.07	5.23	5.72	6.01	6.37	6.29	6.49

Source: BP Statistical Review of World Energy 2019

Table 2: Total Natural Gas Consumption, Turkey, 2009-2019

YEAR	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Gas Consumption (bcm)	36.87	37.41	44.15	45.24	45.92	48.72	48.89	46.35	55.25	50.28	46.83

Source: EMEA (2020), Oxford Institute for Energy Studies (2017), BOTAŞ (cited in Hurriyet Daily News 2020).

The Black Sea Discovery – What We Know Thus Far

Ever since the announcement on Wednesday 19th August that President Erdoğan would make a major announcement of “good news”, reports suggested Turkey had finally discovered offshore natural gas resources at the ‘Tuna-1’ exploratory well in the Black Sea. [Initial indications](#) suggested that the ultra-deepwater Fatih Drillship had encountered an estimated 26 trillion cubic feet (tcf) – or around 800 (bcm) – of natural gas resources potentially in place. Still the largest discovery in the Black Sea to date, the official figure was announced to be an estimated 320 bcm (around 11 tcf), the discovery having come after a total of nine exploratory (or discovery) wells had been drilled. Further appraisal drilling will most likely result in the revision of the figure, upwards as Turkish officials have it. At the moment, at what confidence band (possible, probable, or proven) the resource exists is unclear. The well is [said to be](#) some 150km from the Turkish coastline, within Turkey’s zones of maritime jurisdiction, delimited in the Black Sea according to UNCLOS principles with the relevant littoral states, though Turkey is not an official signatory to UNCLOS. [TPAO](#) – the Turkish state-run hydrocarbons company – said that “approximately 2 billion barrels of recoverable oil equivalent” was also present. Natural gas from the Black Sea, if commercially exploited, may present a source of supply largely insulated from insurgent attacks. For example, the PKK terrorist organisation has sabotaged natural gas pipelines before (but with seemingly minor and temporary success). With tensions generated from the unresolved Cyprus Problem,

the discovery of natural gas and its possible effect on the settlement talks, the series of overlapping and contested maritime boundaries, as well as regional geopolitical rifts drawn into it all such as Libya, or rising Gulf-state agency in the Eastern Mediterranean), Turkey and the Turkish-Cypriots have felt themselves facing efforts to ostracise them from the region. In partial response, Turkey has gone on to establish its own offshore hydrocarbons exploration and exploitation capabilities (Figure 4) by acquiring three drillships: Fatih, Yavuz, and Kanuni. There is an inclination to contrast the state of play in the Eastern Mediterranean with that of the Black Sea. The first thing to note is that maritime boundary delimitation in the semi-enclosed Black Sea is for all intents and purposes complete, as opposed to the pastiche of overlapping maritime boundary claims that mirror unsolved and emerging geopolitical fault lines in the region (Figure 5).

Turkish officials have asserted that further appraisal drilling is to come, as well as more exploratory drilling in the region. Turkish Presidential spokesman Ibrahim Kalin asserts that further discoveries are expected, and that the current discovery is “just the beginning”. The upward revision of the Tuna-1 discovery is expected, but there will inevitably be geological, technical, and market risks to then consider in the process to bring gas to market. At the moment, as an estimate the find is comparable in size to the 318 bcm Tamar field offshore Israel, and can be classified in the industry as a giant field. A bold date of 2023 was given for the commencement of production; a symbolic date given the centenary of the Republic of Turkey. Then again, the country does not seem to shy away from bold targets, and in principle, there have been offshore natural gas fields around the world that have been brought to market in less than three years from discovery. TPAO further stated that it had drilled 4,525 metres in the Tuna-1

drill site in the exploration block named Sakarya, after the Battle of Sakarya in the Greco-Turkish War of 1919-1922. The discovery itself, according to the Turkish Energy and Natural Resources Minister Fatih Dönmez, was made at a

water depth of 2,100 metres. News of the discovery is not only good for Turkey, as it reaffirms hydrocarbon potential vested in the Black Sea, attention upon which seems to have waned as of late.

