



Independent Statistics & Analysis

U.S. Energy Information
Administration

Country Analysis Brief: Azerbaijan

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Overview

Oil and natural gas production and exports are central to Azerbaijan's economy. The country is one of the Caspian Sea region's most important export routes to the West.

Azerbaijan, one of the oldest oil-producing countries in the world, is an important oil and natural gas supplier in the [Caspian Sea region](#), particularly for European markets. Although traditionally it has been a prolific oil producer, Azerbaijan's importance as a natural gas supplier will grow in the future as field development and export infrastructure expand. Conflicting claims over the maritime and seabed boundaries of the Caspian Sea between Azerbaijan and [Iran](#) continue to cause uncertainty.

Natural gas accounted for 67% of Azerbaijan's total domestic energy consumption in 2013. Oil accounted for 31% of total energy consumption. Hydropower and other sources accounted for a small amount of total consumption (Figure 2).¹ Overall, Azerbaijan is a net energy exporter. The country swaps small volumes of natural gas with Iran—the Nakhchivan exclave receives all of its natural gas from Iran, because it is not connected to Azerbaijan's pipeline network.

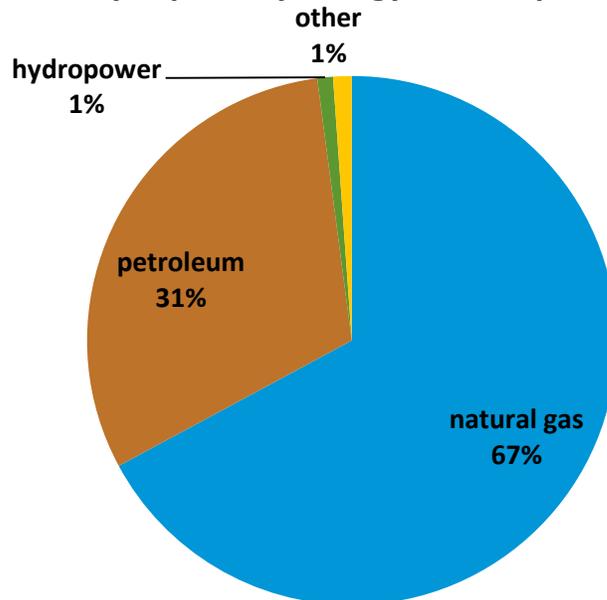
Crude oil and natural gas production and exports are central to Azerbaijan's economy, and lower oil prices have reduced government revenues. The State Oil Fund of the Republic of Azerbaijan (SOFAZ), established in 1999 to manage currency and assets from oil and natural gas activities, had \$33.6 billion in managed assets at the beginning of 2016, down 9.5% from the beginning of 2015. According to SOFAZ, oil revenues fell from 12.3 billion manats in 2014 to 7.4 billion manats in 2015, declining about 40%.²

Figure 1. Map of Azerbaijan



Source: CIA World Factbook

Figure 2. Azerbaijan primary energy consumption, 2013



Source: U.S. Energy Information Administration based on International Energy Agency

