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King Abdullah Petroleum Studies and Research Center

Commentary

Azerbaijan

Energy, Carbon, and Opportunities

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Abstract

At the end of 2023, after prolonged discussions, Azerbaijan was selected as the host country of the 2024 United Nations climate summit, COP29. Like the two preceding hosts of COP28 and COP27, the United Arab Emirates (UAE) and Egypt, Azerbaijan is also a major oil and gas producer. Soon after winning the bid, Azerbaijani officials started promoting the country's natural gas reserves as a solution to ensuring the global energy transition (Dickie 2023). Indeed, Azerbaijan possesses 2.5 trillion cubic meters of proven gas reserves, slightly more than the reserves of major global gas exporters such as Algeria and Australia (2.3 and 2.4 trillion cubic meters, respectively) (BP 2022). Since the beginning of the Russia-Ukraine conflict, European countries have come to regard Azerbaijan as one of the most suitable alternative suppliers to replace imports of Russian pipeline gas. In June 2022, Azerbaijan and the European Commission signed a memorandum of understanding (MoU) to double the country's exports to Europe by 2027.

Azerbaijan takes a pragmatic approach to its climate policy. Several years ago, it renewed the 'Contract of the Century' (BBC 2017) – a 25-year oil production sharing agreement with a consortium of international investors which concluded in 1994 – until 2050. Azerbaijan has yet to commit to net-zero emissions by mid-century (Climate Action Tracker 2023), as some other countries have. Instead, after revising its Nationally Determined Contribution (NDC) in 2023, the country just increased its target of reducing emissions slightly to 40% by 2050 compared to 1990 levels (ClimateWatch 2024). This target seems less challenging if we remember that, like its close neighbor Russia, Azerbaijan experienced a substantial drop in its emissions in the 1990s after the collapse of the Soviet Union, mainly due to the decline of heavy industry and economic recession (Mikayilov, Galeotti, and Hasanov 2018; Sergeeva and Hatipoglu 2022).

This commentary offers a detailed overview of the Azerbaijani energy sector (mainly upstream and foreign trade) and the opportunities for cooperation with the Kingdom of Saudi Arabia.

Introduction

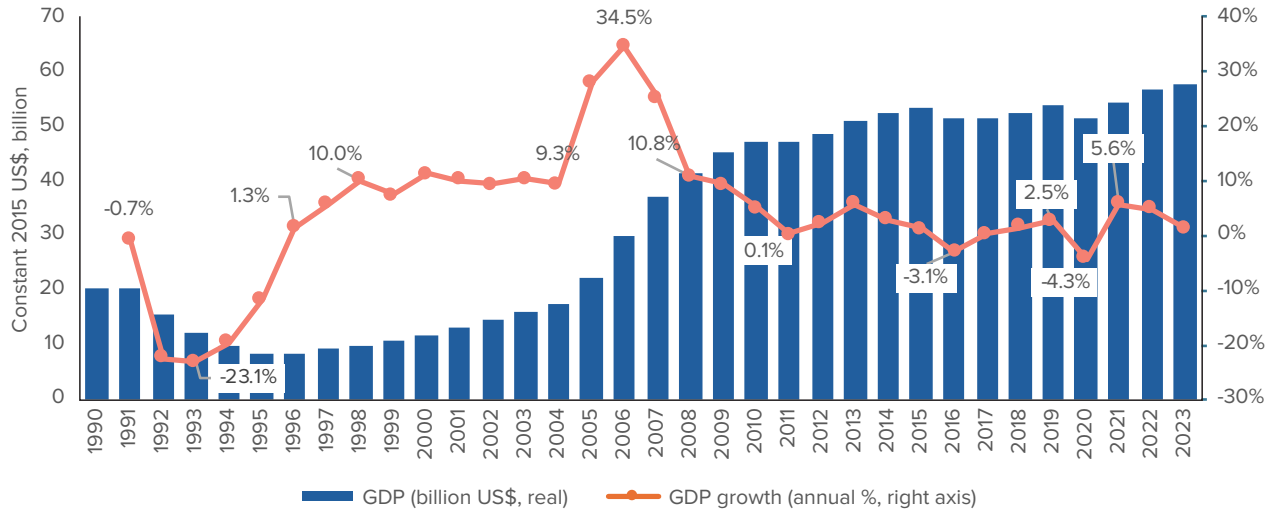
The primary characteristic that could be used to describe Azerbaijan's economy is "heavily reliant on hydrocarbon exports" (IEA 2023). In 2023, oil and gas contributed to 91% of the country's export revenues, or $31 billion; 47%, or $16.2 billion, came from crude exports; 40%, or $13.6 billion, came from the export of natural gas, and the rest was from the export of various oil products (TrendEconomy 2024). These values are the highest among the post-Soviet economies (Hasanov et al. 2023). Italy and Türkiye were its main importers, reflecting the importance of its ties with European partners. Russia, its biggest neighbor and long-term partner, still remains the leading exporter of general products to Azerbaijan, even as imports from China grow (TrendEconomy 2024). In previous centuries, Azerbaijan used to be a part of the Russian empire; during Soviet times, Azerbaijan became one of the 15 republics forming the Soviet Union (USSR).

Azerbaijan also relies on its domestic hydrocarbons for primary energy consumption. In 2022, their shares of primary energy consumption were 35.7% (0.25 exajoules) for oil and 62.8% (0.44 exajoules) for natural gas (Energy Institute 2023). Shares of coal, hydropower, and renewable energy were insignificant.

Its primary energy consumption per capita in 2022 was 67.5 gigajoules, comparable to Algeria or Argentina but significantly lower than such energy-exporting countries as Qatar (10.4 times), Saudi Arabia (4.7 times), the United States (U.S.) (4.2 times), Russia (3 times), and Kazakhstan (2.4 times).[1] This indicator is used by some scholars to compare living standards in different countries, especially in developing nations (Mazur 2011). Indeed, Azerbaijan ranks 85th in gross domestic product (GDP) in current U.S. dollars (US$), similar to such countries as Uruguay, Ghana, and Serbia, and 116th in GDP per capita, similar to Peru, Libya and Botswana (World Bank 2024b, 2023b). Its GDP growth reached double digits between 1998 and 2008 before slowing significantly after the global economic crisis in 2008, falling to negative values in 2016, and with an uneven recovery ever since (World Bank 2024c) (Figure 1). Azerbaijan's recent economic slowdown occurred largely due to the fall in global crude prices in 2015-2020. Cuts in public investment and the depreciation of its national currency between 2015 and 2018 drove away investors, which contributed to a further decline in its economic activity (International Monetary Fund 2016; CEIC 2024). The monopolistic structure of its economy (individual subsectors are controlled by a few state-owned monopolies like the State Oil Company of the Republic of Azerbaijan (SOCAR) for oil and gas, Azerenergy for electricity generation and transmission, Azerishiq for electricity distribution and supply, etc.) also creates barriers for potential investors willing to deploy capital into the country (IEA 2023). In addition to these problems, corruption is also mentioned as one of the challenges to attracting international investors (U.S. Department of State 2023).

