Potential Expansion of the Southern Gas Corridor (SGC): New Realities and Opportunities

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Abstract

The article clarifies the directions in which the Southern Gas Corridor (SGC) can be expanded and gas can be transported to how many countries. For the expansion of the SGC, countries such as Bulgaria, Poland, Hungary, the Czech Republic, and Romania are studied in this paper.

The issue of reducing Europe's 40% dependence on Russian gas and Europe's search for alternative energy sources and the expansion of the Southern Gas Corridor, one of the largest gas export projects to Europe, are on the agenda. In addition, the threat of several European countries - Poland, Bulgaria, Finland, the Netherlands, and Denmark - refusing to pay for Russian gas in rubles, and as a result, the supply of gas is cut off.

The goal of the Southern Gas Corridor project is to develop the second phase of the Shah Deniz gas condensate field, initially to export natural gas to Turkey and Southern Europe via the expanded South Caucasus Pipeline, TANAP, and TAP. In addition, the Shah Deniz Phase 2 project, the second phase of the full-scale development of the Shah Deniz project, is a huge project that will deliver Azerbaijani gas to Southeast Europe and Turkey, increasing energy security by supplying gas to European markets through the Southern Gas Corridor.
1. Introduction

The next, sixth package of sanctions against Russia's occupation of Ukraine has been approved by the European Commission. The package includes five elements: oil import restrictions, oil transportation services, financial and business services measures, broadcasting suspension, and export restrictions.

Given the EU's imports of 48 billion euros worth of crude oil and 23 billion euros worth of refined oil products from Russia in 2021, the embargo on oil imports was imposed this year for the reasons listed. Another natural resource restriction will be the ban on Russia's oil shipments to third countries and the insurance and financing of oil transportation.

Beyond sanctions, the EU has made it plain that they must reduce their reliance on Russian energy imports as soon as possible. On May 18, 2022, the Commission adopted its REPowerEU Plan, which aims to reduce reliance on Russian fossil fuels as quickly as possible and address the climate issue. The EU's imports of Russian oil are expected to plummet by 92 percent as a result of the new limitations.

The Southern Gas Corridor, which transports Azerbaijani gas to Southeast Europe, has created a reliable country profile in a short period of time as a gas exporter to Azerbaijan. According to a statement signed between Azerbaijan and the EU in 2011, the SGC is a route that transports Azerbaijani gas directly to Europe in the Caspian Sea. The Joint Statement, together with the TANAP and TAP Intergovernmental Agreements, paved the way for long-term gas sales agreements. On June 27, 2012, President of the Republic of Azerbaijan Ilham Aliyev and Prime Minister of Turkey Recep Tayyip Erdogan signed an agreement on TANAP. The foundation of the Southern Gas Corridor was laid on September 20, 2014. On March 17, 2015, a groundbreaking ceremony for TANAP was held in Kars, Turkey, and construction of the pipeline began. The groundbreaking ceremony for TAP was held on May 17, 2016, in Thessaloniki, Greece, and construction of the pipeline began. On May 29, 2018, the Southern Gas Corridor was opened in Baku, and on June 12, 2018, the Trans-Anatolian Pipeline (TANAP), an important part of this corridor, was inaugurated in Eskisehir. On June 30, 2018, the first commercial gas was sent to Turkey via the Trans-Anatolian Pipeline (TANAP). On November 30, 2019, the opening ceremony

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of the section of the TANAP gas pipeline connecting Europe was held. The supply of Azerbaijani natural gas to the European market through TAP began on December 31, 2020. The total cost of the Southern Gas Corridor is about $33 billion.\(^3\)

The Russian-Ukrainian war accelerated plans to diversify Europe's gas resources and routes. It can be said that European countries are largely dependent on a single source of gas. To overcome this dependence, SGC transports European gas from the Caspian Sea. The corridor, which began operating in late 2020, delivered 10 billion cubic meters of gas in the first quarter of 2022. By the end of 2022, about 10.5 billion cubic meters of gas are expected to be delivered\(^5\). These figures are expected to reach 11 billion cubic meters in 2023\(^6\).

The reduction in gas supplies from Russia will make Europe think more seriously and faster about alternative energy sources. This will lead to the construction of renewable alternative power plants, which will cost more\(^7\).

