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Azerbaijan Energy Profile

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Azerbaijan Energy Profile

Country overview

The Republic of Azerbaijan (Azerbaijan) is in the southern Caucasus region, bordered by the Caspian Sea to the east, Armenia and Georgia to the west, the Russian Federation (hereafter, “Russia”) to the north, and Iran to the south. Its population of 10.1 million occupies approximately 86 600 square kilometres; Baku is the capital and the largest city.

Azerbaijan has undergone significant economic transformation since its independence in 1991, with its large oil and gas reserves pushing it to strong growth in the 1990s and 2000s. However, heavy dependence on extractive industries has left Azerbaijan exposed to the negative effects of oil price volatility.

From 2013-17, growth in gross domestic product (GDP) averaged 1.4% per year, down from 5.5% during 2008-12. The country’s hydrocarbon sector was responsible for the bulk of the decline, as it contributes roughly a third of GDP and makes up over 90% of total exports. The 2014 decline in global oil prices and the ensuing decline in oil production pushed this contraction. In addition, the oil price drop led to a decline in remittances from Azerbaijan’s hydrocarbon-rich trading partners. These remittances, the bulk of which support the country’s rural population, fell by one-third. In 2017, Azerbaijan’s GDP barely saw any growth, but 2018 saw an increase of 1.4% (www.adb.org/sites/default/files/linked-documents/LD1%20ISGA.pdf).

Azerbaijan's GDP grew by 2.3% in 2019 and is expected to fall to -2.2% in 2020 due to the outbreak of Covid-19 and increase to 0.7% in 2021, according to updated International Monetary Fund (IMF) forecasts from 14 April 2020.

Oil and gas account for more than 90% of Azerbaijan’s exports. Oil and gas production increased considerably in the 2000s, following discovery of the Shah Deniz gas field, to reach record levels in 2010. The government and international companies have invested substantially in the energy sector, and the construction of several new power plants as well as rehabilitation and modernisation of the gas and electricity networks have improved reliability and security of supply.

Azerbaijan has strong potential for renewable energy development. The country has excellent solar and wind resources and significant prospects for biomass, geothermal and hydropower. Practical deployment has been limited, however, compared with the scale of the country's available resources and long-term ambitions.

Renewables also offer the most prominent low-carbon solution to meeting Azerbaijan's climate targets. The country has committed to reducing its greenhouse gas (GHG) emissions by 35% by 2030, measured from the 1990 base year set in its nationally determined contribution (NDC) under the Paris Agreement, which emphasises the use of alternative and renewable energy sources to achieve this target.

Despite widespread privatisation of the economy since the country gained its independence, the energy sector in Azerbaijan remains predominantly government-owned. Only a handful of small hydropower plants are in private ownership, and they account for less than 1% of electricity generation.

Table 1 Annual oil, natural gas and electricity production in Azerbaijan

		2010	2011	2012	2013	2014	2015	2016	2017	2018	2019*
Oil (including NGLs)	Mt	50.9	45.7	43.4	43.5	42.1	41.7	41.1	38.7	38.8	37.5
Natural gas (marketable)	bcm	16.7	16.3	17.7	18.3	19.3	19.2	18.7	18.2	19.2	24.5
Electricity	TWh	18.7	20.3	23.0	23.4	24.7	24.7	25.0	24.3	25.2	26.1

* Provisional data
Notes: NGLs = natural gas liquids; Mt = million tonnes; bcm = billion cubic metres; TWh = terawatt-hours.
Source: Data provided to the IEA by the State Statistical Committee of the Republic of Azerbaijan (SSC).

Key energy data

Supply

- Azerbaijan's energy demand (measured by total primary energy supply [TPES]) was 14.4 million tonnes of oil equivalent (Mtoe) in 2018, which is roughly equal to that of Ireland.
- Azerbaijan is a major crude oil producer (37.5 Mt including natural gas liquids in 2019) and a significant producer of natural gas (24.5 bcm in 2019).

- Azerbaijan was the 24th-largest crude oil producer in the world in 2018 and the second among EU4Energy focus countries after Kazakhstan.
- Because of this large hydrocarbon production, it has one of the highest energy self-sufficiency ratios in the world: its energy production is more than four times its energy demand.
- Azerbaijan generates 26 TWh of electricity annually, mostly from natural gas (more than 90 % in 2019).
- Azerbaijan's sole refinery produces 5.8 Mt of oil products from domestic crude oil and NGLs.

Import and export

- Azerbaijan is also a major exporter of crude oil (30.8 Mt in 2019) and natural gas (11 bcm in 2019).

Demand

- In 2018, Azerbaijan's total final consumption (TFC) (excludes transformation sector) was 9.2 Mtoe.
- The residential sector is the largest final consumer (3.3 Mtoe in 2018).
- Transport is the second-largest final-energy-consuming sector (2.7 Mtoe in 2018). Most oil products consumed in the transport sector are produced in Azerbaijan.
- Despite natural gas having the largest share in the TPES, oil is the main fuel in TFC with a 45% share in 2018. This is because most natural gas is consumed to generate electricity and heat.