Recognizing its dependence on hydrocarbons, Azerbaijan follows a very pragmatic approach to climate policy. It is one of the few countries[2] that do not have a net-zero or carbon neutrality goal. Instead, Azerbaijan set a target to cut its greenhouse gas (GHG) emissions by 40% compared to 1990 levels by 2050, conditional on international support (ClimateWatch 2024). In the Energy Transition section, we show that this target, like in some other post-Soviet republics, has already been achieved. Therefore, the country could still increase its GHG emissions in the coming decades while meeting its climate commitments.

Figure 1. Azerbaijan's GDP in billion constant 2015 US$ and real GDP growth in %, 1990-2023.



Source: Authors, based on World Bank (2024a, 2024c)

Azerbaijan's geopolitics is driven by its geography. The country is uniquely positioned in the Caspian region, sharing a coastline along the world's largest lake, the resource-rich Caspian Sea, with Russia, Iran, Kazakhstan, and Turkmenistan. Ironically, Azerbaijan is a landlocked country, which means that its trade logistics and, therefore, economic development require the cooperation of its neighbors. The country shares land borders with Türkiye, Armenia, Georgia, Russia, and Iran. Azerbaijan has an active military conflict with Armenia over the Nagorno-Karabakh region, and Russia and Iran both possess large militaries and are facing Western sanctions. Azerbaijan's relationship with Iran is slowly normalizing after a series of diplomatic conflicts and minor military incidents along their border in recent years (Mammadov 2024). Its relationship with Russia is much stronger, especially since both countries share a common Soviet past and now also need each other's support to deliver oil and natural gas to European markets since 2022. This interdependence has given Azerbaijan some recent leverage over Russia, allowing it to dismiss Russian peacekeepers from the Nagorno-Karabakh region, significantly decreasing Russia's traditional influence over the region. Similarly, Azerbaijan's good relations with Ukraine, and even rumors that it supplies Ukraine with weapons used in its military conflict with Russia, has not resulted in any show of discontent from the Kremlin, perhaps due to its need in recent years to retain any allies it can (Krivosheev 2024).

With this as the backdrop, the primary purpose of this Commentary is to provide deeper insights into Azerbaijan's oil and gas industry and its energy transition/climate policies. The three sections below discuss the current situation and recent developments in Azerbaijan's energy industry. We also provide a special section on Azerbaijan-Saudi Arabia relations and the potential for their further development.

Petroleum Industry

Azerbaijan has been producing oil for over a century. The world's first commercial oil wells were drilled near its capital Baku (then a part of the Russian Empire), as early as 1846 (Craig et al. 2018). Two decades later, the country supplied about 90% of all oil consumed in Europe, and 23 refineries were built around Baku. At the end of the 19th century, three of the world's 10 largest oil fields were located in Azerbaijan.

During Soviet times, when Azerbaijan became one of 15 USSR republics, it remained an important oil producer. In 1940, it provided 71.5% of the USSR's total crude production. During World War II, it became a strategic target – Hitler wanted to seize control of the rich Caucasian oil deposits to supplement his depleting reserves needed for the military (Hellin 1942). The USSR managed to keep control over the Caspian oil reserves, depriving the German military of a critical fuel source and, ultimately, contributing to Germany's defeat in the war.

In the second half of the 20th century, Azerbaijan's role in Soviet crude production decreased, accounting for 39.1% of the total USSR's output in 1950, 12% in 1960, and just 2.4% in 1980. Two main factors contributed to this. First, resource depletion among the onshore fields without new profitable discoveries led to soaring costs of maintaining production. Second, the simultaneous discovery of enormous oil fields in other areas of the Soviet Union – such as western Siberia and Kazakhstan – made Azerbaijan's mature fields relatively less competitive for domestic investment (Bagirov 1996). Only sometime after the collapse of the Soviet Union did Azerbaijan reclaim its status as a major global oil producer.

September 2024 marks the 30-year anniversary of Azerbaijan's first major international energy agreement between it and 13 leading oil companies (AMOCO, BP, McDermott, UNOCAL, SOCAR, LUKOIL, Statoil, Exxon, Turkish Petrol, Pennzoil, Itochu, Remco, Delta) from eight countries (Azerbaijan, the U.S., the United Kingdom, Russia, Türkiye, Norway, Japan, and Saudi Arabia). Known as the 'Contract of the Century' (or, officially, the Production Sharing Agreement on the Joint Development of the Deep Water Reserves of Azeri, Chirag and Guneshli), it became the basis for the independent growth of Azerbaijan's economy – a rare case for a post-Soviet republic (The Ministry of Energy of the Republic of Azerbaijan 2020).

After this bright beginning, over 30 more contracts were signed between Azerbaijan and various international energy companies. The Contract of the Century helped to significantly ramp up the country's oil production, from, on average, 200 thousand barrels per day (kb/d) in 1990-1997 to a peak value of 1 million barrels per day (MMb/d) in 2009.

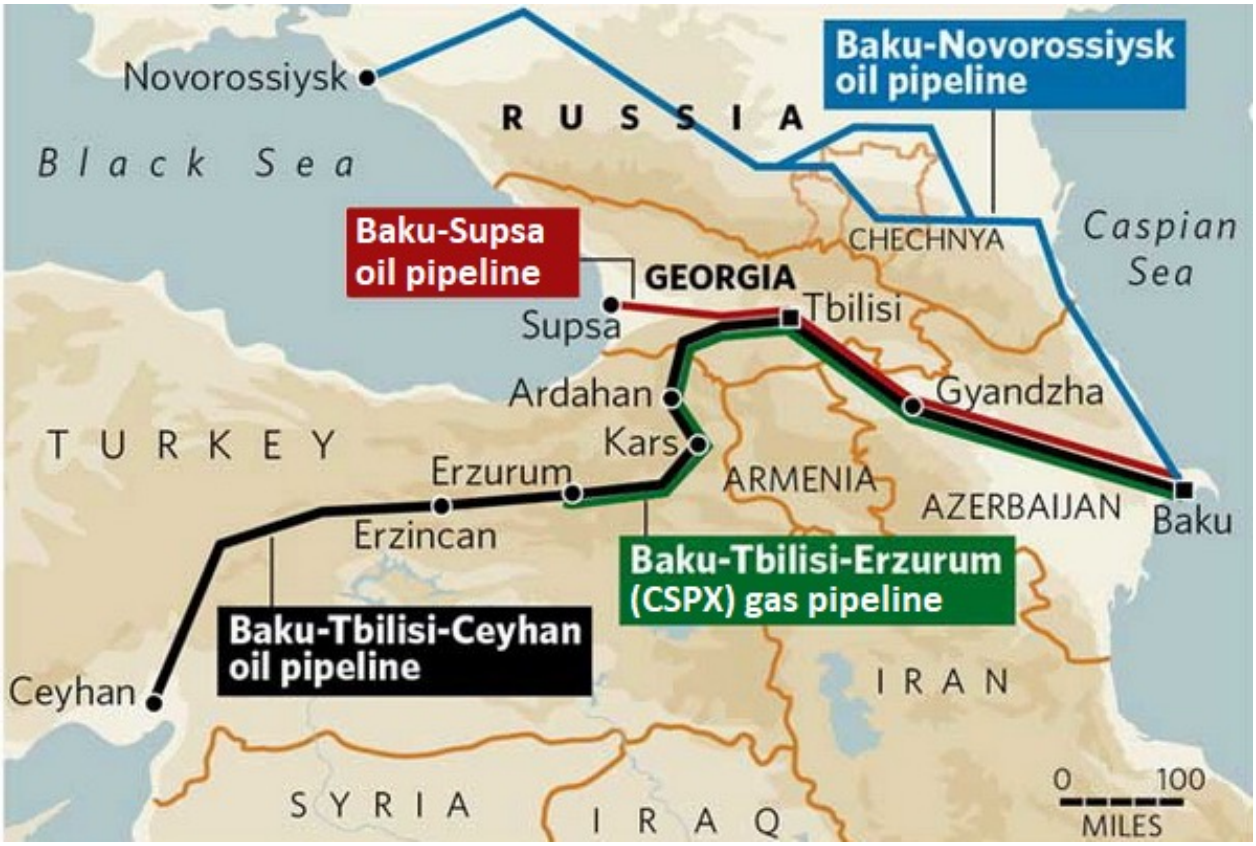
To ensure a stable supply of crude to its customers, Azerbaijan developed three export routes (see Figure 2):