Figure 4: TPAO's Fleet

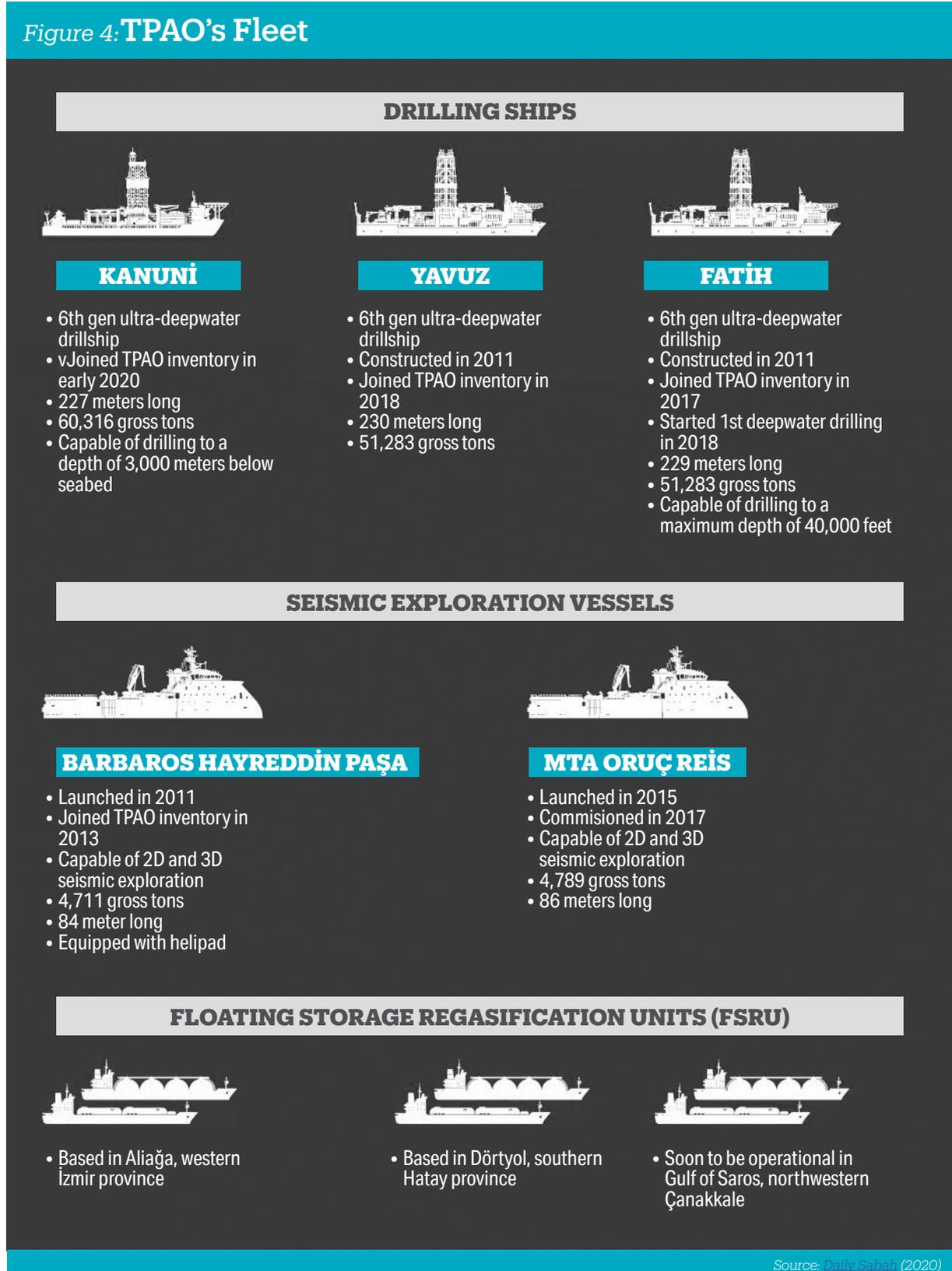


Figure 5: Turkey's First Black Sea Discovery



The Long Road Ahead

Commercial exploitation is, of course, not a given, nor a seamless transition. There are many contingent variables that have to align. Further appraisal drilling usually occurs in order to produce more accurate and probable assessments of the total volume of natural gas said to exist at the site (a popular assertion within the industry is that the point in time where the most will be known about any given discovery is at the end of the production life cycle). Then comes the process to establish the resource's commercial viability which, if successful, will lead to transforming a prospective resource to an economically recoverable and proven reserve (as opposed to what is known as a 'stranded resource' if the process ultimately fails). Here, issues of: resource volume, field characteristics (how easy is it to extract), liquids presence, climate policies and how natural gas will fit into the energy mix, price (benchmark prices, discount rates), development pathway, timeline of exploitation, capital and operational expenditures, financial capacity, as well as technical expertise and so on, all come into play in the process to move gas to market. Pending these considerations and more, how much natural gas Turkey will be able to produce per year will then figure in considerations to come of both the country's energy security but also economic concerns. Speaking to Anadolu Agency, [APLUS Energy's Volkan Yiğit](#) boldly reasoned that the "cost of producing natural gas from the reserve will fall below our current contract prices under any circumstances", whilst [Minister Dönmez](#) has stated that "the gas we will produce will be more economic than the gas we import", but without exact clarification of which supply pathway is being compared and contrasted. Again, further appraisal is needed, but given this caveat, speaking to Anadolu Agency, the head of the International Energy Agency, Fatih Birol, still surmised that an investment of approximately [\\$6 billion](#)