Renewables

- Renewables, including hydro, contributed 2% to total primary energy supply and 8% (2 TWh) to electricity supply in 2018.

Energy sector governance

The presidential administration, Cabinet of Ministers and Ministry of Energy are the main government institutions involved in the energy sector, while the State Oil Company of Azerbaijan Republic (SOCAR), Azerenergy (Azerenerji in Azerbaijani), Azerishiq and Azeristiliktejhizat are the main state-owned energy companies.

Executive

Executive power of the Republic of Azerbaijan is held by the **president of the Republic of Azerbaijan** (www.president.az), and the president assembles a **Cabinet of Ministers** to organise the work of the executive authorities. The Cabinet of Ministers is a superior executive body accountable directly to the president (www.cabmin.gov.az).

The **Ministry of Energy** is the central executive authority responsible for implementing state policy and the various regulations, orders and decrees issued by the government for the energy sector. The ministry board, approved by the Cabinet of Ministers, has the authority to issue orders within its area of competence, meaning most areas within the energy sector except tariff regulation, which is under the authority of the energy regulator, the Tariff (Price) Council (www.minenergy.gov.az).

The **Tariff (Price) Council** is the collegial executive body designated to implement the state regulation of tariffs, service fees and collections ("prices") to which state regulation is applied. Its creation was confirmed by Decree No. 341 of December 2005, the Statute on Tariff (Price) Council of the Azerbaijan Republic, to meet the requirements of Decree No. 242 on Strengthening of Anti-inflationary Measures in the Azerbaijan Republic of May 2005 (Clause 4.2).

The Minister of Economy is the chairman of the Tariff (Price) Council, and council members are the deputy ministers of Finance, Taxes, Justice, Energy, Transport, Communication and Information Technologies, Agriculture, Health, Education, Labour, and Social Defence of the People; and the vice-chairmen of the committees of Customs, and of State City Building and Architecture (www.tariffcouncil.gov.az).

In 2017, the president of Azerbaijan signed a decree establishing the **Energy Regulatory Agency** under the Ministry of Energy. The agency will carry out the regulation of relationships among producers, transmission system operators and distributors, and suppliers as well as customers in the field of electricity, heat and gas supply. The agency's main activities include state supervision of quality control, analysis and the introduction of incentives for attracting investment. Eventually, after the approval of the draft Law on the Regulator, all functions related to the calculation and approval of energy tariffs will be transferred from the Tariff Council to the agency. The draft law was submitted to the Cabinet of Ministries for inter-ministerial consultations in July 2019.

The **Ministry of Ecology and Natural Resources** is a central executive body implementing state policy on environmental protection; it organises the effective use of natural resources and their rehabilitation. The ministry maintains environmental safety, taking measures to avert any possible damage to natural ecological systems from economic or other activities (www.eco.gov.az).

The **State Agency on Alternative and Renewable Energy Sources (SAARES)** was established by a presidential decree on 16 July 2009, and was subsequently tasked with driving the development of the country's renewable energy resources and related projects. The status of the agency was altered by presidential decree No. 464 of 14 January 2019 making it part of the Ministry of Energy, to which the Agency's activities were partially transferred.

Legislative

The Azerbaijani legal system is based on civil law. The Constitution has the greatest legal force in the country and is the foundation of the legislative system. The legislative system consists of the following normative legal acts:

- the Constitution
- acts accepted by referendum
- laws
- orders
- decrees of the Cabinet of Ministers
- normative acts of central executive bodies.

International agreements wherein Azerbaijan is one of the parties constitute an integral part of the legislative system. When there is disagreement between normative legal acts (except within the Constitution and acts accepted by way of referendum) and international agreements wherein Azerbaijan is one of the parties, provisions of the international agreement take precedence.

The legislative body of Azerbaijan is the National Assembly (Milli Məclis in Azerbaijani), a unicameral parliament whose 125 deputies are elected by direct election for a term of five years (citizens are eligible to vote at age 18 and to run for National Assembly at 25). The most recent elections for the National Assembly were held in February 2020 after parliament was dissolved in December 2019 (www.meclis.gov.az).

Under the Constitution, those having the right to submit drafts of laws and other questions for consideration by the National Assembly are: deputies of the National Assembly, the president of the Azerbaijan Republic, the Supreme Court, citizens' groups presenting at least 40 000 signatures, the Prosecutor's Office and the National Assembly (Ali Majlis) of the Nakhichevan Autonomous Republic.

Drafts of laws are submitted to the president for signing within 14 days of their acceptance. If not specified otherwise in the law or the decree of the National Assembly, the law and decree become valid from the date of their publication.