- **The Baku-Novorossiysk pipeline** brings Azerbaijani oil to a Russian seaport on the Black Sea, from where it can be shipped by tanker to global customers. Operational since 1997, its theoretical capacity is 5 million tons (~100 kb/d), but it has not run at full capacity in recent years.

- **The Baku-Supsa pipeline** brings oil to a Georgian seaport on the Black Sea. Its capacity stands at 5 million tons (~100 kb/d). This pipeline has been operational since 1999, but shipments were put on hold in 2022 due to the safety concerns around shipping in the Black Sea in light of the unfolding military conflict between Russia and Ukraine. Recently, Azerbaijan has entered into negotiations with Kazakhstan to relaunch the Baku-Supsa pipeline for the transit of 1 million tons (20 kb/d) of Kazakh oil (Day.az 2024; CCBS 2024).

- **The Baku-Tbilisi-Ceyhan pipeline** passes through Georgia and Türkiye, terminating at a Mediterranean port. This is the leading route for Azeri crude exports, with a capacity exceeding 50 million tons (1 MMb/d).

Figure 2. Export routes of Azerbaijan's crude oil.

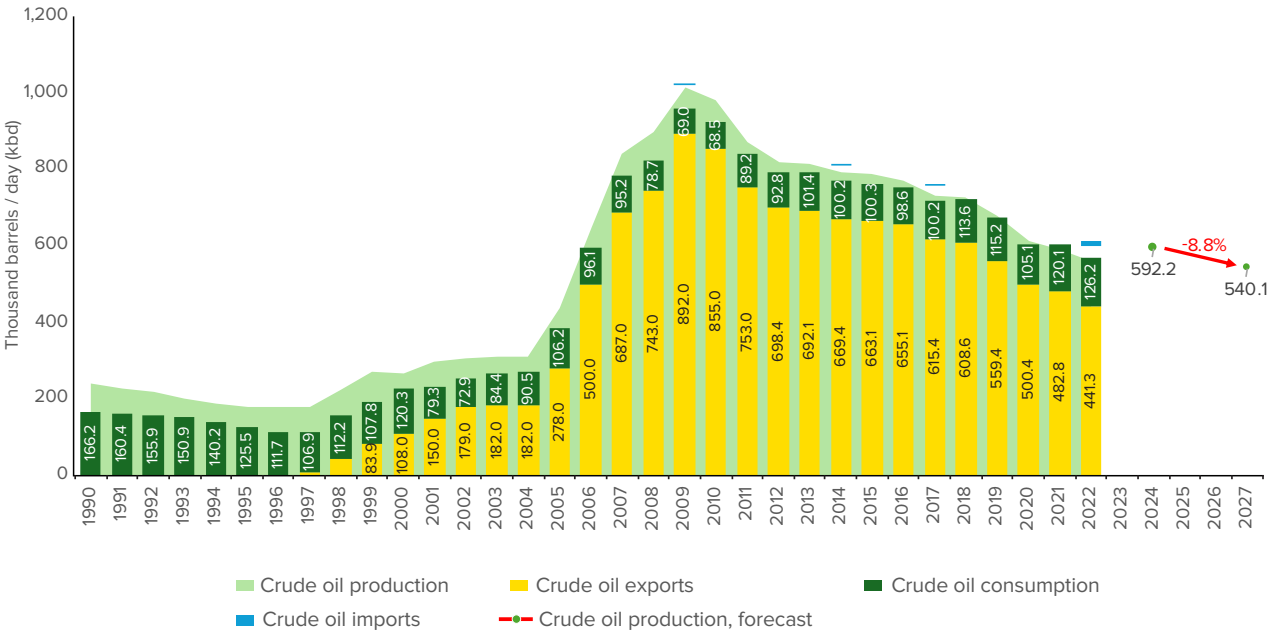


Source: Yevgrashina (2017), edited by the authors.

As can be seen from Figure 3, Azerbaijan's production over the last decade has been declining due to the depletion of reserves in the offshore Azeri-Chirag-Guneshli field block in the Caspian Sea. Despite an expected 100 kb/d increase in production in 2024 due to the commissioning of the new Azeri Central East platform by BP, overall production will likely remain negative. Government forecasts predict an 8.8% decline in production between 2024 and 2027 (Khasanova 2024).

Almost three-quarters (375.55 kb/d out of a total of 523 kb/d) of crude production in 2023 was exported to the European market (see Figure 4). Azerbaijan became a primary crude supplier to Italy and Croatia, but volumes imported by other European countries were insubstantial: In 2023, Azerbaijan was the 10th largest crude exporter by volume to the European Union (EU), significantly lagging behind the U.S. (1.35 MMb/d), Kazakhstan (887.5 kb/d), Saudi Arabia (706.8 kb/d), and others, including Russia (409.6 kb/d) (Kerimov 2024).