90% of gas in Europe is imported, and only 40% is imported from Russia. Efforts are being made to reduce this dependence by two-thirds in the future. In the long run, the REPowerEU Plan has been developed to reduce any energy production from Russia. The plan is also a tool to show that 85% of Europeans are on Ukraine's side in the Ukraine-Russia war. There is a growing need to reduce Russian gas, which costs European taxpayers $100 billion a year and causes a climate crisis, as well as being used as an economic and political weapon against Europe\(^8\).

Aside from all these long-term and costly efforts, the Southern Gas Corridor is not far from Europe as a relatively fast and reliable energy source. Europe's embargo on Russian gas, Russia's demand for payments in rubles, the refusal of some countries to accept it, the consequent Russian gas cuts, and so on, call for an immediate solution to the energy crisis at the door. The article shows which potential European countries are likely to join the SGC in the future and to what extent other parts of Europe will be supplied with gas\(^9\).

\(^3\) https://minenergy.gov.az/en/layiheler/cenub-qaz-dehlizi_2196
\(^4\) https://president.az/en/articles/view/55362
\(^6\) https://www.azernews.az/oil_and_gas/192911.html
\(^7\) https://cesd.az/y/panel/uploads/22183545776-CESDRESEARCHBRIEFEUEMBARGOONOIL.pdf
\(^8\) https://ec.europa.eu/commission/presscorner/detail/en/IP_22_3131
\(^9\) https://dx.doi.org/10.2139/ssrn.4062092
2. Gas Halt from Russia to EU Countries

With the depreciation of the Russian ruble after the war between Ukraine and Russia, Russia demanded payment in rubles when selling gas. Russian President Vladimir Putin issued a resolution demanding that “unfriendly” countries open an account at Gazprombank to have their euro or dollar payments converted into rubles. As a result of this request, Bulgaria and Poland were first deprived of Russian gas. Bulgaria acquires more than 90 percent of its natural gas supplies from Russia. The Bulgarian Prime Minister said that the situation in Bulgaria and the whole of Europe was open and that he would not resort to blackmail, adding that the payment was made in a currency other than the ruble. Poland also insisted on the move, saying the weather will warm up and gas supplies are now 80%, like Bulgaria, has said it will not pay in rubles, which would violate EU sanctions. Poland's natural gas supply contract with Gazprom includes 10 billion cubic meters per year and covers around 50 percent of the country's consumption.

Generally, gas flow to Poland, Bulgaria, and Finland, which previously refused to pay in Russian rubles, was cut off by the Russian energy company Gazprom.

Another country where gas supplies have been cut off is Finland. However, unlike other countries, it was clear that Finland would face the same consequences due to the news of its membership in NATO. On May 21, 2022, the Finnish state-owned company Gasgrid Finland announced that the gas supply from the Imatra entry point had been cut off. Finland imports most of its gas from Russia, but it accounts for less than a tenth of the country's energy consumption.

Dutch state-owned gas company GasTerra has stated that Gazprom will stop supplying natural gas to the Netherlands as of May 31, as it refuses to pay in rubles. In the statement made by GasTerra, the decree reminded that Russia demanded the European Union (EU) member countries make natural gas payments by opening a euro and ruble account with Gazprombank.

In the statement, it was stated that GasTerra did not accept to make payments according to the said decree, “Paying in this way includes the risk of breaching EU sanctions, as well as financial and operational risks. Opening an account in Moscow in accordance with Russian law and having this account under the control of the Russian regime is a much greater risk for our company. In response to our refusal to pay in this way, Gazprom announced that it will stop supplying natural gas as of 31

May.” it was said. It was emphasized that the cessation of supply by Gazprom between May 31 and October 1, when the current contract date expires, means that 2 billion cubic meters of natural gas will not be purchased13.

Russia cut off gas supplies to Denmark on June 1, 2022, following a power outage in the Netherlands on May 31, 202214. Denmark's largest energy company, Orsted, also refused to pay Gazprom in rubles instead of euros. There is no gas pipeline directly connecting Russia to Denmark. Therefore, even if the valve is closed, Denmark will not be immediately affected15.