A number of laws regulating oil and gas extraction have been adopted since Azerbaijan gained its independence:

- the Law on Use of Energy Resources of May 1996
- the Law on Subsoil of February 1998
- the Law on Gas Supply of June 1998
- the Law on Energy of November 1998 (the Energy Law).

Two basic regulatory regimes apply to oil and gas exploration and production in Azerbaijan: the regulatory regime established under the Law on Energy and implemented through energy contracts, and regimes particular to each case established by specific production sharing agreements (PSAs).

PSAs grant contractors the sole and exclusive right to conduct upstream oil and gas operations in the area specified in the PSA. PSAs also determine the participatory interests of the contractors and the specific conditions and terms under which the operations must be conducted. They therefore typically define the warranties, general rights and obligations of the parties, the scope of the work, and the procedures and rules for managing and implementing the oil and gas operations. The terms of PSAs vary, although they usually last about 30 years. This period can be extended with the consent of SOCAR.

Judiciary

The juridical system in Azerbaijan comprises the Constitutional Court, the Supreme Court and the High Economic Court, as well as district and municipal courts invested with general jurisdiction, including over commercial disputes.

The Supreme Court is the highest judicial body in civil, criminal, administrative and other cases referred by the general courts, and exercises general control over the

activity of first-instance courts. However, appeals for economic disputes go to the High Economic Court, which is the highest appellate body for such matters.

Under the 1992 Law on Foreign Investment, foreign investors have the right to international arbitration of commercial and investment disputes with Azerbaijani state authorities or other entities only if the parties have agreed to arbitration. Under this law, foreign states, their legal entities and citizens, and international organisations engaging in investment activities in Azerbaijan are treated as foreign investors.

Azerbaijani law recognises the right of parties to refer a dispute to arbitration in another country or to a tribunal in Azerbaijan that will apply foreign law. The Law on International Arbitration of November 1999 (the International Arbitration Law) and the Civil Procedure Code of Azerbaijan, effective September 2000, govern the enforcement of awards issued by an international commercial arbitration tribunal and other related issues. Additionally, in 1992 Azerbaijan acceded to the Washington Convention on the Settlement of Investment Disputes between States and Nationals of Other States that provides for arbitration at the International Centre for Settlement of Investment Disputes. In 1996 the country acceded to the European Convention on Foreign Commercial Arbitration, and in 2000 it acceded to the New York Convention on the Recognition and Enforcement of Foreign Arbitral Awards (www.bakermckenzie.com).

Regulatory framework

Azerbaijan does not have an independent energy regulator. In 2017, the president of Azerbaijan signed a decree on the establishment of an Energy Regulatory Agency under the Ministry of Energy. Licensing procedures are regulated by the Ministry of Economy, while tariffs are set by the Tariff (Price) Council, chaired by the Minister of Economy.

Under the Subsoil Law, no person or legal entity may engage in oil or gas exploration and production without a licence (i.e. an activity permit for a particular area). The law clarifies that a production licence must be issued for a particular subsoil block and is the ultimate deed granting subsoil use rights in that block.

An exploration licence can be issued for a term of up to 5 years, a production licence for up to 25 years, and a combined exploration and production licence for up to 30 years. An extension can be granted for a term agreed between the subsoil user and the licensing authority.

Unlike the Subsoil Law, the Energy Law grants production rights for a specified block exclusively on the basis of an energy contract. Notwithstanding the regimes set out in the Subsoil and Energy laws – and underlining the strategic importance of oil to the country – most major oil deals in Azerbaijan are approved by the country's legislature. In the absence of a PSA law and a law on petroleum, every oil deal in the form of a PSA – the main form of oil agreement in Azerbaijan – is considered to legally prevail over any conflicting law (arguably everything except the Constitution, acts adopted by public referenda and international agreements).

Tariffs

The Tariff (Price) Council establishes tariff methodology, reviews the tariffs proposed by regulated companies (including but not limited to energy) and proposes changes to the legal framework related to pricing. It also is responsible for dispute settlements concerning price regulation and application.

Electricity tariffs subject to state regulation include purchases by producers, wholesale and retail sales, and import/export transactions. The Law on Electricity stipulates that tariffs cover the full cost of generation, transportation and distribution, and ensure the profitability of power enterprises. The electricity sector is almost entirely state controlled, and separate prices for wholesale electricity, transmission and distribution are assigned.

Table 2 Electricity tariffs in Azerbaijan

No.	Service	Tariff (VAT included, qapik per kWh)
1.	From producer	
1.1	For small hydropower stations	5.0
1.2	Wind	5.5
1.3	Other alternative and renewable resources	5.7
2.	Wholesale	5.7
2.1	Chemistry and aluminium industry, steel production enterprises with monthly electricity consumption not less than 5 million kilowatts/hour	
2.1.1.	Daytime (08:00-22:00)	5.8
2.1.2.	Night time (22:00-08:00)	2.8

No.	Service	Tariff (VAT included, qapik per kWh)
3.	Transit	0.2
4.	Retail	
4.1	Population	
4.1.1.	Monthly consumption up to 300 kilowatts/hour	7.0
4.1.2.	If monthly consumption is more than 300 kilowatts/hour	11.0
4.2	Non-residential	9.0

Note: USD 1 = 1.70 Azerbaijan manat (AZN); VAT = value-added tax; kWh = kilowatt-hour; qapik = 1/100 manat
Source: Tariff (Price) Council.