Petroleum and other liquids

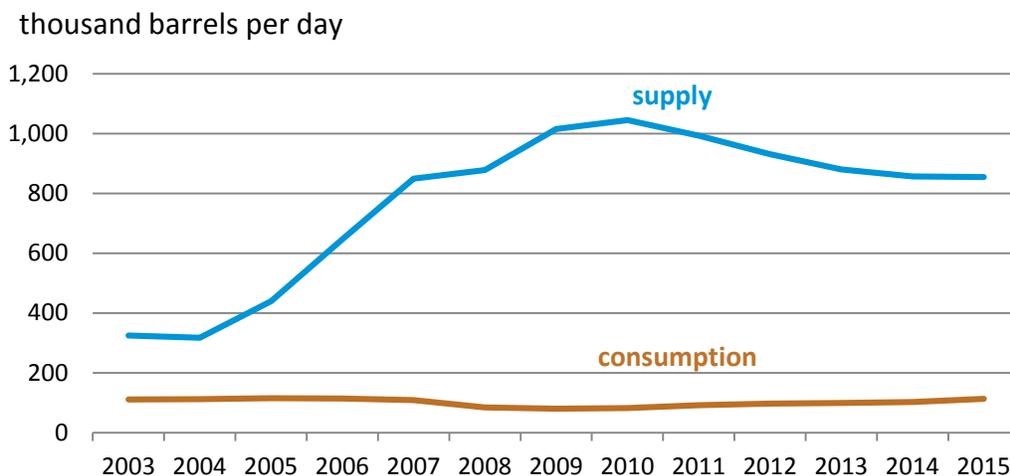
Azerbaijan is one of the world's oldest oil producers. Most of Azerbaijan's hydrocarbons production comes from offshore fields in the Caspian Sea.

Azerbaijan's proved crude oil reserves were estimated at 7 billion barrels at the end of 2015, according to the *Oil & Gas Journal* (OGJ).³ In 2015, Azerbaijan produced about 850,000 barrels per day (b/d) of petroleum and other liquids and consumed about 100,000 b/d (Figure 3).

Azerbaijan is one of the world's oldest oil-producing countries, and it has played a significant role in the development of today's oil industry. The world's first paraffin factory was opened in Azerbaijan in 1823, and the world's first oil field was drilled in the country in 1846. Azerbaijan was the site of the first offshore oil field—the Neft Dashlary—in the shallow water of the Caspian Sea, which was completed in 1951. The oil field still produces oil today.

The country's largest hydrocarbon basins are located offshore in the Caspian Sea, particularly the Azeri-Chirag-Gunashli (ACG) fields, which produced 634,000 b/d in 2015,⁴ accounting for almost 75% of Azerbaijan's total oil output in 2015.

Figure 3. Azerbaijan petroleum and other liquids consumption and production



Note: 2015 data is preliminary

Source: U.S. Energy Information Administration

Sector organization

The State Oil Company of the Azerbaijan Republic is involved in all segments of the oil sector. SOCAR produces about 20% of Azerbaijan's total oil output, with the remainder produced by international oil companies.

The Ministry of Energy formulates state energy policy and regulates the national oil company, the State Oil Company of the Azerbaijan Republic (SOCAR). In addition, the Ministry is tasked with attracting foreign investment and conducting negotiations on pipelines and production-sharing agreements.

SOCAR is involved in exploring and producing oil and natural gas in Azerbaijan. In 2015, SOCAR produced 164,000 b/d of oil, about 20% of Azerbaijan's total oil output.⁵ SOCAR also operates the country's two refineries, runs the country's pipeline system, and it manages the country's oil and natural

gas imports and exports. In addition, much of Azerbaijan's oil is marketed by the SOCAR's Geneva-based subsidiary, SOCAR Trading, which has been operating since 2008.