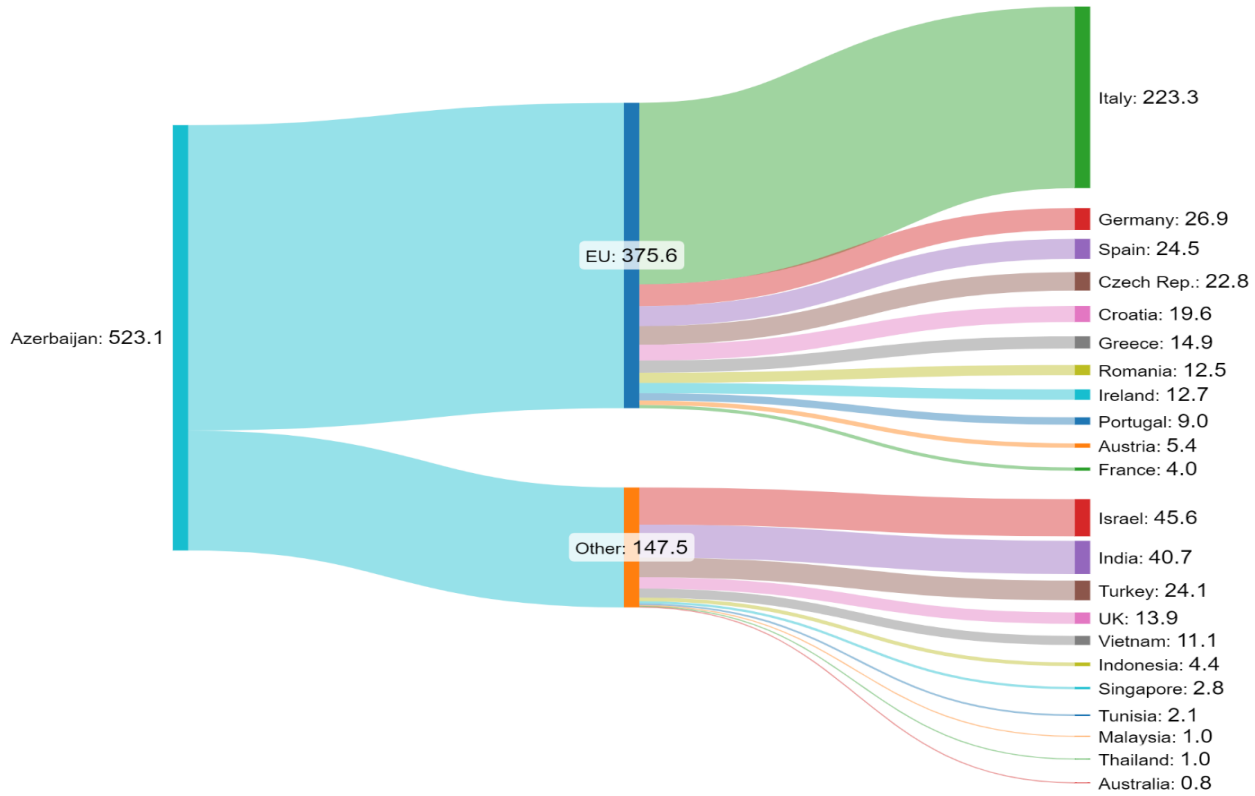
Figure 3. Azerbaijan's crude oil production, consumption and exports in 1990-2022, thousand barrels per day (kb/d).



Note: In 2022, Azerbaijan imported 673.2 kilotons of oil from Russia (Parshinova 2024). In 2023, this amount increased by 2.9 times to 1.918 million tons of oil (Finmarket 2024). Allegedly, the imports are necessary to support its declining domestic production and deliver the planned volumes for export. Azerbaijan procures Russian oil at an attractive discount and uses it internally, while more expensive domestically-produced oil is exported (VERELQ 2024).

Source: Authors, based on CEIC (2023a).

Figure 4. Azerbaijan's crude oil exports by destination, 2023, kb/d.



Source: Authors, based on Abbasova (2024) via sankeymatic.com

In 2017, the Contract of the Century, scheduled to expire in 2024, was extended for 25 more years to 2050. It is expected to attract at least $40 billion in investments. The State Oil Fund of the Republic of Azerbaijan (SOFAZ), the entity responsible for managing the country's oil revenues, plans to receive a one-off bonus of $3.6 billion in payments from foreign investors (BBC 2017; Bagirova and Bousso 2017). This is expected to ease the problem Azerbaijan has faced over the past decade of attracting foreign investors.

Though not an OPEC member, an important part of Azerbaijan's energy policy is its cooperation with OPEC via the OPEC+ format. On December 10, 2016, Azerbaijan signed OPEC's Declaration of Cooperation, demonstrating its alignment with the OPEC alliance. Even though the country has lagged slightly behind its OPEC+ quota this year (by underproducing 75 kb/d in April and 81 kb/d in May), it has helped the group as a whole meet their target (Oil & Gas Journal 2024).

Natural gas

Azerbaijan possesses 2.5 trillion cubic meters of proven gas reserves (or 1.3% of global reserves), which is slightly more than the reserves of major global gas exporters such as Algeria and Australia (2.3 and 2.4 trillion cubic meters, respectively) (BP 2022). The country holds one of the largest gas-condensate fields in the world, Shah Deniz. It is located on the deepwater shelf of the Caspian Sea, with its reserves initially estimated at approximately 1 trillion cubic meters (m3) of gas and 2 billion barrels of condensate. However, one of the main challenges for Azerbaijan was finding a transport route to deliver its gas to potential customers. One of the options considered was transiting through Russia. However, this idea was discarded in favor of the Southern Gas Corridor (SGC) through Georgia and Türkiye. Recognizing the project's importance, the EU provided financial support for the SGC's construction – even though the Azeri natural gas is on the expensive side of available EU import options (Hasanov et al. 2020).

The SGC was completed in 2020 and is fully operational. It comprises four pipelines (see Figure 5):

