



# Caspian contributions to energy security in Europe

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## Introduction

Amid Russia's all-out invasion of Ukraine and weaponization of natural gas exports to Europe, the continent has successfully increased its non-Russian imports of fossil fuels and expanded renewable energy to improve its overall energy security. A crucial part of this strategy has been increasing liquefied natural gas (LNG) supplies from non-Russian producers, including the United States, Norway, and Qatar, but the need for diversified energy supplies continues. New gas developments in closer proximity from the Black and Caspian Seas have the potential to help Europe meet its demand for natural gas—in Southeast and Central Europe in particular—as it further reduces reliance on Russian energy. The Caspian holds the greatest potential for ramping up exports on the shortest timeline, but whether the region will actualize its planned developments remains uncertain.

Three countries with Caspian coastlines—Azerbaijan, Kazakhstan, and Turkmenistan—possess considerable energy resources, already export oil and gas to European and Mediterranean markets, and, to varying degrees, are working toward expanding their contributions. Azerbaijan is making strenuous efforts to increase its gas exports to Europe as quickly as possible. There are also prospects for a limited increase in oil exports from Kazakhstan via Azerbaijan, and for Turkmenistan to contribute to Europe's gas balance in the near term.

Despite the Caspian countries' potential to help bolster European energy security, economic and geopolitical factors could hinder the rapid production and export of additional supplies from the region. Raising finance for oil and gas production and transportation has become difficult, as international financial institutions (IFIs) seek to limit financing for fossil fuel projects and the European Commission increases energy transition investments in renewables and green hydrogen.

Moreover, while proposals on both sides of the Caspian for large-scale hydrogen export projects targeted at European markets are ambitious, the complexity of delivery means they may take years to mature. Azerbaijani and Georgian proposals for large-scale, renewables-generated electricity exports to the EU are technically simpler to deliver, and these are now the focus of steady attention.

Meanwhile, it remains unclear whether Azerbaijan's military actions in Nagorno-Karabakh in September 2023 will impact European willingness to increase energy reliance on Azerbaijan.

Europe's need for energy imports, particularly for new sources of gas to compensate for the termination of the bulk of gas supplies from Russia, means there is a premium on the ability to increase gas imports from diverse suppliers quickly. Caspian producers have the potential to meet this need on the timeline required if they act on stated plans to increase natural gas production and tap domestic renewable energy sources.

This issue brief examines the potential for new fossil fuel developments in the Caspian region—and their inherent challenges—to meet Europe's energy needs. It also examines the regional factors in Southeast Europe, including gas flows, infrastructure changes, and market demand, which would affect these supplies' availability in Europe.

## Caspian fossil fuel supplies

The potential market for Caspian energy in Europe has grown considerably as a result of improved connectivity within Europe. Markets in Central Europe—notably Hungary and, potentially, even Ukraine—are now within commercial, if not physical, reach. Direct Caspian deliveries to markets in Southeast Europe remain largely dependent on the Southern Gas Corridor (SGC), the pipeline system that connects Azerbaijan to Italy via Georgia, Turkey, Greece, and Albania.

The approaches of three Caspian energy producers—Azerbaijan, Turkmenistan, and Kazakhstan—to developing resources and increasing exports to Europe vary and depend heavily on multiple factors, including project complexity and financing. To expand exports further, Azerbaijan would need to increase gas production from new or existing fields, or reduce its own gas consumption in order to boost overseas sales. From a technical standpoint, Turkmenistan could also contribute extra supplies that might improve Europe's gas balance in the next year or so, but it is far from certain that it will do so. Kazakhstan is

exploring options for increasing its oil exports to Europe and developing a more reliable transport system, but the uncertainty around timeline and, ultimately, necessity could indefinitely table these discussions.

## Azerbaijan: plans and prospects to 2028

Azerbaijan's oil production is slowly falling from natural depletion of the Azeri-Chirag-Gunashli (ACG) field, so the key issue for both Azerbaijan and prospective European customers is the country's ability to increase gas production and exports to compensate. In the next three to five years, there is a real prospect for a steady increase in gas deliveries from Azerbaijan, and these constitute perhaps the most important new element in the energy relationship between the Caspian producers and Europe.

On July 18, 2022, Azerbaijan and the European Union signed a memorandum of understanding (MoU) under which Azerbaijan agreed to double the supply of gas to the European Union, together with an expansion of the SGC. This is generally taken to mean that Azerbaijan would increase deliveries to Europe to around 20 billion cubic meters annually (bcma) by 2027.<sup>1</sup> In practice, it means an increase of around 8 bcma over estimated 2023 deliveries of around 12 bcma.

At the same time, Azerbaijan needs to ensure it can meet its own increasing demands for gas. In 2023, while exporting some 23.8 bcm of gas, it also imported 2.3 bcm. Most of this came from Turkmenistan, which provided 1.5 bcm via swap arrangements with Iran.

It is worth noting that Russia also provided 0.8 bcm, raising issues concerning transparency in regional gas transport. Azerbaijan's internal gas-distribution system means that technically it might be possible for Russian molecules to enter the SGC system.

In practice, Russia would have difficulty carrying this out. Such a plan would require complex technical arrangements, as well as the approval of the international companies—notably BP—that own and operate the SGC system. In addition, it is not in Azerbaijan's interest to upset its Western customers by feeding them a miniscule volume of Russian gas and therefore jeopardizing its own

<sup>1</sup> At the time that European Commission President Ursula von der Leyen and Azerbaijani President Ilham Aliyev said in the MoU that they would “double the supply of gas from Azerbaijan to the European Union,” Azerbaijan was already supplying the EU at a rate of considerably more than 10 bcma; indeed, such deliveries eventually amounted to around 11.5 bcm in 2022. These were delivered through the Trans-Adriatic Pipeline (TAP), the third stage of the SGC, which was designed to carry 10 bcma and, with the addition of new pipeline compressors, to be expanded to 20 bcma. In practice, however, and without any additional compressors, TAP was carrying gas at a rate of just over 12 bcma in 2023. The assumption, therefore, is that “doubling” relates to Azerbaijan's pre-crisis commitments, yielding a new target of 20 bcma of Azerbaijani gas exports to the EU in or around 2027. The two presidents specifically spoke of expanding the SGC's capacity—by which, in effect, they meant the TAP—to 20 billion cubic metres in a few years.”

substantial gas exports, which now rival its oil exports as a revenue source. In 2022, for example, Azerbaijan exported \$19.5 billion worth of crude oil, while gas exports amounted to \$15 billion. Moreover, for the Russians to try to put together a scheme to send a handful of bcm into Europe via the SGC would seem a diversion of management, technical, and financial resources, when the much larger strategy is to send tens of bcm to China through construction of the Power of Siberia 2 pipeline.