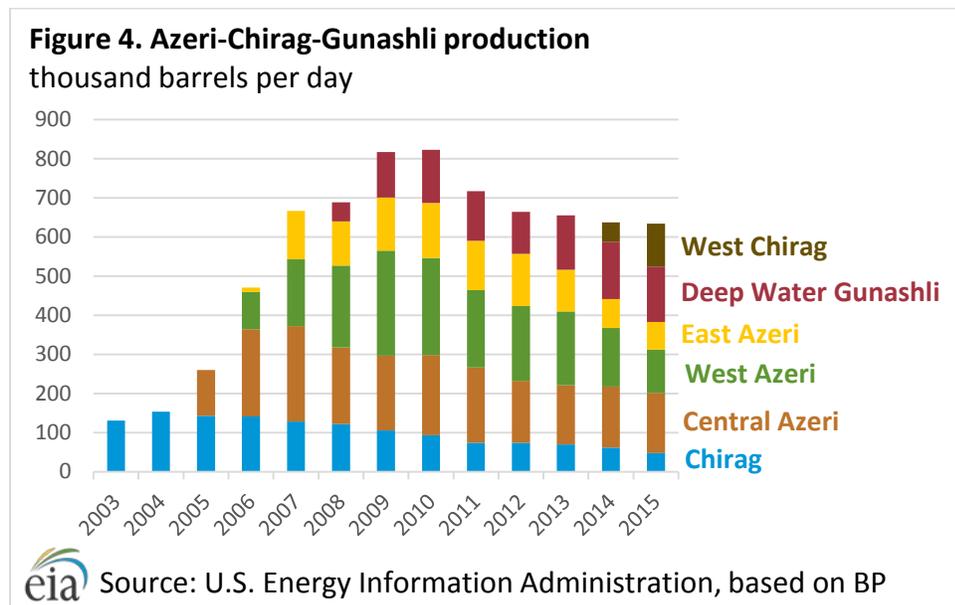
Exploration and production

The Azeri-Chirag-Gunashli fields accounted for about three-quarters of Azerbaijan's petroleum and other liquids production in 2015.

Petroleum and other liquids production in Azerbaijan increased from 315,000 b/d in 2004 to slightly more than 1.0 million b/d in 2010. However, production has generally declined since then, falling to about 850,000 b/d in 2015.

Azerbaijan's main producing field, the Azeri-Chirag-Gunashli (ACG) complex, produced 634,000 b/d of liquids in 2015, accounting for about three-quarters of total liquids production in Azerbaijan. The ACG fields are operated by BP, the largest shareholder in the Azerbaijan International Operating Company (AIOC) which was formed to develop the fields. Other companies with an interest in the ACG fields are Chevron, Inpex, Statoil, Turkiye Petrolleri, ExxonMobil, SOCAR, ITOCHU, and ONGC Videsh.⁶ The current production-sharing agreement (PSA) expires in 2024, but negotiations to extend the PSA until 2040 or later are ongoing between AIOC and the Azerbaijan government.

The field developers originally expected peak petroleum production from ACG to reach 1 million b/d, but ACG production peaked in 2010 at 823,100 b/d before falling to 664,400 b/d in 2012 (Figure 4).⁷ Since 2012, production has been relatively stable, declining about 1.5% per year on average through 2015. ACG has been developed in phases. The most recent phase, the Chirag Oil Project, began producing oil in January 2014 and produced an average of 109,400 b/d in 2015. The platform has a capacity of 183,000 b/d.⁸



BP is the largest foreign investor in Azerbaijan, participating not only in the development of the ACG fields but also in the development of the Shah Deniz gas and condensate field. The BP-operated Shah Deniz field produces a small but stable volume of 50,000 b/d of condensate.⁹ When the Stage 2 development of the Shah Deniz field comes online near the end of the decade, condensate production from the field should more than double. SOCAR also produces some condensate from the shallow-

water Gunashli field. Only the deepwater portion of the Gunashli field is part of the ACG development that BP operates.

Most of the oil produced in Azerbaijan, including oil from the ACG fields, is medium-light, sweet crude. The majority of Azerbaijan's oil is exported through the Baku-Tbilisi-Ceyhan (BTC) pipeline, and it is marketed as BTC blend (36.8° API gravity, 0.15% sulfur).¹⁰ The smaller Baku-Supsa pipeline carries a similar grade of oil, which is marketed as Azeri light (35.2° API gravity, 0.14% sulfur).¹¹ Small volumes of lower-quality oil are exported through the northern export pipeline to [Russia](#). This oil is blended in Russia and marketed as Urals blend. The quality of Urals blend can vary, but the oil is generally a medium, sour crude.

Exports

The completion of the Baku-Tbilisi-Ceyhan pipeline transformed Azerbaijan's oil industry, unlocking the country's oil sector potential by providing an outlet to world markets for crude oil.