After all this, Greece is also taking precautionary measures. Greece gets more than 30% of its annual energy needs from Russia. And the next Gasproma made the payment in euros in April under a contract until 2026. Greece said it could receive additional liquefied natural gas and natural gas from Azerbaijan as part of an emergency plan, and that it could line up four gas-fired power plants. Atina will also accelerate coal mining in the next two years as a temporary precaution16.

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13 https://tr.shafaqna.com/archives/285722/rusyadan-avrupaya-gaz-resti/
15 https://www.theguardian.com/world/2022/may/31/russia-cuts-gas-supplies-dutch-state-trader-sanctions-war
3. Azerbaijani Gas as Alternative to Russian Gas for EU

As stated in the introduction, the Southern Gas Corridor is the only way to deliver Azerbaijani gas directly to Europe and it promotes the economic development of both Azerbaijan and the transit countries. Gas is supplied to the European market via the South Caucasus Pipeline extension (SCPx) through Azerbaijan and Georgia, the Trans-Anatolian Pipeline (TANAP) through Turkey, and the Trans-Adriatic Pipeline (TAP) through Greece, Albania, and Italy (Figure 1).

**Figure 1. The route of the Southern Gas Corridor**

![The route of the Southern Gas Corridor](https://www.sgc.az/en)

*Source: Southern Gas Corridor*¹⁷

The branch of the Southern Gas Corridor to Europe is the Trans Adriatic Pipeline. Through this branch, Azerbaijani gas is exported to Greece, Albania, and Italy, ie to Europe. In this sense, TAP is of great importance for the next resource trade between Europe and Azerbaijan.

TAP is a critical component of the Southern Gas Corridor, providing a direct and cost-effective transit link to countries in Southeast Europe and beyond (Figure 2). It brings natural gas from the Caspian basin to Europe, connecting with the Trans Anatolian Pipeline (TANAP) at the Greek-Turkish border, passing through Northern Greece, Albania, and the Adriatic Sea before alighting in Southern Italy and connecting to the Italian natural gas system.

**Figure 2. The Gas Chain of the Trans Adriatic Pipeline**

¹⁷ [https://www.sgc.az/en](https://www.sgc.az/en)
The TAP project can be expanded to supply gas to other European countries. Bulgaria is facing problems with gas supplies to Russia because it does not pay for gas in rubles. As can be seen from the map, Bulgaria is not far from this project. It is possible that the country will hold talks with Azerbaijan, which is highly confident that it will not face problems with gas supply in the future.

Azerbaijan's natural gas production continues to rise. Azerbaijan generated 11.8 billion cubic meters of natural gas in the first quarter of 2022. ACG generated 3.5 billion cubic meters of gas, Shah Deniz 6.4 billion cubic meters, and SOCAR 1.9 billion cubic meters. Gas shipments totaled 5.9 billion cubic meters during the time. Turkey received 2.2 billion cubic meters of gas, Europe received 2.6 billion cubic meters, and Georgia received 1.1 billion cubic meters. TANAP transported more than 4 billion cubic meters of gas to Turkey during this time. In the first quarter of 2022, Azerbaijan's natural gas production climbed by 12.0%, while exports increased by 15.3%. Exports of natural gas to Europe surged by 2.4 times. In comparison to the same period last year, 3

Source: Trans Adriatic Pipeline[^18]

billion cubic meters of gas were exported to Turkey, 1.1 billion cubic meters to Europe, and 784 million cubic meters to Georgia\textsuperscript{19}.

Graph 1. Gas Output in Azerbaijan (Billion cubic metr)

\begin{center}
\begin{tikzpicture}
\begin{axis}[
    width=\textwidth,
    height=\axisdefiningheight,
    ybar stacked,
    bar width=10pt,
    ymajorgrids=true,
    grid style=dashed,
    ylabel={Output (Billion cubic meters)},
    symbolic x coords={2017, 2018, 2019, 2020, 2021},
    xtick=data,
    nodes near coords,
]
\addplot coordinates {
(2017, 43.9) 
(2018, 37.1) 
(2019, 35.6) 
(2020, 30.5) 
(2021, 28.6) 
};
\end{axis}
\end{tikzpicture}
\end{center}

\textit{Source: Ministry of Energy, SOCAR, and CESD, 2022}

According to the first quarter of 2021, Azerbaijan produced about 8.8 million tons of oil, including condensate. Oil production, including condensate, was about 552,000 tons less than in the same period last year. During this period, 5.9 million tons of oil production in the country was obtained from the Azeri-Chirag-Guneshli and 959,000 tons (condensate) from the Shah Deniz fields. SOCAR's oil production, including condensate, amounted to 1.9 million tons.