Aside from assuring Russian gas will not taint supplies, for Baku to deliver on the MoU to double its gas supply, Azerbaijan and the European Union now face what is perhaps their toughest test: how to accelerate development of highly complex gas production projects in an era of limited access to international funding for fossil fuel development.

Officials at the State Oil Company of the Republic of Azerbaijan (SOCAR), Azerbaijan's state-owned energy giant, have said they are looking to four fields in particular to boost input into an expanded SGC. These are Umid-Babek, Absheron, the deep-level gas formation under the ACG oilfield, and the existing giant gas field, Shah Deniz.

### Umid-Babek

Babek is generally regarded as a geologically challenging extension of the Umid field, where SOCAR is currently producing around 2 bcma for domestic use. A single company, Umid-Babek Exploration and Production, is the operator. SOCAR holds an 80-percent stake, while the other 20 percent is held by Nobel Oil, a small locally connected company. SOCAR has had plans in place for some time for a second platform intended to raise output to 4.3 bcma, which is estimated to cost \$1.3 billion. However, it has yet to secure the all-important final investment decision (FID), the act that demonstrates that a project can advance because it has the sales commitments necessary to justify financing the project.

More recently, SOCAR officials have, fairly consistently, referred simply to Babek, where an exploration well was drilled in 2022. SOCAR's focus on this section of the field complex may reflect the fact that output at Umid is about to plateau, with more than one-quarter of its estimated resources already produced. The bottom line is that Umid-Babek should be able to produce an extra 2 bcma or so by 2027, but this requires an FID and, given Babek's geological complexity, may require the participation of another international company with specialist expertise.

### Absheron

This field came online in early July 2023 and is currently understood to be producing at a rate of 1.5 bcma, with output entirely dedicated to domestic use. For some years, SOCAR negotiated with France's Total—which has a production-sharing agreement (PSA) for Absheron—for full field development expected to add a further 3 bcma to output, all of which would be dedicated to exports.

In mid-2023, there were two major developments on this front. First, the Abu Dhabi National Oil Company (ADNOC), purchased a 30-percent stake in Absheron, with Total and SOCAR each reducing their shares from 50 to 35 percent. Then, on September 1, 2023, Total announced a program for full-field development to take production to 5.5 bcma, a 4-bcma increase, although no date was given for this target.

### ACG Deep gas

Deep-level ACG gas, lying below the existing Azeri-Chirag-Guneshli oilfield complex, constitutes a significant new resource for Azerbaijan. It is governed by a separate agreement from the original PSA concluded for development of oil at ACG in 1994.

BP, the ACG oilfield operator, drilled its first appraisal well in ACG Deep in 2023, and confirmed the presence of gas reserves in January 2024. According to BP, it is conducting additional data analysis. The company has also stated that it is planning to drill the first well for deep-gas production in 2024.<sup>2</sup>

SOCAR is BP's biggest partner in the project. In extensive discussions in late 2023, the Azerbaijanis expressed eagerness to settle both the technical requirements for full-field development and the key commercial and financial elements necessary to secure an FID in 2024.

At present, however, there is no clarity on the speed and scale of field development because the evaluation of the initial well remains incomplete. Previous assessments have found that the gas is highly pressurized, indicating that development is likely to prove both complex and expensive. This also has implications for financing. Nonetheless, Azerbaijan's president, Ilham Aliyev, declared on March 1, 2024, that ACG gas production would start in the first quarter of 2025.

2 Abbas Ganbay, "BP Announces Plans to Produce Deep Gas from ACG Block," Azernews, January 11, 2024, [https://www.azernews.az/oil\\_and\\_gas/220225.html](https://www.azernews.az/oil_and_gas/220225.html).

## Shah Deniz

Shah Deniz is the backbone of Azerbaijan's gas industry, with its first two phases currently stated to have a production capacity of 27 bcma. However, the field produced 7 bcm in the first quarter of 2023, indicating that the estimated capacity might be a modest underestimate. While the bulk of Shah Deniz output is geared for export, some is used for injection into the ACG oilfield to bolster crude-oil production.

To increase export volumes significantly, a new phase is required. In January 2023, BP, the field's operator, drilled a new exploration well on the flank of the existing field and found gas reserves matching the levels found in existing production areas. The flank program progressed with production from five wells starting on February 13, 2024. SOCAR views the project as the precursor to further development.

No consensus has yet emerged on the likely course of development between the Shah Deniz partners, including Lukoil, Turkish Petroleum, and National Iranian Oil Company (NIOC), as well as BP and SOCAR. SOCAR, however, has expressed optimism that progress will be rapid. In 2023, it anticipated a quick FID for one of the development phases, and additional FIDs for two more in 2025.<sup>3</sup> In June 2024, BP stated that the field had reached plateau production and declined substantive comment about what might happen next.<sup>4</sup>

## From prospect to production

The exploration wells at both ACG Deep and Shah Deniz will likely become production wells, enabling both fields to start production swiftly. However, reaching full production—an estimated 4 bcma from ACG Deep and 5 bcma from Shah Deniz—will take additional time. BP and SOCAR first need to evaluate the exploration wells for the expected speed and volume of future production.<sup>5</sup> Much the same applies to Babek.