Azerbaijan exported about 707,000 b/d of crude oil in 2014, according to the Azerbaijan's State Statistical Committee.¹² Azerbaijan's crude oil exports peaked in 2010 when they averaged slightly more than 900,000 b/d, but exports have fallen every year since then as production has declined.

Azerbaijan has three crude export pipelines (Table 1).¹³ The country also exports small amounts of oil by rail. Most (about 80%) of its oil is exported through the BTC pipeline. The country's oil industry was transformed with the construction of the BTC pipeline. The BTC pipeline allowed for exports of lighter and sweeter crude than Russia's Urals blend and provided transportation capacity out of the Caspian that did not rely on using the [congested Turkish straits](#) or on crossing Russian territory.

In the past, Azerbaijan has also exported crude oil through swaps with Iran. Under a swap agreement, Iran receives crude oil at its Caspian Sea port of Neka, and in return, Iran exports the same amount of crude oil out of its Persian Gulf ports. No crude oil swaps have taken place in more than five years. However, in early 2016, Iran was discussing with Azerbaijan and other Caspian states the potential to resume crude oil swaps in the near future.

Table 1. Azerbaijan's oil export pipelines

Facility	Status	Capacity (thousand barrels per day)	Total length (miles)	Origin	Destination	Details
Baku-Tbilisi-Ceyhan (BTC)	Operating	1,200	1,100	Sangachal terminal, near Baku, Azerbaijan	Ceyhan terminal, on Turkey's Mediterranean coast	First tanker loaded at Ceyhan in June 2006
Baku-Novorossiysk (Northern Route Export Pipeline)	Operating	105	825	Sangachal terminal, near Baku, Azerbaijan	Novorossiysk, on Russia's Black Sea coast	Started operation in 1996
Baku-Supsa (Western Route Export Pipeline)	Operating	100	515	Sangachal terminal, near Baku, Azerbaijan	Supsa, on Georgia's Black Sea coast	First tanker loaded at Supsa in April 1999

Sources: U.S. Energy Information Administration based on BP and SOCAR

Most of the oil transported through the BTC pipeline is from Azerbaijan's ACG fields, but BTC blend also includes condensate from the Shah Deniz field as well as crude oil or condensate from fields in [Turkmenistan](#), [Kazakhstan](#), and Russia. The BTC pipeline originates at Azerbaijan's Sangachal terminal, which can receive oil by tanker from any of Azerbaijan's Caspian neighbors.

In July 2010, near the peak of ACG production and Azerbaijani exports, the BTC pipeline transported slightly more than 1 million b/d of oil. However, the pipeline has recently run with significant spare capacity, exporting on average 720,000 b/d in 2015, considerably below its capacity of 1.2 million b/d.¹⁴ SOCAR has proposed reversing part of the Northern Route pipeline—from Baku, Azerbaijan to Makhachkala, Russia—to bring more Russian oil to Baku for transport through the BTC pipeline to Ceyhan. This change would allow the Russian oil to bypass the crowded Turkish straits. Russian authorities have dismissed the idea as uneconomic.

Azerbaijan is mainly a crude oil and condensate exporter, although the country also exports small volumes of refined petroleum products, mainly diesel. Most of the refined product exports go to Russia, Greece, and Bulgaria.

Figure 5. Major Caspian oil and natural gas export routes



Source: U.S. Energy Information Administration based on IHS EDIN

Refining sector

Azerbaijan had a crude oil refining capacity of 120,000 b/d at the end of 2015, according to the OGI.¹⁵ In 2016, SOCAR began a project to refurbish the Heydar Aliyev Baku refinery and to expand its capacity from 120,000 b/d to 150,000 b/d. The project is scheduled to be completed by late 2018.¹⁶ This project will also allow SOCAR to keep the refinery running for another 15 years. SOCAR plans to build a new refinery, natural gas processing, and petrochemicals complex to replace much of its aging facilities. The Oil and Gas Processing and Petrochemical Complex (OGPC) is currently in the design phase. The OGPC is to be built in phases, with the refinery to come online after 2030 with a capacity of about 170,000 b/d.¹⁷