As can be seen from the Graph (1), Azerbaijan's gas production has increased significantly in recent years. Compared to 2017, gas production in 2021 will increase 1.5 times. Year-on-year increases in gas production mean greater export opportunities for Azerbaijan. In this regard, the increase in production is also appreciated in terms of export potential. On the other hand, the development of

\textsuperscript{19} https://cesd.az/y/panel/uploads/32475285090-CESDBriefAzerbaijaniGasExport.pdf
new gas fields in the Azerbaijani part of the Caspian Sea will allow for further increased production in Azerbaijan.

**Graph 2. Azerbaijani Gas Export (Billion cubic meters)**

![Graph of Azerbaijani Gas Export](image)

*Source: Ministry of Energy, SOCAR, and CESD, 2022*

As indicated in the Graph (2), the gas export of Azerbaijan is also growing sharply. Thus, in comparison with 2018, gas production in 2021 increased twofold. It raises the role of Azerbaijan in forming the energy security of the region.

The proved gas reserves of Azerbaijan are 2.6 trillion cubic meters, with estimated reserves of around 3 trillion cubic meters. The "Umid" field alone has a potential of more than 200 billion cubic meters. It will allow Azerbaijan to be considered a reliable hydrocarbon resource supplier for the next 100 years. On March 12, 2022, the Minister of Energy of Azerbaijan, Parviz Shahbazov, confirmed that Azerbaijan's gas reserves are sufficient for neighboring and European countries.

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As expressed in the Graph (3), the volume of Azerbaijan's gas purchased by Europe has grown lately. Since the end of 2020, Azerbaijan has been exporting its natural gas to the European market. According to the latest statistics, gas exports to Europe will exceed 10 billion cubic meters in 2022. Altogether, the purpose of the Southern Gas Corridor is to send 20 billion cubic meters of gas a year to Europe.

Delivery of Azerbaijani gas to other European countries is not new. Gas from TAP, the European branch of the Southern Gas Corridor, joins the Ionian Adriatic Pipeline and is transported to southern European countries. The Ionian Adriatic Pipeline (IAP) proposal is based on the idea of connecting the current Croatian gas transmission system with the TAP (Trans Adriatic Pipeline) or a comparable project via Montenegro and Albania. The gas pipeline runs for 511 kilometers from the Croatian town of Split to the Albanian town of Fieri. Its 5 billion cubic meters per year capability supplies natural gas to Albania (1 billion cubic meters), Montenegro (0.5 billion cubic meters), Bosnia and Herzegovina's south (1 billion cubic meters), and Croatia (2.5 bcm).

Source: Ministry of Energy, SOCAR, and CESD, 2022
4. Potential Gas Importer Countries

4.1 Bulgaria

The amount of oil produced in Bulgaria is extremely limited (185 kt in 2019). Imports totaled 9.2 million tonnes in 2019, up 15% from the previous year's 16 million tonnes, with almost 7.1 million tonnes of crude oil and 2.2 million tonnes of oil products. Bulgaria is expected to import 4.9 million tonnes of crude oil and 2.1 million tonnes of oil products in 2020, according to preliminary projections. Russia supplied 65 percent of crude oil imports in 2019, followed by Egypt (24 percent). In 2019, three nations accounted for over 90% of oil product imports: Romania (44%), Russia (39%), and Greece (7%).

Since 2013, oil consumption has been quickly growing (+4.6 percent/year), reaching 4.4 Mt in 2019; between 2006 and 2013, it declined by 4.4 percent/year to 3.3 Mt. Oil product consumption is expected to fall by 9% in 2020, according to preliminary forecasts.