What all four projects have in common are financing challenges. The need to combat climate change has prompted IFIs to end most of their lending for projects involving fossil fuels. For Europe to benefit from Caspian energy, the European Commission must persuade institutions such as the European Investment Bank

(EIB) and the European Bank for Reconstruction and Development (EBRD) that Europe's energy needs require a resumption of fossil fuel lending in view of the exceptional circumstances caused by Russia's invasion of Ukraine and the consequent loss of Russian gas supplies to most of Europe.

Since the European Commission has, correctly, stressed Azerbaijan's long history as a reliable energy supplier to Europe—and, indeed, to a wider world beyond Europe—it would normally be expected to back a fresh round of financing for projects relating to increased Azerbaijani gas exports. However, the exodus of almost all the ethnic Armenians from Nagorno-Karabakh in the wake of Azerbaijan's military actions in September 2023 and its blockade of the Lachin Corridor that summer call into question whether Baku will continue to be considered a suitable supplier for additional fossil fuel supplies.

The Parliamentary Assembly of the Council of Europe (PACE), discussing the events in Nagorno-Karabakh on 12 October, 2023, noted "allegations and reasonable suspicion that this can amount to ethnic cleansing" and called on Baku to "create a climate of trust and the material conditions" for Armenians to return to their homes.<sup>6</sup> If financing for SGC expansion and increased Azerbaijani gas production move forward, it is possible that lobbying against such funding will intensify. On the other hand, it is also possible that current US-backed—and increasingly bilateral—efforts to negotiate a final peace agreement between Azerbaijan and Armenia will bear fruit, in which case Azerbaijan might become a significant energy supplier to Armenia in its own right.

Meanwhile, Baku remains optimistic that expansion will proceed smoothly. On February 29, 2024, following talks between Energy Minister Parviz Shahbazov and Trans Adriatic Pipeline (TAP) Managing Director Luca Schieppati, Azerbaijan's Energy Ministry said an initial 1.2-bcma expansion would be ready for use by the end of 2025, with 1.0 bcm destined for Italy and 200 million cubic meters (mcm) set to be delivered to Albania.

3 Interview with a senior SOCAR official, Baku, July 2023.

4 "Azerbaijan Expects 2024 Gas Exports at 24.3 Bcm," Platts European Gas Daily, June 5, 2024.

5 Interview with a senior SOCAR official.

6 "PACE Calls on Azerbaijan to Facilitate Return of Armenians to Karabakh," HETQ, October 13, 2023, <https://hetq.am/en/article/161166>.

Nevertheless, gas producers face a dilemma. To justify the billions of dollars in investment required to develop new resources, they need assurances from Europe that it will be a reliable long-term customer.<sup>7</sup>

### A need for greater connectivity

Beyond an increase in gas production, additional infrastructure development in Southeast and Central Europe is needed to enable the next generation of Azerbaijani gas to reach prospective customers looking to import gas from Azerbaijan. Toward this end, SOCAR is exploring the expansion of the gas-distribution system in Albania, possibly with a view to serving Albania's neighbors, notably Kosovo and Montenegro. Azerbaijan has already boosted supplies to Bulgaria and initiated deliveries to Romania. Hungary, Serbia, and Slovakia are also potential new markets for Caspian gas supplies.

In order to reach such markets, Aliyev has said the SGC pipeline network would need to be expanded. The expansion would include both TAP, which started flowing gas in January 2021 from Turkey's border with Greece to southern Italy, and the Trans-Anatolian Natural Gas Pipeline (TANAP) across Turkey. Additionally, Aliyev called for the Trans-Balkan Line, which used to carry Russian gas southward through Ukraine and Moldova to the Balkans and Turkey, to be reversed so that Azerbaijani gas could head northward.

"If interconnectors in Europe are built on time, then by the end of this year we can start supply to Hungary and to Serbia," Aliyev said.<sup>8</sup> In sum, Aliyev noted, Azerbaijan is currently supplying gas to six European countries and "within one year, if everything goes according to the schedule and (there is) no force majeure, it can be ten."<sup>9</sup> Moreover, if the interconnectors are in place, Azerbaijan could deliver to additional countries in other parts of Europe that have requested Azerbaijani gas. Hungary's own interest in such a development was demonstrated in June 2024 when its state-owned energy company, MVM Group, announced it was purchasing, from Azerbaijan's SOCAR, a 5-percent stake in Shah Deniz as well as a 4-percent stake in the Azerbaijan Gas Supply Company, SOCAR's marketing unit.

### Gas from Turkmenistan

Turkmenistan has several advantages in that it possesses a source of gas that could help ease Europe's energy balance in a matter of months and at relatively low cost. However, the country seems unlikely to move in this direction.

Turkmenistan has the potential to send some 5 bcma of gas from the Magtymguly field operated by Malaysia's Petronas Carigali in the Turkmen sector of the Caspian to existing gas-gathering facilities in the adjoining Azerbaijani sector (please see the Authors' Note at the end of this paper). This would require a forty-eight-mile connector pipeline which, according to SOCAR officials, would cost between \$400–600 million and could be completed within four or five months of getting the go-ahead. What's more, the existing pipeline systems between Azerbaijan and Turkey are understood to have around 4 bcm of spare capacity. Because Turkey has a long-standing agreement to import gas from Turkmenistan, additional Turkmen gas would enable Turkey to reduce its LNG imports, which could instead be delivered to other European customers.