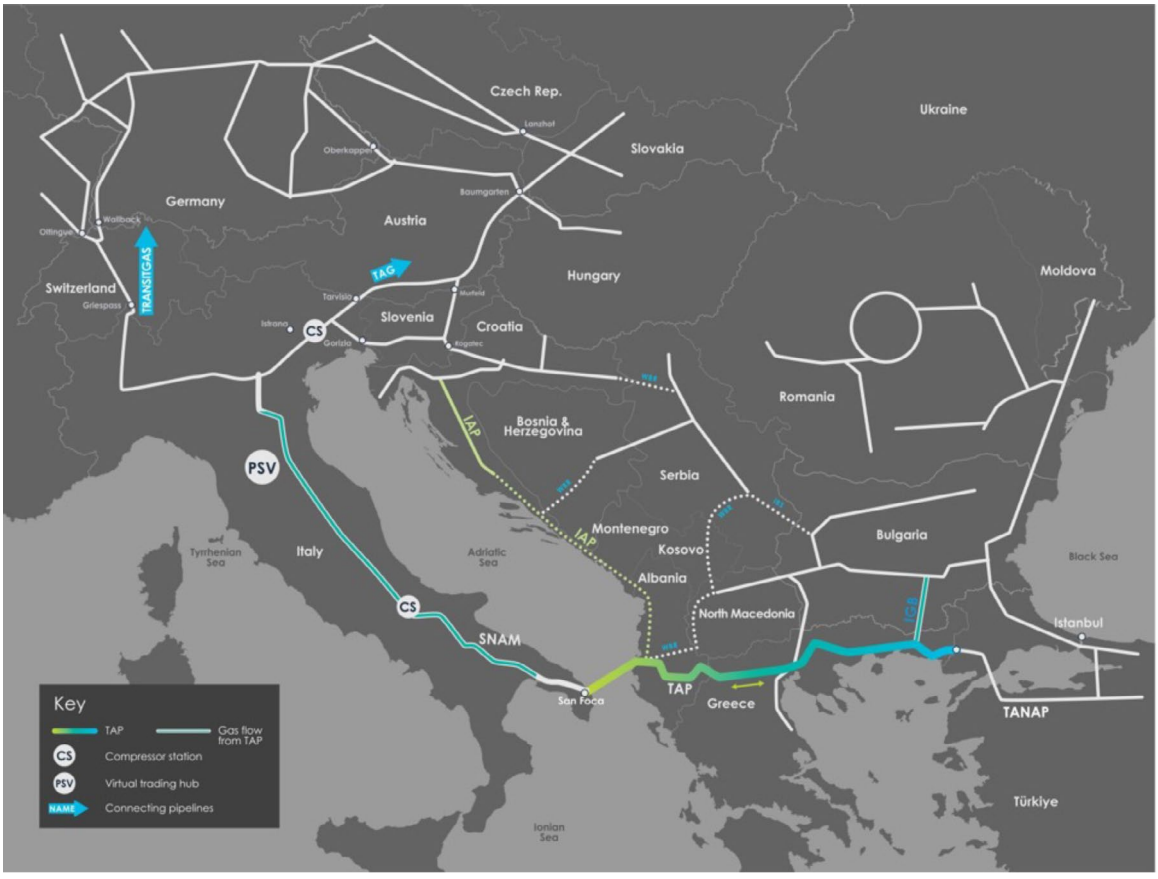
- **The South Caucasus Pipeline (CSPX), also known as the Baku-Tbilisi-Erzurum Pipeline**, from Azerbaijan to Georgia. It had an initial capacity of 7.41 billion cubic meters (bcm) in 2006, which was expanded to 24.04 bcm in 2018. If needed, a further expansion of up to 34 bcm is possible (SGC n.d.).
- **The Trans Anatolian Pipeline (TANAP)** starts in Azerbaijan as an expansion of the CSPX. It follows the CSPX through Georgia and across Türkiye. Its initial capacity was roughly 16 billion cubic meters (bcm). With additional investments, this could be increased to 31 bcm. Currently, 5.7 bcm of Azerbaijan's gas is supplied to Türkiye and approximately 10.5 bcm to Europe (Report News Agency 2024b).
- **The Trans Adriatic Pipeline (TAP)** from the border of Türkiye to Italy across Greece and Albania, with a capacity of 10 bcm (can be increased to 20 bcm).
- **The Gas Interconnector Greece-Bulgaria (ICGB)**, which connects Bulgaria to the TAP. It has a capacity of 3 bcm (which can be increased to 5 bcm) (see Figure 6).

In addition, the TAP has interconnections with multiple existing and proposed pipelines, allowing gas to be supplied to local European markets like Romania, Croatia, Slovenia, etc. (see Figure 6).

Figure 5. Southern gas corridor route.

Source: SGC (2023), edited by the authors.

Figure 6. Interconnections between the TAP and local European gas markets.



Source: TAP (2023).

After the escalation of the Russia-Ukraine conflict in 2022, European officials approached Azerbaijan with requests to increase its exports to substitute for Russian pipeline gas. Indeed, the parties have agreed to double Azeri imports into Europe by 2027 to approximately 20 bcm per annum. However, some experts consider the deal highly questionable for two main reasons – growing domestic demand and challenges with expanding domestic production due to the need for foreign investment and offtake guarantees.

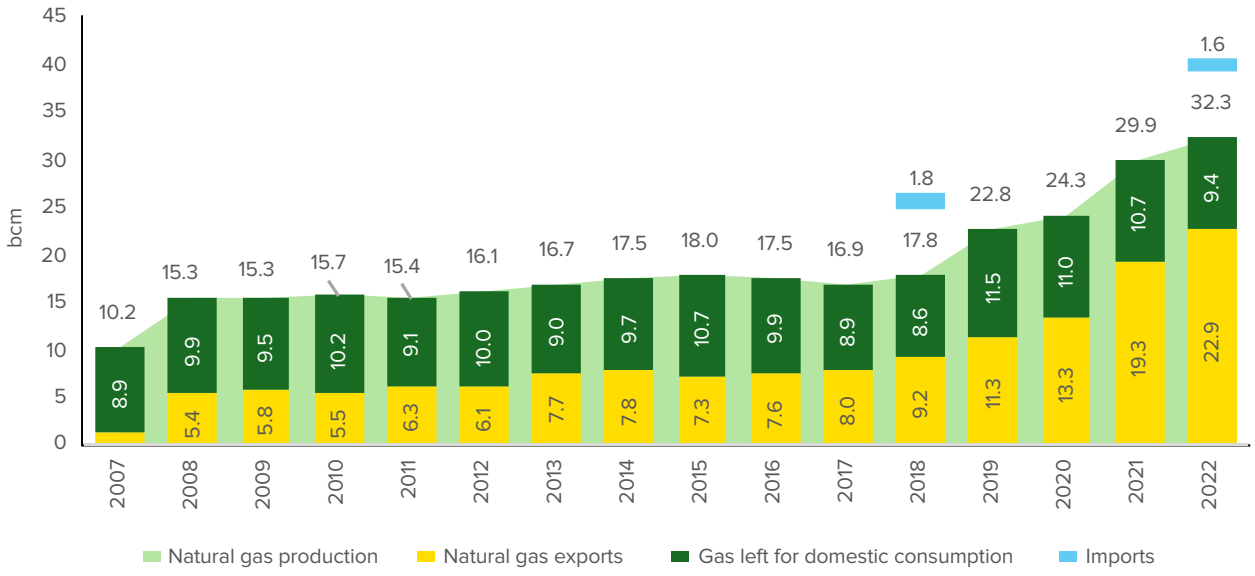
First, the growing domestic Azeri demand for gas could limit the volumes available for export. In the last few years, domestic consumption stood at 10-11 bcm (see Figure 7). In 2022, the volumes not exported were insufficient to cover this demand, pushing Azerbaijan to import a record 1.6 bcm of natural gas, mainly from Turkmenistan, Russia (with which it entered a short-term agreement to import 1 bcm in 2022-2023), and Iran. Official data shows that Azerbaijan only imported natural in 2018 and 2022, as shown in Figure 7. However, non-Azerbaijani sources suggest it has an increasing dependence on Iran, which supplies Azerbaijan with natural gas from Turkmenistan in a trilateral swap agreement.