Natural gas

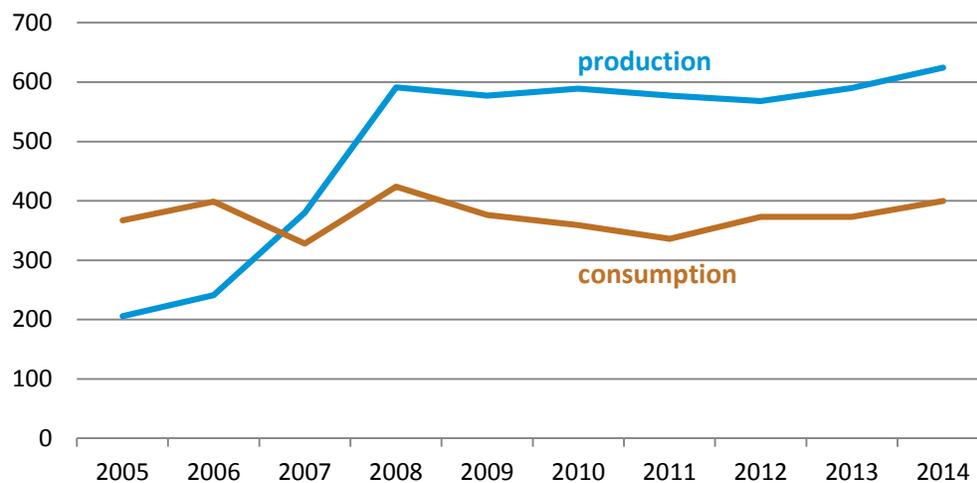
With the startup of the Shah Deniz natural gas and condensate field in late 2006, Azerbaijan became a net exporter of natural gas.

According to the OGI, Azerbaijan's proved natural gas reserves were roughly 35 trillion cubic feet (Tcf) as of January 2016.¹⁸ Most of these reserves are associated with the Shah Deniz field. Although historically an oil producer, Azerbaijan's importance as a natural gas producer and exporter is growing.

In 2013, Azerbaijan produced 590 billion cubic feet (Bcf) of dry natural gas and consumed 373 Bcf (Figure 6). Preliminary 2014 estimates show increases in both consumption and production of 5%-8%. Natural gas plays a central role domestically, accounting for about two-thirds of total energy consumption. About half of the country's natural gas consumption is for power generation.

Figure 6. Azerbaijan dry natural gas consumption and production

billion cubic feet



Note: 2014 data are preliminary estimates.

Source: U.S. Energy Information Administration

Sector organization

SOCAR and its wholly-owned subsidiaries are responsible for natural gas processing, transport, distribution, and storage in the domestic market. Prices for these services are regulated by the Tariff Council of Azerbaijan Republic. SOCAR is also responsible for the domestic transportation of natural gas exported to Iran, Georgia, and Russia.

Exploration and production

The Shah Deniz field, discovered in 1999, is one of the world's largest natural gas and condensate fields. In 2015, Shah Deniz produced almost 350 Bcf of natural gas.

Most of Azerbaijan's natural gas is produced offshore in either the Shah Deniz field or the ACG complex. The Shah Deniz natural gas and condensate field is being developed in two phases, the first of which started production in late 2006. The second phase is scheduled to begin production in 2018 and is expected to produce 565 Bcf of natural gas per year. BP operates the field and is the largest shareholder

with 28.8% of the joint venture that is developing the field. Other joint venture participants include SOCAR (16.7%), Turkish Petroleum Corporation (TPAO) (19%), Lukoil (10%), and Naftiran Intertrade Company (NICO) (10%). In 2015, Statoil sold its 15.5% interest in Shah Deniz to Petronas.¹⁹

The ACG fields provide associated gas to the Azerigaz system for domestic use through an undersea gas pipeline to the Sangachal terminal at Baku. The Sangachal Terminal, located south of Baku, is one of the world's largest integrated oil and gas processing terminals. The terminal receives, stores, and processes crude oil and natural gas from the ACG fields and from Shah Deniz.