The first half of 2024 appears to indicate that a serious effort to secure transportation of Turkmen gas—at least to Turkey, and perhaps on to Europe—may now be under way. In January, the state-run Turkmengaz signed an MoU with ADNOC to secure the Abu Dhabi company's help in finding new partners to develop Galkynysh, the world's largest onshore gas field, and to deliver Turkmen gas to international markets. Then on March 1, 2024, at a conference in Antalya presided over by Turkish President Recep Tayyip Erdogan and Turkmenistan's de facto leader, the Arkadag (Protector) Gurbanguly Berdimukhammedov, Turkmenistan and Turkey signed an MoU for Turkmen gas to be delivered first to Turkey and then to global markets—in effect, the EU and the Balkans. In April 2024, Turkmenistan sent an energy delegation, led by Murad Archaev, deputy chairman of Turkmengaz, to Brussels to discuss "diversifying Turkmen gas supply routes" as well as methane reduction, renewables development, and energy efficiency.<sup>10</sup> A month later, on May 14, Turkey and Azerbaijan signed an MoU providing for the transit of Turkmen gas to Turkey, almost certainly through use of the SGC system through Azerbaijan and Georgia. "With this exemplary cooperation Turkey and Azerbaijan will

7 International Conference dedicated to the National Leader Heydar Aliyev's Centennial Anniversary, ADA University, Baku, May 3, 2023, author's transcription.

8 Ibid.

9 Ibid.

10 "Turkmenistan-EU Energy Working Group Meets in Brussels," Business Turkmenistan, April 16, 2024, <https://business.com.tm/post/11683/turkmenistaneu-energy-working-group-meets-in-brussels>.

contribute significantly both to our own supply security and Europe's energy supply security," Turkish Energy Minister Alparslan Bayraktar said after signing the May MoU.<sup>11</sup>

However, timing remains an issue. Even though it would only take a few months to implement a firm decision to lay a forty-eight-mile Connector pipeline to carry initial Turkmen gas to Azerbaijan for input into the SGC, time is running out for any such decision to impact European gas balances in the immediate future, in particular to help ameliorate any European gas shortfall during the winter of 2024–2025.

But there does appear to be a sense of realism in current discussions, not least in that they appear to be focused on using existing infrastructure as much as possible, rather than seeking to build a whole new system. In the past, Turkmenistan has pinned its ambitions on exporting as much as 30 bcma to Europe. However, constructing such a system to connect its Caspian export terminal at Turkmenbashi with major European import terminals would cost as much as \$30 billion.

Under current circumstances, with Europe looking to gas as an emergency fuel while seeking to reduce longer-term dependence on gas in order to counter the climate crisis, the European Commission might be supportive of Turkmenistan playing a long-term role in European gas supply if it starts small, builds up its exports steadily, and demonstrates reliability as Azerbaijan has done. This would require Turkmen officials to act quickly, however, to help Europe with its immediate gas supply problem.

### Oil from Kazakhstan

Kazakhstan is suffering from uncertainty concerning the future of its oil exports. The Caspian Pipeline Consortium (CPC) line from Atyrau to the Russian Black Sea port of Novorossiysk remains the country's principal export system, but Kazakh officials note that Russia closed down exports from Novorossiysk on four occasions last year, dubiously citing adverse weather and technical problems. The Kazakhs would therefore like to increase their use of the Baku-Tbilisi-Ceyhan (BTC) pipeline, which has considerable spare capacity since the primary source of its input, Azerbaijan's principal oilfield, Azeri-Chirag-Guneshli, is currently producing at little more than 60 percent of its peak production.

Laying a new pipeline between Kazakhstan and Azerbaijan, however, would be particularly difficult for two reasons. One is technical: it would either need to cross a deep trench between the two countries or make a detour through Turkmenistan's sector of the sea. The other is political: while Kazakhstan, Azerbaijan, and Turkmenistan hold that pipeline links between adjacent countries in the Caspian do not need to secure the approval of other Caspian states, Russia is still likely to argue that common environmental concerns would require any trans-Caspian pipeline to secure the support of all five littoral states. That would mean that Russia and Iran would, in effect, hold a veto over the construction. While this is not a legal requirement, Russia could wield political power to prevent such a line from being built or delay its construction.

This means that oil from major fields in Kazakhstan, such as Tengiz, Karachaganak, and Kashagan, would need to be shipped by tanker across the Caspian. Six existing Kazakh and Azeri tankers could, in theory, carry 100,000 barrels per day (b/d) of crude to the BTC terminal at Sangachal, south of Baku on the Caspian coast. Kazakh sources say such trade will be aided by the construction of the new port of Kuryk, forty-three miles south of Aktau.

A new generation of tankers could further increase these volumes. In July 2023, Azerbaijan's representative of Kolin, a major Turkish construction and engineering group, spoke about the possibility of building a new fleet of tankers in Baku.<sup>12</sup> The fleet could enable 300,000 barrels per day (b/d) to enter the BTC. The first vessels would be available within three years of the project receiving a FID.

### Increased interconnectivity

Important changes in the market landscape in Southeast and Central Europe—now within commercial, if not physical, reach of Caspian gas—in the last few years have enabled the region to reduce its imports of Russian fossil fuel supplies. The most important has been interconnectivity via infrastructure development.

The construction of new pipelines, interconnectors, and LNG facilities has bridged the gaps among this collection of "island" markets once dominated by Russian supply. Many Southeast and Central European countries can now import non-Russian gas and distribute it into the region. Efforts in Greece and Croatia demonstrate this shift.

11 "Turkey, Azerbaijan Agree on Transition Gas from Turkmenistan to Europe," Platts European Gas Daily, May 16, 2024.

12 As told to the author by Kolin representative, Baris Altinparmak, in July 2023 in Baku.

**Greece LNG.** Throughputs at Greece’s single terminal at Revythoussa have soared. In 2018, it handled twenty-four LNG carriers unloading 0.9 bcm; in 2022, it handled seventy-eight LNG carriers unloading 3.4 bcm. Greece’s second LNG terminal at Alexandroupoulos is now built, and received its commissioning LNG cargo in February 2024. Technical problems, reportedly with the pipeline from the floating storage regasification unit (FSRU) to shore, have delayed commercial operations, but it is now expected to begin operating later in summer 2024. Gas is destined to move into both the Greek domestic market and an expanded Greece-Bulgaria interconnector for onward shipment into Bulgaria and other parts of Southeastern Europe. There are plans at various stages of progress for a further four FSRU terminals.