In the past decades, Iran and Azerbaijan have established bilateral gas swap deals. Prior to 2016, Iran imported 402 million m^3 of gas annually for its East Azerbaijan Province and returned 350 million m^3 (taking roughly 15% of the gas as payment for the transaction) to the Nakhchivan Autonomous Republic, a landlocked Azerbaijani exclave. In recent years, the volumes imported by Azerbaijan started to increase rapidly, and Turkmenistan, Azerbaijan, and Iran signed a trilateral gas swap deal. In 2019, Azerbaijan received 0.6 bcm under the swap scheme, with 0.51 bcm in 2021, 0.86 bcm in 2022, and a record 1.51 bcm in 2023. This deal helps Iran, which transports the gas, to provide energy to its provinces located far from its own national gas resources. However, in early 2024, the trilateral swap agreement was halted due to disagreements on pricing. Azerbaijan and Turkmenistan appear to have now established a bilateral scheme (Fanger 2024).

In 2017-2021, Azerbaijan's domestic gas consumption grew at an average annual rate of 3.5%; a similar rate is observed for 2024 (Economist Intelligence 2023; Report News Agency 2024a). If this growth persists, it could mean that European countries, turning to Azerbaijan to ensure energy security, will instead become energy dependent on two other states – Turkmenistan and Iran, with which political relations are far from easy.

Another potential solution for increasing gas supplies into Europe that Azerbaijan has been discussing with its neighbors is swapping gas with Russia, whose deal to transport its pipeline gas to Europe via Ukraine is about to expire at the end of 2024. Ukrainian officials have been clear that the cessation of the transit contract with Russia is non-negotiable. However, Ukraine is open to a transit agreement with a new supplier (such as Azerbaijan) (Prasad 2024). If the swap agreement between Azerbaijan and Russia worked out, all parties would receive what they want: Russia would maintain demand for the volumes supplied through Ukraine (14.6 bcm physically supplied in 2023); Azerbaijan would get a new route to deliver its gas to European customers; and Ukraine would keep the income it receives from the transit (in accordance with the existing agreement between Russia and Ukraine, Gazprom pays Ukraine for the transit of 40 bcm per year regardless of actual volumes supplied; in 2021-2024, the payments amounted to over $1.2 bln per year)[3] (Ilchenko 2024; Slovo i Delo 2023). However, this potential deal started raising concerns among European officials, who suspected that the scheme might be used to 'rebrand' Russian gas being sent through Ukraine using the Azeri label (Koshiw, Hancock, and Tani 2024).

Figure 7. Natural gas balance in Azerbaijan.



Source: Authors, based on CEIC (2023b) and The State Statistical Committee of the Republic of Azerbaijan (2023).

The second factor that could hinder the ambition of doubling EU gas imports from Azerbaijan by 2027 is Azerbaijan's need for certainty and financial support. As Azerbaijan's President Aliyev has stated, restrictions on financing fossil fuel projects from institutions like the European Investment Bank make finding necessary resources more challenging. Azerbaijan is still paying back the loans it received to build the Southern Gas Corridor and the Shah Deniz Stage 2 project. It is unwilling to spend more money without receiving long-term offtake guarantees from customers so it can recover its costs (Dovgal 2024).

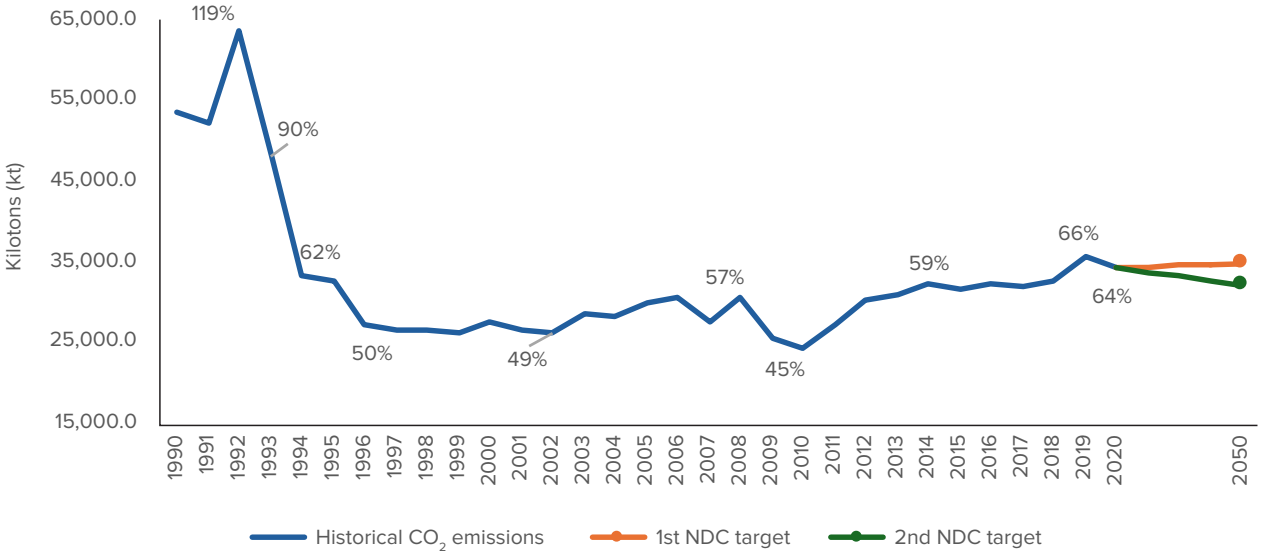
Energy Transition

Azerbaijan's energy transition policy over the past decade can hardly be called ambitious. The country submitted its first and second (updated) nationally determined contributions (NDCs) under the Paris Agreement. However, it has yet to provide a long-term low-carbon development strategy[4] – the document outlining a country's mid-century low-GHG development strategy – and it has yet to set a net-zero target. According to its updated NDC, Azerbaijan aims to achieve a 40% reduction in its emissions from 1990 levels by 2050, conditional on international support. This represents a modest increase from the 35% reduction target in its initial NDC submitted in 2017.

After the collapse of the Soviet Union, industry in Azerbaijan, like in Russia, experienced a major decline. As a result, the country's GHG emissions halved and are still far under their 1990 levels (Nabiev 2016), even though they have been climbing over the past decade.

As Figure 8 shows, in 2020, Azerbaijan had already reduced its carbon dioxide (CO_2) emissions by 36% below their 1990 levels. This means that, for the 2050 target set in Azerbaijan's second NDC, the country will need to decrease its emissions further by only 73.8 kt CO_2/year (or 0.215% per year).

Figure 8. Azerbaijan's historical and projected CO_2 emissions from its first and second NDCs, kt and %.



Source: Authors, based on Climate Watch (2024) and World Bank (2023a).