There are no feed-in tariff incentives or special tariffs for foreign investors, although a feed-in tariff is included in the draft Law on Renewables.

Government bodies may modify decisions made by the Tariff (Price) Council, when this right is granted by legislation, and regulatory decisions may also be overturned by court ruling. Energy companies may appeal decisions of the Tariff (Price) Council, either directly to the council or through court action.

Table 3 Natural gas tariffs in Azerbaijan

No.	Service	Tariff (VAT included, AZN/ thousand m^3)
1.	Natural gas processing	5.5
2.	Transportation of natural gas (per 100 km)	2.0
3.	Wholesale price of natural gas to the distributors	75.0
4.	Retail price of natural gas	
4.1.	Population	
4.1.1.	Annual consumption up to 2 200 m^3	100.0
4.1.2.	If annual consumption exceeds 2 200 m^3	200.0
4.2	Non-residential	200.0
5.	For electricity producers that consume natural gas for production purposes (If monthly consumption is not less than 10 million m^3)	120.0

Note: USD 1 = AZN 1.70; m^3 = cubic metre; km = kilometre.
Source: Tariff (Price) Council.

Metering and collection

All electricity and natural gas consumption is metered in Azerbaijan. Metering systems comply fully with international standards, and distribution entities own all end-user meters. Electricity and natural gas tariffs for households and most commercial entities are differentiated.

Azerenergy's programme for widespread installation of prepaid meters was taken over by Azerishiq in 2015 and is ongoing, with all consumers expected to be equipped with smart meters in the near future. Around 20% of the company's 1.5 million customers have prepaid smart meters that improve tracking of consumption and prevent illegal connections, and collection rates have improved significantly: more than 93% for electricity and 100% for gas in 2018.

Cross-border flows are operated and metered by Azerenergy for electricity and by SOCAR for oil and gas. Metering on both sides is done electronically: both parties submit readings, reconcile the data, and prepare and verify metering reports. Bilateral agreements govern the transactions, and a working committee carries out investigations and resolves conflicts in data discrepancies.

Technical rules

The governmental standards (GOST) of the former Soviet Union are still in use in both the electricity and gas sectors in Azerbaijan. Azerbaijan is represented in international and regional standardisation organisations:

- the International Organization for Standardization (ISO) (member)
- the European Committee for Standardization (affiliate)
- the Interstate Council for Standardization, Metrology and Certification of the Commonwealth of Independent States of the Euro-Asian Council for Standardization, Metrology and Certification.

The reform agenda includes a national plan for converting mandatory standards to technical regulations and voluntary standards, a draft law on technical regulations, and draft laws on standardisation and accreditation.

Azerbaijan's accession to the World Trade Organization (WTO) involves significant trade policy reforms. One of the key areas is standards and technical regulations: Azerbaijan particularly needs to ensure its compliance with the WTO Technical Barriers to Trade Agreement and is therefore in the process of reforms to guarantee harmonisation.

Key policies

The 2004 State Programme on the Development of the Fuel-Energy Complex for 2005-15, designed to support oil and gas developments and to ensure energy supply security, set out Azerbaijan's main energy policy. As part of the programme, the government invested in capacity building, rehabilitation and natural gas extraction to reduce electricity shortages and improve energy supply security.

As a result, since 2005 electricity production capacity has increased, electricity and gas losses have been reduced, and the country became a net exporter of gas with the opening of the Shah Deniz field.

Although the programme's term ended in 2015, there are plans for further field exploitations and capacity building. At the end of 2016, the government announced its Strategic Roadmap for the Development of Public Utility Services (electricity and thermal energy, water, and gas supply) covering Azerbaijan's 2016-20 development strategy, long-term outlook to 2025 and target vision after 2025. The roadmap was approved by the president in 2016 and updated through 17 July 2018. It sets several strategic targets, including for sustainability and efficiency.

Azerbaijan has significant untapped wind, solar, small hydro, biomass and geothermal potential. In 2004 the government adopted the State Strategy on the Use of Alternative and Renewable Energy Sources in Azerbaijan for 2012-20. A new legislative framework for the support of renewable energy sources is currently under preparation: the draft law "On using renewable energy sources in electricity production" will provide the legal basis for developing renewable energy projects in the country. The draft law envisages the introduction of auctions and tenders as support mechanisms. It also includes other draft legislative documents, including a draft of a power purchase agreement (PPA) and a connection agreement. In addition, rules on auctions and rules on net-metering/net-billing schemes application are also being drafted.