**Croatia LNG.** Capacity at Krk island is 2.9 bcm. In the latest gas year, it shipped 2.5 bcma into the Croatian gas system, accounting for 71 percent of all gas entering the system. Some of this gas was exported to Hungary. Plans are being defined to increase capacity to 6 bcma.

In addition to these regional developments, two cross-border pipelines have been built. TAP, which runs from Turkey’s border with Greece to southern Italy, started operating in January 2021. In 2022, TAP, the westernmost

section of the Southern Gas Corridor, exceeded its nameplate 10-bcm initial capacity by flowing 11.3 bcm, and was slated to carry close to 12 bcm in 2023.

Yet another pipeline, the 20-bcma-capacity Trans-Balkan line, is now available for flows from Turkey and Bulgaria to Romania, Moldova, and Ukraine. This was enabled by Russia’s Turk Stream starting operations in January 2020, which diverted Russian gas away from the Trans-Balkan Pipeline system.

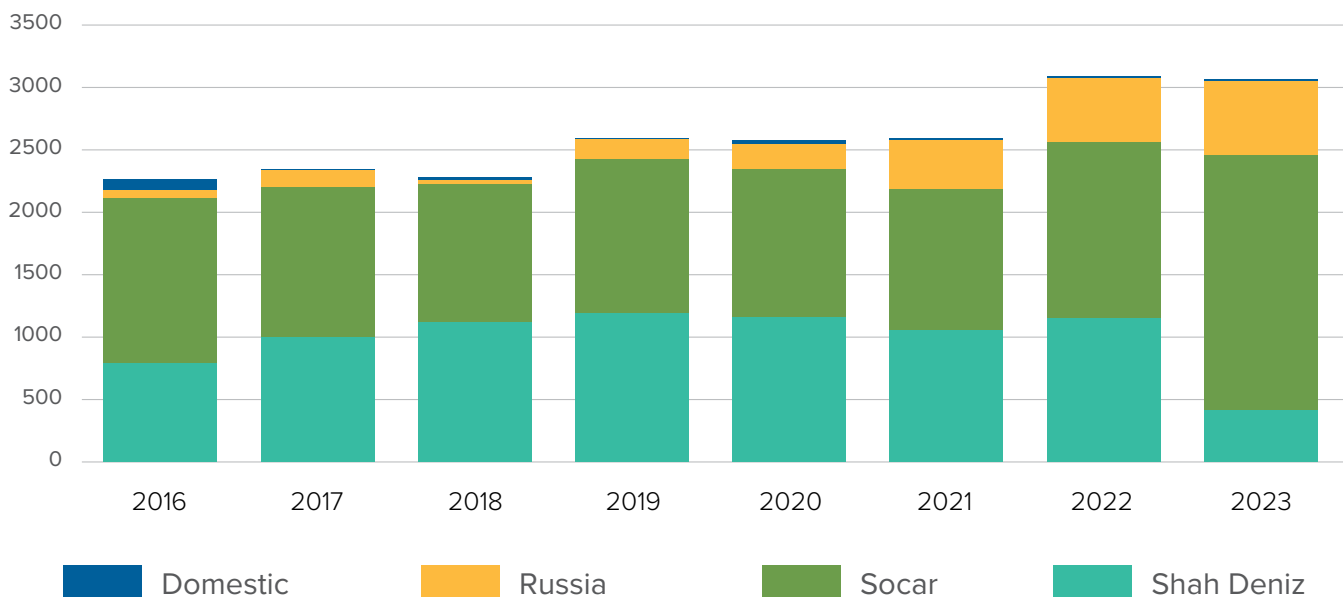
## Regional markets

Four markets stand to directly benefit from Caspian gas supplies via the Southern Gas Corridor and can also serve as conduits of these supplies further north and west. To understand the potential for Caspian supplies to reach Southeast Europe and beyond, an examination of gas demand along the SGC is needed. In order of their accessibility from the Caspian westward, the relevant markets are Georgia, Turkey, Southeast and Central Europe, and Italy.

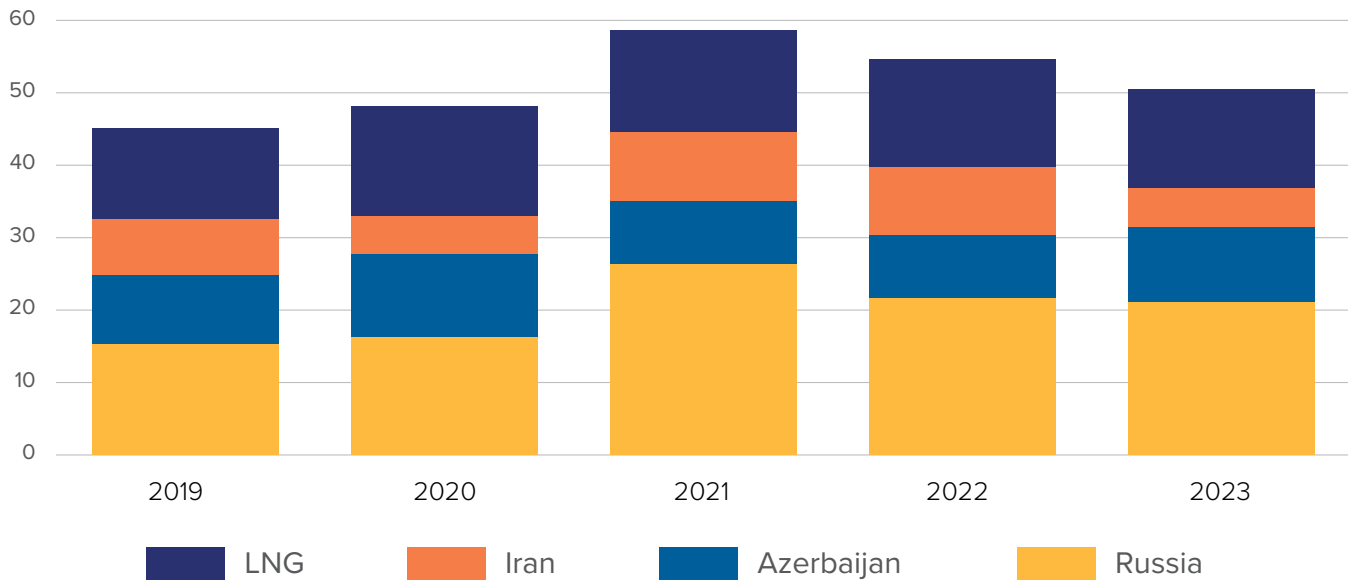
### Georgia

In 2023, Georgian demand remained flat at 3.1 bcm, with 80 percent coming from Azerbaijan. Tbilisi also purchases