Natural gas exports

Stage 2 development of the Shah Deniz natural gas and condensate field will more than double Azerbaijan's natural gas exports by the end of the decade.

Azerbaijan became a net exporter of natural gas in 2007. In 2014, Azerbaijan exported about 240 Bcf of natural gas. Most of Azerbaijan's natural gas exports are shipped through [Georgia](#) to [Turkey](#) through the South Caucasus Pipeline (SCP). The SCP is also sometimes called the Baku-Tbilisi-Erzurum (BTE) pipeline, and it runs parallel to the BTC oil pipeline for much of its route (Table 2).²⁰

Most of Azerbaijan's natural gas exports via SCP are destined for Turkey, but small volumes also go to Greece through the Turkey-Greece interconnector. Under a previous arrangement, Turkey was re-exporting Azerbaijani natural gas to Greece, but a new agreement allows Azerbaijan to directly export volumes to the European Union. The Shah Deniz Stage 2 development will increase exports by 565 Bcf. Turkey is contracted to take 212 Bcf, and [Italy](#) is contracted to take 283 Bcf. Bulgaria and Albania are each contracted to take 35 Bcf. Deliveries to Turkey are scheduled to start in 2018, and deliveries to southeastern Europe are scheduled to begin a year later.²¹

From 2007 to 2014, Azerbaijan also exported small volumes of natural gas to Russia through the Hajiqabul-Mozdok pipeline. In addition, small volumes of natural gas are shipped to Iran through the Hajiqabul-Astara pipeline. In exchange, Iran ships natural gas to Nakhchivan, Azerbaijan's exclave situated between Iran and Turkey. The exclave is wholly dependent on natural gas supplied by Iran.

Azerbaijan has two underground gas storage fields with total working gas storage capacity of almost 180 Bcf,²² which is more than enough capacity to balance the country's own seasonal swings in consumption. Azerbaijan has proposed importing natural gas from Russia or Iran in the spring and summer, generally the low demand period in the region. Azerbaijan plans to use the natural gas to fill storage and to increase enhanced oil recovery operations. Azerbaijan could also return some of the natural gas to Iran in the winter when northern Iran is often short of natural gas to cover peak demands.

Figure 7. Key oil and natural gas infrastructure in Azerbaijan



Table 2. Azerbaijan's natural gas export pipelines

Facility	Status	Capacity (billion cubic feet per year)	Total length (miles)	Origin	Destination	Details
South Caucasus Pipeline (SCP)	Operating	310	430	Shah Deniz field, Azerbaijan	Georgia and Turkey	First deliveries to Turkey in 2007; follows the route of the BTC oil pipeline from Azerbaijan, through Georgia, and connects to Turkey's domestic transmission pipeline system
South Caucasus Pipeline (expansion)	Under construction	565	430	Shah Deniz field (Stage 2), Azerbaijan	Georgia, Turkey, and southeast Europe	Expected to start operations in 2019; will connect to the Trans-Anatolian Pipeline (TANAP), which will cross Turkey, and to the Trans Adriatic Pipeline (TAP), which will run from the Turkish border to southeast Europe and Italy; both TANAP and TAP are also under construction
Hajiqabul (Gazi-Magomed)-Mozdok Pipeline	Operating	Bidirectional	460			Originally completed in 1983; in 2000 the town of Gazi-Magomed, Azerbaijan was renamed Hajiqabul
		460 (originally)		Russia	Azerbaijan	From 1983 to 2007, used to import Russian gas to Azerbaijan for domestic consumption
		175		Azerbaijan	Russia	From 2007 to 2014 used to export small volumes of gas to Russia
Hajiqabul (Gazi-Magomed)-Astara Pipeline	Operating	Bidirectional	170			Originally completed in 1972
		350 (originally)		Iran	Azerbaijan	Originally designed to carry Iranian gas to Azerbaijan and the Soviet Union; imports from Iran ended in 1979 with the Iranian revolution
		30–65		Azerbaijan	Iran	In 2006, Azerbaijan began supplying gas to Iran in exchange for Iran supplying gas to the Azerbaijan exclave of Nakhchivan
Iran-Nakhchivan Pipeline (Salmas-Nakhchivan)	Operating	15–65	65	Iran	Nakhchivan exclave, Azerbaijan	