For energy efficiency there are no specific policies or incentive schemes, but the topic is addressed in the strategic roadmap. Furthermore, the draft Law on the Efficient Use of Energy Resources and Energy Efficiency is expected to be submitted by the president to the parliament in the near future. The government is also developing a National Energy Efficiency Action Plan (NEEAP).

Azerbaijan's State Commission on Climate Change was established in 1997, and the country has been in negotiations to accede to the WTO since that year. It

ratified the Kyoto Protocol in 2000, became a member of the International Renewable Energy Agency (IRENA) in 2009, and is a non-Annex I Party to the United Nations Framework Convention on Climate Change (UNFCCC). In 2016-17 Azerbaijan signed and ratified the Paris Agreement.

Energy statistics

The State Statistical Committee (SSC) is responsible for official energy statistics and balances in Azerbaijan. Energy data are collected through surveys on production, transformation and consumption, with a frequency ranging from monthly to annually, with respondents having the option of online forms. Data are broadly aligned with the international recommendations for energy statistics. Monthly data are available on large enterprise production, fuel stocks, aviation and marine bunkers, and energy distribution; households are surveyed on an annual basis. Survey data are complemented by administrative data, and the SSC has access to monthly trade data from the State Customs Committee, as well as business registers and other enterprise surveys.

The SSC publishes *Energy of Azerbaijan* every year, dedicated to energy statistics. The publication is available free of charge in PDF format. Data are also available on the statistics website in electronic format with the possibility of creating charts, excel files and PDFs from the selection. Metadata are available in Azerbaijani.

Azerbaijan disseminates annual energy data internationally by sharing data with the United Nations Statistics Division (UNSD) and the International Energy Agency (IEA) through the joint United Nations Economic Commission for Europe (UNECE)/IEA/Eurostat annual questionnaires. Azerbaijan participates in the Joint Organisations Data Initiative (JODI) for oil and gas via the UNSD, contributing to the transparency of global monthly oil and gas data.

The SSC has established solid links with data providers and data users, among them the former SAARES, now part of the Ministry of Energy.

Azerbaijan was the first country of the Former Soviet Union to publish an energy balance according to the International Recommendations of Energy Statistics, and has done major work on methodological issues, including a full review of calorific values with the National Academy of Sciences (2011); an end use-consumption survey in households was conducted in 2017. It has hosted both Oslo Group (2013) and JODI meetings (2014), and development of a data set of energy efficiency indicators is planned

Chapter 1. Energy security

Oil and gas resources

Azerbaijan is rich in oil and natural gas resources. At the end of 2017, its oil reserves of 7 billion barrels (1 Mt) accounted for 0.4% of global reserves, according to the June 2018 BP *Statistical Review of World Energy*. Oil is produced both onshore and offshore in the Caspian Sea, with offshore production accounting for about one-quarter of the total (www.minenergy.gov.az, 2015).

The Azeri-Chirag-Deepwater Gunashli (ACG) field, located about 100 km east of Baku, is the largest oilfield in the Azerbaijan sector of the Caspian Basin. Discovered in the early 1970s when Azerbaijan was part of the Soviet Union, it comprises a series of individual reservoir horizons located 2 000 metres to 3 500 metres beneath the Caspian seabed. A PSA was signed in Baku in September 1994 by the Government of Azerbaijan and a consortium of 11 foreign oil companies.

Azerbaijan has an estimated 1.3 trillion cubic metres of proven natural gas reserves, and according to the operator (BP), the Shah Deniz gas field is one of the world's largest at more than 1 000 bcm. While Azerbaijan is not as large a figure in global gas as it is in oil, gas extraction is expected to continue contributing significantly to the economy in the coming decades.

Energy security and diversification

The country's energy mix is heavily concentrated on fossil fuels, with oil and gas accounting for more than 98% of total supply. While supply security is not a concern, heavy reliance on fossil fuels elevates GHG emissions and exposes the country to fuel price fluctuation risks. In addition, although ageing natural gas networks have been significantly modernised with new compressor stations and ancillary infrastructure, distribution system losses and quality of gas supply remain concerns.

Electricity generation is dominated by natural gas (90%), while large hydro generates 8%. Electricity supply security improved over the 2007-17 decade with modernisation of the generation system and strengthening of the west-east

transmission network; additional gas-fired generation capacity has reduced the frequency of electricity shortages, and the hydropower projects also made shortages less common. As resource-related income has boosted the growth of the middle class, demand for electricity has increased, making further capacity additions necessary.

The State Strategy on the Use of Alternative and Renewable Energy Sources in Azerbaijan for 2012-20 provided key directions for the production of electricity and heat from renewables. To date, the focus in renewable energy has been on small hydro and wind power, with more than 300 megawatts (MW) of new renewables capacity in planning or development. According to the 2016 Strategic Roadmap, the government plans to diversify energy portfolio of the country and to create an additional total 420 MW of renewable generation capacity, with 350 MW of wind, 50 MW of solar and 20 MW of biomass capacity.