**Figure 1 | Georgia gas supply (in mmcm)**



Source: “Activity Report of 2023,” Georgia National Energy and Water Supply Regulatory Commission, 2023, <https://gnerc.org/files/Annual%20Reports/Reports%20English/Annual%20Report.%202023%20ENG.pdf>.

**Figure 2 | Turkey gas imports (in bcm)**

Source: “Doğal Gaz Piyasası Aylık Sektör Raporu, Ocak–Aralık 2023 [Natural Gas Market Monthly Sector Report, January–December 2023],” T.C. Enerji Piyasası Düzenleme Kurumu (EPDK), 2023, <https://www.epdk.gov.tr/Detay/Icerik/3-0-95/aylik-sektor-raporu>.

some gas from the Russian supplies that transit through Georgia to Armenia.

In the medium term, Georgian demand is largely expected to remain in the 3.0–3.5 bcma range. However, Georgian diplomats have spoken privately of the country’s urgent need for a further 2 bcma in imports, potentially reflecting the country’s need for gas as a hydropower backup or concerns that Azerbaijan might have trouble meeting supply commitments.

### Turkey

Turkey is now the fourth-largest gas market in Europe after Germany, the United Kingdom, and Italy. Demand in 2022 was down to 54.6 bcm and to 50.5 bcm in 2023 from record 2021 levels.

Because domestic production is very small—0.4 bcm in 2022 and 0.8 bcm in 2023—demand is nearly entirely met through imports. Russia remains a major source, providing 39 percent of Turkey’s total gas imports in 2022, or 21.6 bcm. That same year, 16 percent of its total imports, or 8.7 bcm, came from Azerbaijan. In 2023, Azerbaijani imports rose to 9.5 bcm.

**Figure 3 | Southeast Europe: demand in main markets 2022 (in bcm)**

	2021	2022	Change
<b>Romania</b>	12.1	10	-18%
<b>Bulgaria</b>	3.4	2.7	-20%
<b>Greece</b>	6.1	4.9	-20%

Sources: “Buletin Statistic de Industrie,” Institutul National de Statistica, January 2019–December 2023. [https://insse.ro/cms/sites/default/files/field/publicatii/buletin\\_statistic\\_de\\_industrie\\_nr11\\_2023\\_0.pdf](https://insse.ro/cms/sites/default/files/field/publicatii/buletin_statistic_de_industrie_nr11_2023_0.pdf); “Energy Balances 2022,” National Statistical Institute, March 13, 2024, <https://nsi.bg/en/content/21186/%D0%BF%D1%83%D0%B1%D0%BB%D0%B8%D0%BA%D0%B0%D1%86%D0%B8%D1%8F/energy-balances-2022>; “DESFA data for natural gas consumption in 2022,” DESFA, Jan. 17, 2023, <https://www.desfa.gr/en/press-center/press-releases/stoixeia-desfa-gia-thn-katanalwsh-fysikoy-aerioy-to-2022>.



**Figure 4 | Italy: gas balance, incremental changes 2021-2022**  
(demand 2021 – 76 bcm; 2022 – 68.5 bcm)

Supply reduction		Demand reduction and increased supply		Italy gas balance in 2022 (bcm)	
Russia (-)	15.1	Demand (-)	7.5	<b>Demand</b>	<b>68.5</b>
Libya (-)	0.6	Pipeline (+)	10.9	Pipeline	58.1
Storage (+)	4.2	LNG (+)	4.6	LNG	14.3
Exports (+)	3.1	-	-	Domestic output	3.3
-	-	-	-	<b>Total supply</b>	<b>75.7</b>
<b>Total</b>	<b>23</b>	<b>Total</b>	<b>23</b>	Exports	4.6
				<b>Pipeline supply from:</b>	
				Algeria	23.6
				Azerbaijan	10.3
				Libya	2.6
				NW Europe	7.6
				Russia	14.0
				<b>Total*</b>	<b>58.1</b>

Note: Total is affected by storage changes and exports.

Sources: “Gas Naturale: Bilancio [Natural Gas: Balance] Tables January 2021–December 2022,” Ministero dell’Ambiente e della Sicurezza Energetica [Ministry of Environment and Energy Security], March 2024, <https://sisen.mase.gov.it/dgsaie/bilancio-gas-naturale>.

### Southeast and Central Europe

Aggregate demand in this region was 27.2 bcm in 2020, supplied by regional production of 10.4 bcm (mostly Romanian) and 10.4 bcm of Russian imports, with LNG into Greece and other pipeline gas into Croatia and Slovenia accounting for the rest.<sup>13</sup> Today, demand has fallen from 2020 levels and is a little over 21 bcm. The region was hit particularly hard by the very high prices of 2022, with demand in main markets falling 20 percent. It is worth noting, however, that Bulgaria’s supply shifted in 2022 from being all Russian to practically all being imported via Greece—a remarkable transformation in such a short period of time.