Azerbaijan has begun trying to develop its renewable energy sources (RES), stimulated by three primary factors:

- The achievement of its NDC target of at least 30% RES deployment (or 1,500 megawatts of capacity) by 2030 (UN Climate Change 2023).
- Replacing domestic natural gas consumption with renewable electricity will make more volumes of gas available for export.
- The possibility of the direct export of clean energy to European countries.

We discuss each of these factors in turn.

2030 RES target. According to the minister of energy Parviz Shakhbazov's speech at the Voice of the Global South Summit in November 2023, Azerbaijan plans to integrate 1870 megawatts (MW) of 'green' energy into the grid by 2027, bringing the share of RES installed capacity to 33% and electricity generation to 25% (in 2023, it equaled 7% of generation). This means that the target of 30% RES in installed capacity by 2030 will be exceeded (AZERTAC 2023). However, as highlighted by some scholars, introducing RES significantly decreases CO_2 emissions under only two conditions: first, their large-scale deployment (so that their share in total energy consumption is enough to produce the desired effect), and, second, a decrease in the share of fossil fuel energy in favor of renewable energy sources. Therefore, other measures, such as increasing energy efficiency and investing in innovative projects leading to technological progress, can be more beneficial for the economies of energy producing countries (Hasanov, Mukhtarov, and Suleymanov 2023).

Domestic gas consumption replacement. As mentioned above, replacing domestic gas consumption in Azerbaijan is needed to meet the country's export demand and further its economic growth. Increased domestic energy demand could threaten the planned doubling of the country's gas exports to Europe, but replacing some domestic gas consumption with renewable energy could support that plan.

Direct export of clean energy. According to Minister Shakhbazov, Azerbaijan's strategic priorities include energy exports and regional cooperation: "Creation of the Caspian-Black Sea-Europe and Azerbaijan-Turkey-Europe corridors, as well as export of more than 5 GW of 'green' energy through diversified routes, are our strategic priorities. These corridors also promise the possibility of transportation of 'green' energy from Central Asian countries" (Ministry of Energy of Azerbaijan 2024).

The technical potential of Azeri renewable energy sources deployment is quite impressive: 135 GW onshore and 157 GW offshore. However, the economic potential of their deployment is almost 11 times less, at 27 GW. This comprises 3 GW of wind energy, 23 GW of solar energy, 0.38 GW of bioenergy potential, and 0.52 GW of mountain rivers (Ministry of Energy of Azerbaijan 2024).

However, the contribution of low-carbon and renewable energy sources is beneath the desired level for the Azeri energy mix. Azerbaijan's total power generation capacity as of March 2024 was 8320.8 MW, while the capacity of the power plants powered by renewable energy sources was 1687.8 MW (20.3 % of the total capacity). Of this number, 1301.8 MW was from large hydropower plants (HPPs), with only 281.9 MW from solar, 66.4 MW from wind, and 37.7 MW from bioenergy (Ministry of Energy of Azerbaijan 2024). In 2022, renewable energy sources, including hydro, contributed 6% (1.8 TWh) to Azerbaijan's electricity supply (IEA 2023), representing 1.5% of its total primary energy supply. In 2023, the RES share of electricity supply was reported to have increased to 7% (Ministry of Energy of Azerbaijan 2024).

To achieve its 2030 targets, the country recently announced a boost of $2 billion in green investment, which is expected to result in the deployment of almost 2 GW of new RES capacity by 2027, increasing the share of installed renewable capacity to 33% of its energy mix (World Economic Forum 2024). The country hopes that these measures will attract international investors and project developers to deliver on its government's ambitious plans. Indeed, some international companies, including TotalEnergies and BP, have demonstrated interest in developing Azerbaijan's renewable energy potential.[5] Saudi Company ACWA Power is already playing an important role in Azerbaijan by developing the 240 MW Khizi-Absheron wind farm, which will start generating power in 2025. There are two other potential projects for this company in Azerbaijan – the construction of onshore renewable energy facilities with a total capacity of 1 GW, a 1.5 GW offshore wind farm, coming together with a battery storage facility. There are three other plants with a total capacity of 1 GW: the 445-MW Bilasuvar solar facility, the 315-MW Neftchala solar plant, and the 240-MW Absheron-Garadagh wind farm. These are being developed by Azerbaijan's SOCAR and the United Arab Emirates' (UAE's) Masdar (O'Byrne 2024). In the next section, we explore the cooperation between Azerbaijan and Saudi Arabia in greater detail.

Kingdom of Saudi Arabia (KSA)-Azerbaijan relations

In recent years, bilateral cooperation between Saudi Arabia and Azerbaijan has increased, supported by various agreements and memorandums of understanding (MoUs) between governmental and private entities (Table 1). These were mainly initiated by Saudi entities, often with the aim of achieving goals related to the Kingdom's Vision 2030.

Table 1. Agreements between Azerbaijan and Saudi Arabian entities or companies in the last five years.

Date	Type of Agreement	Signatories	Scope
January 30, 2019	MoU	Ministries of Justice of Saudi Arabia and Azerbaijan	Exchange of expertise, information, and training; organization of meetings and lectures.
March 17, 2019	MoU	Ministry of Energy of Azerbaijan, and ACWA Power of the Kingdom of Saudi Arabia	Cooperation on the use of renewable energy sources. In 2021, ACWA Power invested $300 million to build a 240-MW wind power plant in Azerbaijan that will contribute to 30% of its RES target.
January 9, 2020	Implementation agreements	Ministry of Energy of Azerbaijan, ACWA Power of the Kingdom of Saudi Arabia, and Masdar of the United Arab Emirates	Pilot renewable energy projects.
December 29, 2020	Investment agreement, power purchase agreement, and transmission connection agreements	Ministry of Energy of Azerbaijan, Azerenergy OJSC and ACWA Power of the Kingdom of Saudi Arabia	240 MW wind power plant.
January 13, 2022	MoU	Ministry of Energy of Azerbaijan, and ACWA Power of the Kingdom of Saudi Arabia	Cooperation on offshore wind energy.
May 5, 2022	MoU	Saudi General Bureau for Auditing, and Chamber of Accounts of Azerbaijan	Cooperation on accounting, control and professional work.
September 21, 2022	MoU	Ministry of Human Resources and Social Development of Saudi Arabia, and the Ministry of Labor and Social Protection of the Republic of Azerbaijan	Cooperation on the development of labor market policies, and the exchange of relevant legislative and regulatory documents.