Transportation consumes approximately 60% of oil product use (64 percent in 2019), while industry consumes only 16% (including non-energy uses).\(^{22}\)

Since 2017, gas usage has decreased by 5.1 percent every year, reaching 2.9 billion cubic meters in 2019. Between 2014 and 2017, it increased at a rate of 4.9 percent per year. According to preliminary data, it increased by 3.4 percent to 3 billion cubic meters in 2020. Between 1996 and 2002, gas usage was cut in half, and between 2002 and 2014, it hovered at 3 billion cubic meters.

The industry continues to be the largest gas consumer, accounting for 40% of total consumption, including non-energy applications, while the power sector's share has declined from 30% in 2010 to 25% in 2019.

Russian gas shipments of 3 billion cubic meters per year cover around 90% of Bulgaria's gas needs. Bulgaria has already stated that it would not seek to prolong its 10-year gas supply agreement with Gazprom, which expires at the end of 2022. Bulgaria should receive support from its neighboring Greece, with whom it is connected; but, delays in gas pipeline building have prevented Bulgaria from importing 1 billion cubic meters of Azerbaijan gas that it had contracted through Greece.\(^{23}\)

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\(^{22}\) [https://www.enerdata.net/estore/energy-market/bulgaria/](https://www.enerdata.net/estore/energy-market/bulgaria/)

These figures suggest that Bulgaria's annual gas consumption is 3 billion cubic meters. After Russia cuts off gas supplies to Bulgaria, Bulgaria can get up to 2 cubic meters of gas from Azerbaijan. This means that 30% of Bulgaria's energy needs will be met.

4.2 Poland

The energy balance of Poland is electricity, crude oil, and natural gas. Poland consumed 4.06 quadrillion British thermal units of primary energy in 2019. Coal contributed 45 percent of total consumption. The remaining percentages of consumption were made up of petroleum and other liquids (31%), natural gas (17%), and renewable energy sources such as hydropower (7%).

Poland consumed 203.904 bcm of natural gas in 2019. Poland imports more than 80% of its natural gas, the majority of which is from Russia. 24

Natural Gas Production in Poland was 5,593,000 Cub m mn which was reported in the last month of 2020. There is a slight decrease from 2019 with 5,669,000 Cub m mn for the same period.

The import of crude oil in Poland was around 542,900 barrels per day in 2018. The natural gas reserves were 68 bn s cu m in 2018. World marketed production of natural gas was 5,616 million cubic meters by Poland. 25

4.3 Hungary

The energy balance of Hungary comprises electricity, crude oil, and natural gas. Fossil fuels provide for the majority of Hungary's total energy supply, with natural gas taking the lead, followed by oil and coal.

The natural gas consumption of Hungary was 4.014 trillion cubic meters in 2020. As indicated above, Hungary has gas trade relations with several countries. So, Azerbaijan's gas has the potential for being imported by Hungary. Southern Gas Corridor can supply 0.05% of the gas consumption of Hungary.

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24 Bcf was converted to bcm. https://www.eia.gov/international/analysis/country/POL
Hungary has MOL (Hungarian Oil and Gas PLC) which is a multinational oil and gas corporation. It is involved in the exploration, development, and production of crude oil, natural gas, and other gas products. Natural gas transportation and storage, fleet management, oilfield services, car and bike-sharing, mobility solutions, rental services, real estate management, and maintenance services are among the company's other offerings. It also refines, transports, and stores crude oil, as well as markets crude oil products wholesale and retail, and manufacture and sells petrochemicals. The corporation conducts exploration and production operations in the Iraqi Kurdistan region, Russia, Kazakhstan, Pakistan, Egypt, and other Central-Eastern European and African countries. In Hungary, Slovakia, and Croatia, it runs crude oil refineries and petrochemical factories. Hungary exported $739 million worth of petroleum gas in 2020, making it the world's 31st largest exporter. Petroleum Gas was Hungary's 34th most exported product in the same year. Ukraine ($290 million), Croatia ($155 million), Serbia ($122 million), Romania ($74.8 million), and Germany ($37.5 million) are the top destinations for Hungary's Petroleum Gas exports. Serbia ($114 million), Croatia ($27.2 million), and Bulgaria ($7.82 million) were the fastest-growing export destinations for Hungary's Petroleum Gas during 2019 and 2020.