Energy infrastructure and investment

Electricity

Along with the oil and gas sector, the electricity sector plays a leading role in Azerbaijan's social and economic development. Large investments in power generation and transmission since 2009 have resulted in remarkable improvements in the quality of power supply. Electricity generation is now sufficient to cover domestic demand, and the power system is capable of supplying electricity of acceptable quality to almost the entire population.

Azerbaijan has a total installed capacity of over 7.5 gigawatts (GW): 6.5 GW of oil- and gas-fired generation and 1.1 GW of hydro. In addition, the country has a small amount of wind, solar and other renewable generation (Table 1.4).

Table 4 Installed generation capacity by energy source (MW), 2014-18

Years	Plant capacity for the end of the year	Natural gas and oil	Hydropower	Wind	Solar	Solid domestic waste	Biogas
2014	7 353.4	6 233.4	1 077.9	2.7	2.4	37.0	-
2015	7 806.7	6 652.8	1 103.4	7.7	4.8	37.0	1.0
2016	7 910.4	6 726.8	1 105.0	15.7	24.9	37.0	1.0
2017	7 941.5	6 748.0	1 106.4	15.7	28.4	42.0	1.0
2018	7 828.9	6 552.2	1 130.8	66.0	34.9	44.0	1.0

Source: SSC.

Investment in new gas-fired generation capacity in the electricity sector has been notable, with capacity increasing by around 2 GW since 2005. In 2013, the 780 MW Janub power plant in Shirvan was commissioned. The construction of the Shimal-2 power plant was completed in 2019, adding another 400 MW into the system. Also, the 36 MW Ordubad hydropower plant in the Nakhchivan Autonomous Republic is under construction and measures are being taken to build a 385 MW modular power plant in the Gobu district.

The power network includes 70 high-voltage substations and over 7 600 km of lines (Table 1.5).

Table 5 Electricity transmission and distribution network, 2018

Voltage Level (kV)	Lines		Substations	
	Number	Length (km)	Number	Capacity (MW)
110	189	4 325	70	5 335
220	29	1 505	13	5 223
230	1	31	-	-
330	24	1 542	8	3 745
500	3	477	2	2 667

Note: kV = kilovolt.
Source: www.azerenergy.gov.az.

In 2019, electricity generation reached 26 TWh, up 3.3% from 2018. Of this, 92.7% came from thermal power plants and 7.3% from other sources, mainly hydropower plants.

Azerbaijan has been exporting electricity since 2007. In 2019, it exported around 1.5 TWh to Georgia, Russia and Turkey. The transmission capacity with Russia is around 350 MW.

With Georgia, Azerbaijan has two cross-border connections: the 500 kV Samukh-Gardabani (650 MW of export capacity to Georgia and to Turkey via transit) and the 330 kV Agstafa-Gardabani line.

With Iran, Azerbaijan has five cross-border connections: 330 kV Mugan, 230 kV Imishli and 110 kV Astara-Astara, owned by Azerenergy open joint stock company (OJSC); and 132 kV Araz-Araz and 132 kV Julfa-Julfa lines, owned by Nakhichevan State Energy Service. The current cross-border capacity is 600 MW (http://minenergy.gov.az/en/elektroenergetika/mustegillik-elde-edildikden-sonra-elektroenergetikanin-inkisafi1991-ciilden-sonraki-ucuncu-dovr). In co-operation with Iran, two hydropower plants are being constructed: the 200 MW (100 MW for each side) Khudaferin and the 80 MW (40 MW for each side) Maiden Tower.

With Turkey, Azerbaijan has three cross-border connections: the 154 kV Igdir-Nakhchivan 1, the 154 kV Igdir-Nakhchivan 2 and the 34.5 kV Sadarak.

As Azerbaijan is at the centre of the Trans-Caucasus interconnected power system, and has a relatively long distance between its generation and load centres, it necessitates a backbone of large transmission lines. In recent years, Azerbaijan has modernised transmission and distribution facilities and managed to reduce outages and network losses to less than 10% of the total generation (Table 1.6).

Table 6 Electricity losses in transmission and distribution networks, 2018

Network	TWh
Total technical losses	2.22
Transmission	0.36
Distribution	1.85

Source: SSC.

Oil

Azerbaijan has three crude oil export pipelines. About 80% of the country's oil is exported through the Baku-Tbilisi-Ceyhan (BTC) pipeline, which began operations in 2006 and has a capacity of 1.2 million barrels per day. It transports crude oil produced at the ACG field as well as condensate produced at Shah Deniz from the Sangachal terminal near Baku through Georgia to the Mediterranean port of Ceyhan in Turkey; from there the oil is shipped by tanker to world markets. The BTC pipeline is 1 768 km long, with 443 km in Azerbaijan, 249 km in Georgia and 1 076 km in Turkey. As it has ample free capacity, it also transports some Turkmen and Kazak oil (www.bp.com/en_az/caspian/).