Sources: U. S. Energy Information Administration, based on BP, IHS EDIN, Platt's *International Gas Report*, and *Cedigaz News Report*

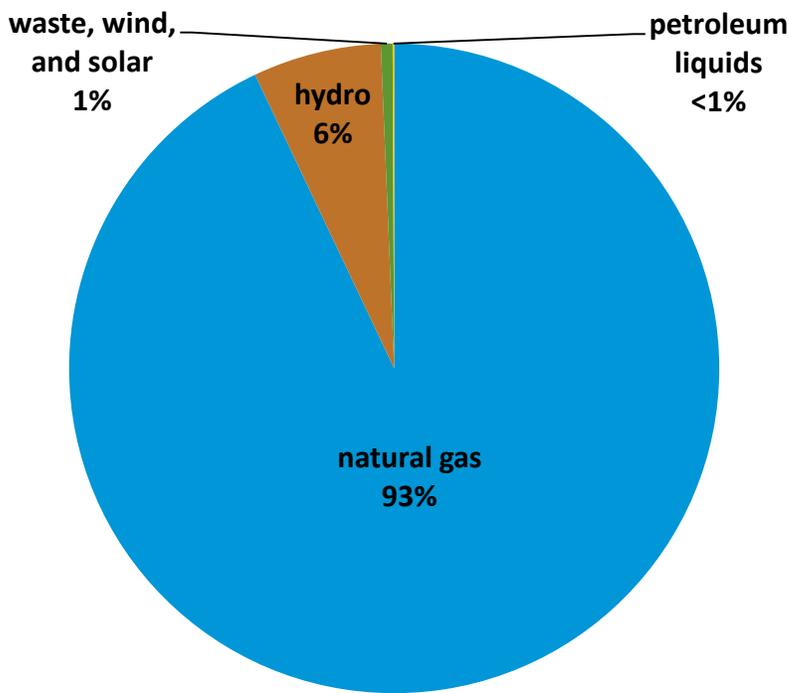
Electricity

Natural gas-fired generation accounts for most electric power produced in Azerbaijan. Hydropower accounts for most of the remainder.

Azerbaijan's electricity consumption grew to 21 billion kilowatthours in 2014, which was 7% above 2013 consumption.²³ More than 90% of Azerbaijan's electric power in 2013 came from natural gas-fired generation and less than 1% came from oil-fired generation (Figure 8).²⁴ Prior to 2008, oil-fired generation accounted for more than 10% of total electric output in Azerbaijan, but oil use in the electric sector has been reduced as equipment has been refurbished or replaced.

Hydropower is also a significant source of power generation, accounting for about 6% of total electric generation in 2013. In addition, the government of Azerbaijan is encouraging investment in generation from renewable energy sources in the country, and it has a few pilot and small-scale wind and solar facilities. In 2013, waste, wind, and solar combined accounted for about 1% of total electricity generation, with most of this generation coming from a power plant in Baku, Azerbaijan which opened in 2012 and burns municipal waste.

Figure 8. Azerbaijan electricity generation by fuel type, 2013



 Source: U.S. Energy Information Administration, based on International Energy Agency

Sector organization

Azerenerji is Azerbaijan's state power utility, and it is responsible for generation, dispatch, and transmission of electric power. Azerenerji, along with the Nakhchivan Energy Authority, operates most of the country's power stations, including 5 gigawatt electric (GWe) of thermal power stations and 1.1

GWe of hydropower stations.²⁵ A much smaller amount of generation capacity is operated by the State Agency for Alternative and Renewable Sources and by independent power producers.