would be needed to commence production, and that the discovery as it stands was worth \$80 billion (though no further details on the pricing mechanism yet, or whether the investment figure relates to full field development to plateau, a phased approach, or for offshore production only). How exactly the resource will be developed, marketed, and how the process will go on to impact Turkey's domestic energy balance and mix, only time will tell. But for the most part it is almost certainly the case that the Turkish domestic market will be the target for Black Sea natural gas. There are a myriad of moving pieces within the global natural gas industry (but also as it concerns more local and regional factors) that would need to be favourably aligned to commercially export the resource. As an aside, Turkey already exports albeit very modest amounts of natural gas to both [Bulgaria and Greece](#).

Collateral benefits already seem to be afoot. Turkey also is near the end of a [16 bcm](#), 25-year contract for Russian natural gas (long-term contracts are common in the import of pipeline natural gas). There is word that Russia is now offering another contract for pipeline natural gas on reduced terms. According to [Montel](#), Turkey is one of the last places where Russia's Gazprom still insists on oil-indexed gas prices, a position bolstered by the sheer reliance Turkey historically has had on Russian natural gas. The discovery of Black Sea natural gas may of course have nothing to do with the new offer, but everything to do with Turkey's efforts to reduce imports from Russia which it has done so steadily. Imports of U.S. LNG have conversely increased. Negotiating price cuts today then, if true, would already be a blessing for the Turkish economy. In the future, Turkey seeks a fully liberalised gas market, to pivot away from take-or-pay contracts and instead be a home to a competitive regional [trading hub](#), and plenty of work remains to be done since the 2001 Gas Law in the country, as well moves [Figure 5: Turkey's First Black](#)

Sea Discovery Source: Bloomberg 2020 toward the potential unbundling of BOTAŞ. In the longrun, downturns in the global natural gas industry will also have to be considered. Tighter oil and gas markets may go on to result in the sort of higher prices⁵ that spur on the next bout of activity in the commodity cycle. TPAO, as a state-owned entity, will not have the same portfolio of assets, liabilities, or goals, as say an international oil and gas company. What may affect the process to bring Black Sea gas to the market, all else equal, is how exactly Turkey will go on to finance the process.