The Baku-Novorossiysk pipeline runs from the Sangachal terminal on the Caspian Sea to the Novorossiysk terminal on the Black Sea in Russia. It is 1 330 km long with a capacity of 105 000 barrels per day (b/d) and has been operating since 1996; SOCAR operates the Azerbaijani section and Transneft operates the Russian section. Despite proposals to increase the pipeline's capacity, which would be a key transportation addition as production expands in the Caspian Sea, operation of the pipeline was halted in 2014 and resumed in 2015 at lower loading levels.

The Baku-Supsa pipeline transports crude oil from offshore oilfields in the Caspian Sea to Supsa, Georgia, on the Black Sea where it continues to European markets via tankers. It is 833 km long with a capacity of 145 000 b/d and has been in operation since 1999 http://socar.az/socar/en/activities/transportation/baku-supsa-western-export-pipeline

Natural gas

Azerbaijan became a net exporter of natural gas in 2007 with the start-up of the huge Shah Deniz natural gas and condensate field; before then it imported gas from Russia.

The country has two main gas export pipelines. The largest is the South Caucasus Pipeline (SCP) that transports gas from the Shah Deniz field through Georgia to Turkey parallel to the BTC crude oil pipeline. The SCP is 693 km long (443 km in Azerbaijan and 250 km in Georgia) and has a capacity of 7 bcm.

The second export pipeline is the Hajigabul - Mozdok, which transported natural gas from Russia to Azerbaijan until 2007 when an agreement between SOCAR and Gazprom allowed the pipeline's flow to be reversed, and gas exports to Russia

began in 2010. The pipeline has an annual capacity of 10 bcm. It is 680 km long, 200 km of which is in the territory of Azerbaijan. The operators of this pipeline are SOCAR and Gazprom (Russia). (http://minenergy.gov.az/en/qaz/cenubi-qafqaz-boru-kemeri-cqbk).

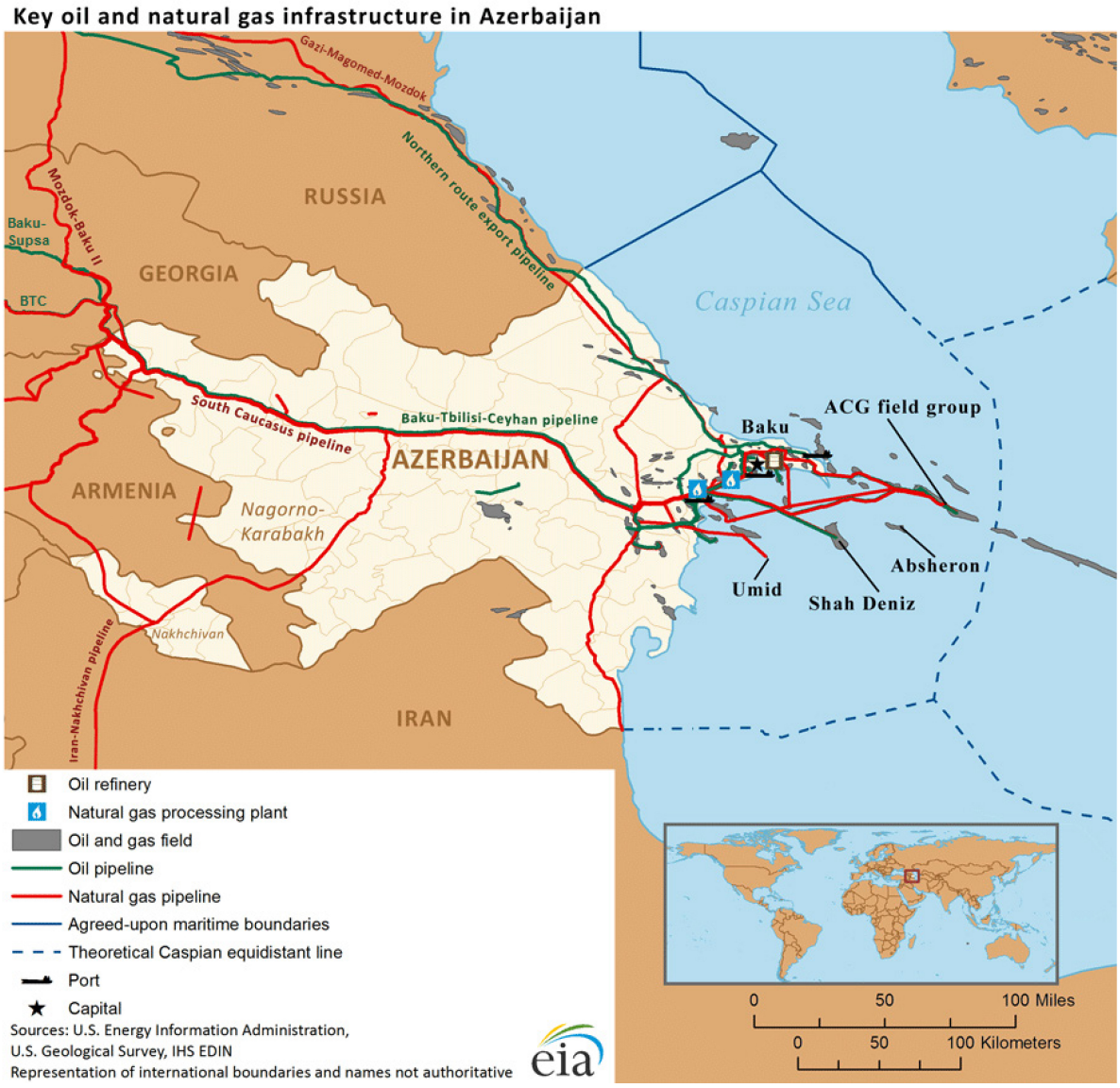
Shah Deniz I is producing around 9 bcm/year. Shah Deniz II began producing in mid-2018 and the volume is expected to increase to 4 bcm in 2020 and 6 bcm in 2021, eventually rising to 16 bcm per year.