### Italy

Italy is the third-largest market in Europe after Germany and the United Kingdom. Domestic production is small at around 3 bcma, covering 5 percent of demand. For

many years, Russia has been the main source of imports. In 2022, Italy lost some 15 bcm of Russian gas, but it compensated for this with a mix of more pipeline gas, more LNG, and a 10-percent demand reduction. The details of how Italy rebalanced in 2022 are illustrated in the table above. Italy also managed to increase its gas-storage levels in 2022.

The share of Azerbaijan in the Italian supply mix rose impressively from zero in 2020 to more than 10 bcm (14 percent of supply) in 2022, due to the completion of the TAP in 2021.

Italy has flexibility in its choices because of multiple pipeline and LNG suppliers. This gives it the ability (subject to any contract limitations) to maneuver between various suppliers and accommodate more (or less) pipeline and LNG supplies and export (or import) and address any short-term imbalances using its connectivity with neighboring markets.

<sup>13</sup> Defined as the five EU members (Romania, Bulgaria, Greece, Croatia, and Slovenia) as well as the other former Yugoslav republics and Albania. However, apart from Serbia, the markets in Bosnia and Herzegovina and North Macedonia are very small. Most of the demand is centred in Romania, Greece, and Bulgaria.

Figure 5 | Romania gas balance (in bcm)

	2019	2020	2021	2022	2023
<b>Production</b>	10.0	9.0	8.9	8.7	9.3
<b>Imports</b>	2.7	2.1	3.6	2.8	2.6
<b>Exports</b>	0.01	0.1	0.7	0.9	2.2
<b>Net imports</b>	2.7	2.0	2.8	1.9	0.4
<b>Total supply</b>	12.7	11.0	11.8	10.6	9.7
<b>Gross inland demand</b>	11.2	11.8	12.1	9.8	9.5

“Buletin Statistic de Industrie.”

## Diversifying the energy mix

Additional variables that could impact energy security and the demand for Caspian fossil fuel supplies are the development of neighboring sources of natural gas reserves and growth in Caspian renewables.

### Black Sea supplies

Traditionally, there has been very little gas production in Turkey and in Southeastern Europe, but Black Sea developments are changing this.

Romania imported 1.9 bcm in 2022 to meet its domestic demands, but this fell to just 0.4 bcm in 2023. Moreover, the planned development of Black Sea gas field Neptun Deep should flip the country from net importer to net exporter. The size of its future exports is uncertain, as the volume will depend on demand within Romania itself. Of the 8 bcma expected from Neptun Deep at peak production, it is possible that half will remain in Romania, with around 3–4 bcma available for export. Romania is connected to Hungary (the interconnector capacity is planned to be raised to more than 4 bcma), Bulgaria, Moldova, and Ukraine, so its options for exports are extensive.

In Turkey, reserves in the Sakarya field are now officially stated to be more than 700 bcm, but this figure is disputed. Although actual production began in 2023, as of February 2024 output was much lower than anticipated, casting doubt on whether the operator, Turkish Petroleum, can deliver on its Phase II production target of 15–16

bcma in 2027.<sup>14</sup> Off the coast of Romania, partners OMV Petrom and Romgaz secured an FID on the Neptun Deep project in June 2023, with the first gas scheduled for 2027 and plateau production of 8 bcma due to be reached in 2028.<sup>15</sup> These are significant developments. For Turkey, 15 bcma from Sakarya will cover 20–25 percent of domestic demand by 2028; for Romania, Neptun Deep will move it from being a small net importer to a net exporter of gas. The project might also cement Romania’s position as the top producer in the EU, potentially topping the Netherlands’ production.

### Caspian renewables

In addition to its fossil fuel resources, growth in renewables in the Caspian region has the potential to contribute to Europe’s energy security. By developing renewables, the region can increase its exports of electricity to its Western neighbors.

Of the Caspian countries, Azerbaijan is the most focused on exporting electricity derived from renewables to markets in and beyond Turkey. Its development of renewable sources of energy is bound to be a focus of intense interest throughout 2024, as it will be hosting the COP29 climate change conference in November. The country is developing a decarbonization strategy to increase its renewables capacity to 30 percent of its energy mix. One key development appears to be the recent series of MoUs and agreements with the United Arab Emirates’ renewable energy company, Masdar, for

<sup>14</sup> “Turkey’s Sakarya gas field output to reach 5 million cu m/d in May,” Platts European Gas Daily, April 19, 2024.

<sup>15</sup> Julian Bowden and Patrick Heather, “Romania’s Neptun Deep FID: Can It Be a Regional Gamechanger?” Oxford Institute for Energy Studies, July 2023, <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2023/07/Insight-133-Black-Sea-upstream-Neptun-Deep-FID-taken.pdf>.

the development of 4 gigawatts (GW) of solar, wind, and green-hydrogen projects.

Azerbaijan's total generating capacity is 8 GW, of which 6.6 GW is thermal capacity operating on natural gas, and 1.1 GW is hydro capacity. Total capacity of wind, solar, and biomass combined is 160 MW, which has remained relatively flat over the last four years.

Total electricity generation reached a record output of 28 billion kilowatt hours (kwh) in 2021. That same year, with hydro output of 1.3 billion kwh, and wind, solar, and biomass together producing 0.3 billion kwh, total renewable energy systems (RES) output was just 5.8 percent of the country total. Gas accounted for no less than 94 percent of production.

Another feature of the system is that, since 2007, Azerbaijan has been a small, but growing, net exporter of electricity. In 2021, gross exports were 1.7 billion kwh (6 percent of total power generated). Georgia has recently been the main export customer, but power is also exported to Azerbaijan's neighbors Russia and Iran, and, via Georgia, to Turkey.

Azerbaijan is now trying to increase the share of installed capacity of renewable energy to 30 percent of its total electricity mix by 2030. The country has several solar energy projects under way, including the connection of the 760-megawatt (MW) Banka and Bilasuvar solar energy projects to Azerbaijan's electricity grid. Such developments, together with the Masdar plans, would enable Azerbaijan to meet its 30-percent target. However, the scale of the Masdar projects—4 GW equals half of the current total generating capacity—raises questions about whether they could be feasibly deployed by 2030.