Date	Type of Agreement	Signatories	Scope
January 17, 2023	MoU	Azerbaijan National Agency for Mine Action (ANAMA), and the King Salman Humanitarian Aid and Relief Center (KSrelief) of the Kingdom of Saudi Arabia	Financial support to deactivate and remove mines within the territory of Azerbaijan.
February 3, 2023	MoU	Ministry of Energy of Azerbaijan, and ACWA Power of the Kingdom of Saudi Arabia	Development of battery energy storage systems in the Republic of Azerbaijan
February 3, 2023	Implementation agreement	Ministry of Energy of Azerbaijan, and ACWA Power of the Kingdom of Saudi Arabia	Offshore wind power project with a capacity of up to 1.5 GW in the Republic of Azerbaijan.
November 7, 2023	MoU	State Oil Company of Azerbaijan Republic (SOCAR), Abu Dhabi Future Energy Company (Masdar), and ACWA Power of the Kingdom of Saudi Arabia	Development of 500 MW of renewable energy projects in the Nakhichevan Autonomous Republic of the Republic of Azerbaijan.
November 20, 2023	MoU	Saudi Arabia's Control and Anti-Corruption Authority (Nazaha), and Azerbaijan's Public Prosecution	Combatting corruption and enhancing cooperation in combating cross-border corruption crimes.
January 30, 2024	MoU	The Islamic Development Bank (IsDB), and the Ministry of Economy of the Republic of Azerbaijan	Establishing a collaborative framework for the Country Engagement Framework (CEF) for Azerbaijan during 2024-2026. The CEF has three pillars: 1) green, resilient, and sustainable infrastructure development, including support for reconstruction in the Karabakh region, renewable energy, regional connectivity, and the sustainable production of hydrocarbon resources; 2) private sector development, exports, and innovation in agriculture and the Halal ecosystem; 3) digital transformation, Islamic finance, regional and south-south cooperation, and capacity development.

Source: Authors, based on The Ministry of Energy of the Republic of Azerbaijan (2024a, 2024b), The Islamic Development Bank (2024), ACWA Power (2023), Saudi Press Agency (2022, 2023), Saudi Gazette (2023), Hasanov, Mukhtarov, and Suleymanov (2023), Ministry of Human Resources and Social Development of Saudi Arabia (2022), Argaam (2019).

In May 2024, Saudi Arabia and Azerbaijan issued a joint statement on energy cooperation that highlighted the importance of their ties within the OPEC+ alliance. It also highlighted the importance of enhancing international cooperation on climate action, "allowing each country to chart its own path based on its national circumstances and approaches through a variety of measures that they can contribute to" (Ministry of Energy of Saudi Arabia 2024). The countries also mentioned KSA's successful investment in Azerbaijan's wind power sector and agreed to "strengthen the ongoing cooperation in electricity and renewable energy through exchanging knowledge and experiences in electricity interconnection and developing renewable energy projects in both countries" (Ministry of Energy of Saudi Arabia 2024). The countries also agreed to collaborate on energy efficiency, including energy management systems, and on know-how related to low-emission fuels and technologies, including lower carbon aviation fuels (LCAF) and hydrogen-based synthetic aviation fuel (e-fuel) (Ministry of Energy of Saudi Arabia 2024).

The two countries share common challenges, including remaining competitive energy exporters in an increasingly decarbonizing world. Therefore, there is great potential for cooperation on decarbonization technologies for the oil and gas sector and the advancement of the circular carbon economy. So far, the two countries are yet to cooperate bilaterally on the promising area of carbon capture, utilization, and storage (CCUS), where the Kingdom can offer much expertise. Just recently, Azerbaijan's state energy company SOCAR signed an

MoU with Eni, an Italian multinational energy company, on the areas of energy security, greenhouse gas emissions reduction, and the biofuel production chain. The MoU includes "the evaluation of carbon capture and transportation solutions from existing plants in various industrial sectors, storage, and utilization in deposits in Azerbaijan (CCUS)," (Ministry of Energy of Saudi Arabia 2024), which indicates Azerbaijan's increasing interest in this technology (Eni 2024). Another potential area of cooperation is energy security from the exporter's perspective (achieving demand security and export diversification channels) and cooperation through new alliances like the Brazil, Russia, India, China, and South Africa (BRICS) alliance, which Azerbaijan applied to join in August 2024.

Concluding Remarks

In this Commentary, we have highlighted the most important aspects of Azerbaijan's energy industry and energy policy.

- As a country with a long history of oil production, Azerbaijan is likely to remain one of the leading global crude exporters if it manages to solve its main challenge – attracting foreign investment. Achieving this goal is highly dependent on creating investor confidence. Developing a long-term energy strategy would help it indicate the strategic direction for its energy sector. It would also be beneficial to publish a low-carbon energy strategy that outlines the associated priorities for the coming decade.

- In 2022, Azerbaijan received the unique opportunity to increase its natural gas supplies to the European Union, a highly desirable market. However, its ability to deliver the required volumes also depends on investments from and cooperation with other countries.

- Azerbaijan is following a very pragmatic approach to its energy transition, setting targets that can easily be achieved (or already have been). Although the development of renewable energy sources has attracted more attention from government authorities in recent years, this is still relatively nascent in Azerbaijan. Overreliance on fossil fuels both for domestic electricity generation and for national budget revenues can be a losing strategy long term for Azerbaijan, pushing away potential international customers who are increasingly concerned about the carbon footprint of the products they consume. In this regard, Saudi Arabia and Azerbaijan – both global energy exporters – share similar challenges, and the Kingdom could share its knowledge on its successful decarbonization pathway.

We have also identified the potential for Azerbaijan to develop its relationship with Saudi Arabia. This includes continuing Saudi Arabia's already successful investments in Azerbaijan's wind power, exploring joint opportunities in low-carbon fuels, and developing CCUS technologies – an area where the Kingdom possesses significant expertise. As the host of the upcoming COP, the tension between the push for decarbonization and the pull of existing industry will be evident. However, the opportunities for collaboration and investment will be very difficult to ignore. Depending on the deals on the table, Azerbaijan can become a major contributor to the energy transition in Central Asia and the Caspian region, an area that has lagged behind some of the more advanced economies to date.

Endnotes

[1] Moreover, the data quality itself was given the rating of "D – Poor" (World Economics Research 2023).

[2] As of November 2023, around 145 countries had announced or are considering net-zero targets, covering close to 90% of global emissions (Climate Action Tracker 2023).

[3] In accordance with the existing agreement between Russia and Ukraine, Gazprom pays Ukraine for the transit of 40 bcm per year, regardless of the actual volumes supplied. In 2021-2024, the payments amounted to over $1.2 billion per year.

[4] Azerbaijan is also lacking a general long-term energy strategy covering the development of all its energy sectors.

[5] In June 2023, TotalEnergies signed an MoU to develop wind, solar, and energy storage projects for Azerbaijan's national grid, with a total capacity of 500 MW. BP expects to make a final investment decision (FID) by the end of 2024 regarding the $200 million Shafag solar plant with a capacity of 240 MW (Szymczak 2024).

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About the Project

Most research into the future of oil and gas markets utilizes economic approaches that focus on well-functioning markets that are not disrupted by political phenomena. In reality, politically driven events play a significant role in market volatility and market behavior, but there is little systematic, rigorous work that can address the relationship with precision.

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