There is no competition in Azerbaijan's power sector. Electricity prices are regulated, and power generators are required to supply their power to the central dispatch system for transmission and distribution.

Notes

- Data presented in the text are the most recent available as of June 22, 2016.
- Data are EIA estimates unless otherwise noted.

¹ International Energy Agency, [Energy Balances of Non-OECD Countries](#), 2015 edition.

² State Oil Fund of the Republic of Azerbaijan, [SOFAZ Revenue and Expenditure Statement for January-December 2014](#) and [SOFAZ revenue and expenditure Statement for January-December 2015](#)

³ *Oil & Gas Journal*, "Worldwide Look at Reserves and Production," (December 7, 2015), p. 22.

⁴ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed March 29, 2016).

⁵ SOCAR, [Economics & Statistics: Oil Production](#), (accessed March 29, 2016).

⁶ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed March 29, 2016).

⁷ BP, "Year end results," [2009, 2010, 2011, 2013, 2014, and 2015](#); and "BP in Azerbaijan Sustainability Report 2012," (accessed March 29, 2016), p. 7.

⁸ BP, [Azeri-Chirag-Deepwater Gunashli](#), (accessed March 29, 2016).

⁹ BP, [Shah Deniz](#), (accessed March 18, 2016).

¹⁰ BP, [Azeri \(BTC\)](#), (accessed March 29, 2016).

¹¹ BP, [Azeri light \(Supsa\)](#), (accessed March 29, 2016).

¹² The State Statistical Committee of the Republic of Azerbaijan, [Energetics: Commodity balance of crude oil](#), (accessed March 9, 2016).

¹³ SOCAR, [Baku-Novorossiysk oil pipeline](#), (accessed March 29, 2016); BP, [Baku-Tbilisi-Ceyhan pipeline](#), (accessed March 29, 2016); and BP, [Western Route Export Pipeline](#), (accessed March 29, 2016).

¹⁴ BP, [Baku-Tbilisi-Ceyhan pipeline](#), (accessed March 29, 2016).

¹⁵ *Oil & Gas Journal*, "Worldwide Refineries—Capacities as of January 1, 2016," (December 7, 2015), p. 2

¹⁶ KBR Press release, [KBR Joint Venture Awarded Important Project Management Contract for Baku Oil Refinery Modernization](#), (March 8, 2016).

¹⁷ SOCAR, "[Fluor selected as SOCAR's project management contractor](#)," (March 30, 2015).

¹⁸ *Oil & Gas Journal*, "Worldwide Look at Reserves and Production," (December 7, 2015), p. 22.

¹⁹ BP, [Shah Deniz](#), (accessed March 18, 2016).

²⁰ BP, [South Caucasus pipeline](#), (accessed March 29, 2016); IHS EDIN; Rodova, Nadia, "Central Asia fills Gazprom's short-term needs," *Platt's International Gas Report*, issue 640, (January 18, 2010), p. 6; and Cedigaz News Report, "AZERBAIJAN: SOCAR modernizes infrastructure to increase gas supplies to Iran," vol. 49, no. 2 (January 25, 2010), p. 9.

²¹ BP, Shah Deniz, [Frequently asked questions](#), (accessed March 29, 2016).

²² "[SOCAR: 2.7 Bcm gas injected to gas storage facilities](#)," Natural Gas Europe, (December 25th, 2015).

²³ [The State Statistical Committee of the Republic of Azerbaijan](#), Energetics: Consumption of electricity, (accessed March 9, 2016).

²⁴ International Energy Agency (IEA), [Energy Balances of Non-OECD Countries, 2015 Edition](#).

²⁵ Azerenerji, [Energy production](#), (accessed March 9, 2016)