Aside from the costs and economics associated with establishing a renewables value chain in Azerbaijan, which are out of scope for this paper, the speed of installation hinges upon several factors and a much larger energy system strategy as the country aims to transition to clean energy.

Reaching 4 GW in renewables generation capacity would require a system-wide overhaul in the way power is generated and delivered, as Azerbaijan's energy sector currently relies almost entirely on fossil fuels. The system's transformation could, thus, take much longer than planned. As it stands, the renewables plan primarily focuses on production, with little attention to supply chains, transportation, and marketing. Incorporating large-scale renewables capacity will require an integrated

approach to link upstream production with the formidable downstream issues. A completely new supply chain needs to be built. Also, because 4 GW is too small to support a domestic industry manufacturing turbines and marine and other cables, these will all need to be imported. Local blade manufacturing will probably have to be established because of problems with transporting these parts. Maintenance organizations will also need to be created. Moreover, generating 30 percent of power with renewables will introduce new challenges of managing the intermittency of wind and solar energy on a large scale.

Assuming renewables expansion moves forward, an additional hurdle to exporting electricity is transport. In December 2022, Azerbaijan, Georgia, Romania, and Hungary entered into an agreement to build a 1-GW cable across the Black Sea, but this idea is at a very early stage of project definition. Completion before 2030 appears unlikely.

A transport system for hydrogen over long distances would also require a lengthy timeline to implement. Hydrogen could be simpler to deliver in the form of ammonia, but this introduces a new dimension to the commercial framework in understanding and operating the ammonia value chain. High costs of complex transport arrangements will clearly have an impact on netback expectations.

With the multiple challenges facing Azerbaijan's renewables program, it will most likely progress over a medium- to long-term framework, rather than as a contribution to Europe's current energy crises. A ten-year horizon for its 30-percent goal might seem more realistic.

## Conclusion

The outlook for increased gas exports from the Caspian to Southeast Europe to diversify the latter's energy supplies is reasonable, in that it is feasible to see increased production from Azerbaijan and the start of exports from Turkmenistan.

This shift is enabled by a rapidly changing energy landscape that has been transformed by increased interconnectivity. At the same time, demonstrable supply diversity and the potential for significant volumes to come from the Black Sea developments at Sakarya and Neptun could preclude the need for more Caspian gas.

At present, the gas market in Southeastern Europe looks to be well supplied, but greater certainty around

Caspian exports would be beneficial. If more pipeline gas becomes available from the Caspian region, it is possible that Southeastern Europe is overbuilding LNG regasification capacity. Meanwhile, a surge in Caspian gas exports, coupled with the widening array of prospective LNG suppliers, will continue to boost market liquidity, encouraging the development of regional energy hubs.

For renewables, the outlook is more complex. Export of renewables in the form of electricity or hydrogen requires the resolution of major problems concerning supply chains and transportation. In the meantime, however, an increased use of renewables within Caspian countries, notably Azerbaijan and Kazakhstan, should enable them to either maintain or increase their fossil fuel exports to Southeast Europe, further bolstering the region's energy security.

These factors combined—greater regional interconnectivity, large fossil fuel resources, political support for their development, and growth in domestic renewable energy generation—increase the potential for the Caspian to contribute even further to European energy security. Financial and geopolitical forces will determine whether and how quickly they can do so.

## About the authors

**John M. Roberts** is a nonresident senior fellow at Atlantic Council's Global Energy Center. He is also a senior partner with Methinks, a consultancy specializing in the interrelationship between energy, economic development, and politics. He has particular expertise in the development of energy in the Caucasus and Central Asia and in the pipelines connecting or intended to connect the Caspian to China, Russia, India, and Europe.

Roberts is one of Europe's leading energy security specialists. He served as a managing editor at Platts for twelve years and previously with Financial Times Energy, focusing on the development of energy and on the impact of energy on development. In assessing global energy security issues, he has regularly toured the Gulf and the Caspian, as well as visiting the Alaskan North Slope, the Athabasca Tar Sands, China, Norway, and Venezuela.

He has also testified to UK parliamentary committees on Turkish, Russian, Caspian, and Mideast energy security issues. He is currently researching energy security in the Eastern Mediterranean and Northern Iraq and the role of

Middle Corridor in conveying renewable and conventional energy from Central Asia to both Asian and European markets.

He is a member of the UN Economic Commission for Europe (UNECE) Group of Experts on Gas, for which he has written a set of major papers: *How Natural Gas Can Displace Competing Fuels* (2019); *How Natural Gas Can Support the Uptake of Renewable Energy* (2019); and *The Potential of Natural Gas to Penetrate New Markets* (2020).

His books include *Caspian Pipelines* (1996), *Visions & Mirages: The Middle East in a New Era* (1995), and *Beyrouth: L'Été '82* (Beirut, Summer of '82) (1983).

His view on the current energy crisis is this. We face a paradox: we have never needed fossil fuels so much; we have never needed to get out of fossil fuels so much.

**Julian Bowden** is a senior visiting research fellow at the Oxford Institute for Energy Studies (OIES). Prior to joining OIES, he worked for BP for four decades in a variety of mainly planning, strategy and business development roles in downstream oil and international gas. His international roles included postings to BP's offices in Moscow and Brussels. He was involved in the planning for Caspian crude oil exports (culminating in the BTC pipeline) and later in the development of the southern gas corridor.

Publications include chapters on Azerbaijan and Georgia in an OIES book on CIS gas, a chapter on SE Europe's gas markets in a European Commission sponsored book on gas in the EU's energy union and research papers on gas pricing for the IGU. He has also published an academic journal article on Soviet oil marketing in the UK in the 1930s. For OIES more recently, he has published papers on SE European gas developments, the potential energy outcomes of the Azeri-Armenia conflict, and gas in the East Mediterranean. Principle interests remain in gas and broader energy issues in Eurasia.

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