Natural Gas Amidst the Renewable Energy Scene

How might, if at all, the discovery impact the country's emerging commitment to renewable energy? This is a complex question. In any such analysis, mapping must occur between fuel and end use, as well as any future trends on the horizon, particularly as it comes to gas pricing and inter-fuel competition, issues of capacity, efficiency, and utilisation. Briefly, much of the discussion at this point revolves around power or electricity generation, both of which are sometimes unhelpfully used synonymously with energy without much regard for other end-use destinations such as: industry, residential heating, or transport sectors. For context, [nearly half](#) the natural gas Turkey consumes is said to be for heating purposes. There is plenty of room here to improve residential efficiency measures, though this may in turn then go on to reduce gas demand. Issues of fuel competitiveness, security of supply, and environmental factors, will all also feature in the discussion. That being said, it is likely given the scenario at hand that existing natural gas imports may be displaced somewhat and for some time. A large and sustained influx of domestic natural gas may incentivise further gasification of the domestic market (if there is room to do so), raising the sort of demand that then raises price, which may in turn make commercial exploitation of Black Sea natural gas (and the gas to come), all the more lucrative. The picture here becomes complicated. Turkey's provinces may already be well-gasified, so the question of how to raise further demand may have to be considered in more depth. How might any insistence to raise uptake of natural gas then affect the uptake of renewables? If demand comes to raise price down the line, would gas from the Black Sea still be competitive vis-à-vis possible sources of gas imports abroad (assuming what is referred to as the global gas glut persists, and competing prices are comparable to today). Much may depend here also on the exact nature of demand in the country, and how existing renewable and natural gas trajectories are realised going forward. In the abstract, this may de-

press trends in renewable uptake, but there need not be such sensitivity between the two, given both projections of primary energy demand and the long-term commitment to renewables that Turkey seems to have gone for, both in the name of energy security and economic concerns. In times of suppressed oil and natural gas prices, there emerges an incentive for Turkey to stock resources, pending infrastructural limits in storage capacity. However, any effort to reduce exposure to price volatility in such commodity markets would be yet further reason to invest in renewables, or at the very least optionality and the diversification of supply. A recent article from the [World Economic Forum](#) posits that wind and solar in Turkey now accounts for 13% of the country's electricity generation. Solar, in particular, makes up [6.5%](#) of the country's power generation capacity. Still, lately coal but, more importantly, hydroelectric power has [superseded natural gas use](#) in the country for power generation. Turkey has great potential in the renewable energy sector, and has made a number of large investments in the field over the last decade or so. Turkey is said to rank 13th in the world and 6th in Europe in terms of installed [renewable energy capacity](#), with a figure of [45,000 MW](#) that constituted nearly half of total installed power capacity in the country by the end of 2019. In terms of [geothermal](#), Turkey is one of the 1GW plus capacity club members, with an installed [power generation capacity](#) of around 1,526 MW. There will also be a limit to how many hydroelectric facilities can be built, and there is plenty of room for further offshore wind and solar investment. If current trends are any indication, the emphasis on renewable energy will continue. The government's Vision 2023 policy aims to increase the total installed capacity of renewable energy resource supply to [30%](#) by the centenary of the Republic. How hydrogen may come to feature in the Turkish energy mix is also a question that is now being asked, with the possibility of blending hydrogen and natural gas. There is a moving aim to replace [6% of fossil fuel use with hydro-gen](#). The idea is to use what is termed surplus electricity to power the process of hydrolysis.

Concluding Remarks

The weight of critical introspection on the discovery, fair or otherwise, should not overshadow the fact that Turkey has discovered natural gas in the Black Sea, and that for a country that has had to be so highly dependent on external imports, any development that helps to alleviate such a condition is good. There is of course a process, and a litany of moving pieces need to come together to ensure that the gas is brought to market in a competitive fashion. Further discoveries to be had in the Black Sea will condition the economic case all the more, as well as the interplay between domestic demand and the nature of global energy supply.

⁵ For further reference, the IEA's Key World Energy Statistics 2020 just released provides some useful context on energy prices in select OECD countries.