Hungary imported $1.44 billion in Petroleum Gas in 2020, making it the world's 26th largest importer. Petroleum Gas was Hungary's 13th most imported product in the same year. Russia ($536 million), Austria ($471 million), Ukraine ($200 million), Slovakia ($75.7 million), and Bulgaria ($43.1 million) are the main suppliers of petroleum gas to Hungary. Bulgaria ($42.7 million), Croatia ($6.69 million), and Romania ($6.03 million) were the fastest rising import markets in Petroleum Gas for Hungary during 2019 and 2020.26

### 4.4 Czech Republic

As of 2016, Czechia ranked 84th in the world with 15,000,000 barrels of proved oil reserves, accounting for around 0.0 percent of the world's total oil reserves of 1,650,585,140,000 barrels. Czechia's total oil reserves are less than a year's worth of use (65,684,044 barrels as of 2016), rendering the country largely reliant on oil imports to keep its consumption levels stable.

In 2016, Czechia consumed 179,956 barrels of oil per day. Czechia consumes roughly 0.2 percent of the world's total oil consumption of 97,103,871 barrels per day, ranking 58th in the world.

Czechia uses 0.71 gallons of oil per person per day, or 260 gallons per year (based on a population of 10,618,857 persons in 2016).

Czechia ranks 86th in the world in terms of oil production, with 15,586.33 barrels per day produced in 2016.

Czechia generates an amount equivalent to 37.9% of its total proved reserves every year (as of 2016).

Czechia imports 59% of the oil it consumes (106,663 barrels per day in 2016).\(^\text{27}\)

### 4.5 Romania

Romania is the largest oil and gas (O&G) producer in Central and Eastern Europe, with the potential to lead the European oil and gas market as a result of Black Sea discoveries and post-BREXIT. From 10,772 kilometers in 1990 to 43,563 kilometers in 2020, Romania's natural gas distribution network has grown fourfold in the last three decades.

In 2020, compared to 2019, the length of the natural gas distribution network expanded by 3% to 43,563 kilometers, serving around 6.5 million consumers with average annual consumption of around 9 billion cubic meters.\(^\text{28}\)

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\(^{27}\) [https://www.worldometers.info/oil/czechia-oil/](https://www.worldometers.info/oil/czechia-oil/)

\(^{28}\) [https://www.trade.gov/country-commercial-guides/romania-energy](https://www.trade.gov/country-commercial-guides/romania-energy)
5. Conclusion

The expansion of the Southern Gas Corridor means an increase in the supply of safe gas to Southeast European countries and other European countries through transit routes. Recent changes in the agenda have forced Europe to think seriously about this issue and take action. Russia's move to cut off gas supplies to a large percentage of Europe is causing difficulties for many countries. Europe must quickly find alternative routes that are safer, quicker, and less costly. Alternative and prompt gas supply is significant for low-consumption countries. Although, all these measures are not quite sufficient for Europe. Russia's suspension of gas supplies, starting with Bulgaria, has exacerbated the problem. The study shows that countries like Bulgaria, Poland, the Czech Republic, Romania, and Hungary can meet a certain part of their annual gas consumption by joining the Southern Gas Corridor as the best source of energy. This potential cooperation could show that in the future other countries can rely on a reliable and importance-growing source like Azerbaijan.

Officials in Europe want the Southern Gas Corridor mega pipe to play a stronger role in Europe's energy security by serving more countries and purchasers in the region. “We are eager to explore the possibility of extending the Southern Gas Corridor to the Western Balkans, based on the significant progress made this year in finalizing the Southern Gas Corridor,” European Commissioner for Neighborhood and Enlargement, Oliver Varhelyi, said in a statement, according to S&P Global.

Azerbaijan needs investment in broader gas cooperation with Europe. As it is known, such transit trade relations require a lot of financial resources, and given the distance, investment is the most important issue in this regard. In addition, certain contracts and detailed conditions need to be developed - within what timeframe and on what terms - to expand trade with Europe.

Through an unbroken supply of Azerbaijani gas in TAP, the 3,500-kilometer-long Southern Gas Corridor contributes to increasing European energy security, diversifying European energy sources, and aiding Europe's decarbonization efforts. Azerbaijan's rising importance in the European Union's energy security increases the country's regional geopolitical stance.
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