Shah Deniz II and the SCP pipeline are key parts of the Southern Gas Corridor infrastructure project to deliver Caspian gas to the EU. The other parts are the Trans-Anatolian Pipeline (TANAP) crossing Turkey to Greece and the Trans-Adriatic Pipeline (TAP) from Greece via Albania to Italy. TANAP was officially brought online in Turkey In June 2018 and TAP is expected to be commissioned in late 2020.

TANAP has potential to expand to 24-31 bcm/year, while TAP will have an initial capacity of 10 bcm per year. The Southern Gas Corridor is a joint project of several major international companies, including SOCAR.

Azerbaijan has two underground gas storage facilities: Kalmaz and Garadag, both located at Garadag. Gas is supplied by the Gazi-Mammad-Baku pipeline, and total storage capacity is around 3.5 bcm (Kalmaz 1.5 bcm and Garadag 2 bcm). There are plans to expand capacity of underground gas storage facilities to 5 bcm (Figure 1).

Figure 1 Key oil and natural gas infrastructure in Azerbaijan



Emergency response

Established in 2005, the Ministry of Emergency Situations is responsible for emergency response mechanisms in all sectors of the economy. Its mandate includes natural and human-caused disasters and fire, as well as emergency situations involving power system incidents, utility systems, hydropower facilities, oil and gas production and processing facilities and main pipelines. It provides policy measures in the fields of civil defence, rescue and restoration works (www.fhn.gov.az).

Chapter 2. Market design

National market structure

Electricity

Azerbaijan's electricity market is dominated by state-owned vertically integrated monopolies has eliminated all competition. The government owns and manages the energy sector, and is committed to sectoral reform with the aim of improving system efficiency, supply reliability and transparency. As a first step to reform, all power distribution assets and functions were entirely separated from the state-owned company Azerenergy (Azerenerji OJSC) and transferred to another state-owned company, Azerishiq OJSC (formerly Bakielektrikshebeke OJSC, i.e. Baku Electric Company), in 2015.

As the largest electricity provider, Azerenergy owns and operates most generation assets including gas-fired, oil-fired and hydro plants, and is the transmission system operator (TSO).

Azerishiq OJSC is the 100% state-owned enterprise responsible for electricity distribution, supply and other customer services (connection, metering and billing), except in the Nakhchivan Autonomous Republic, which is directly administered by its own state energy agency. Azerishiq administers the seven regional distribution networks of Aran, Baku, Canub, Garb, Markazi Aran, Shimal and Shimal Garb (www.azerishiq.az).

In the Nakhchivan Autonomous Republic, the Nakhchivan Energy Authority is the state-owned TSO and distribution system operator, and carries out dispatch operations. Existing legislation envisages unbundling of the electricity sector, but no implementation measures have been taken.

The Law on the Power Industry (1998) sets out some provisions for third-party access so that Azerenergy can purchase electricity from other producers, and other entities can buy electricity from Azerenergy (or other state companies) and sell it to end consumers. Alternatively, independent generators or industries can supply electricity to consumers on their own grids or through the state transmission system; these arrangements account for around 1% of electricity generation.

The government is considering to reform the electricity market. The 2016 Strategic Roadmap for the Development of Utilities (electricity, heat, water and gas) calls for a gradual transition to a liberal market model based on enhanced competition, unbundling, establishment of a wholesale market and expanding the share of renewables.

Taking into account the international experience, a draft Law on Electricity has been prepared. The draft law envisages a gradual market reform by 2025. The government plans to permit Independent generators to enter the sector and acquire existing power plants or build new ones. The possible privatisation of strategic assets may not adversely affect energy sustainability and security.

Electricity tariffs are set at AZN 0.07 per kilowatt-hour (kWh) (~USD 0.04/kWh) for consumers whose monthly consumption is under 300 kWh, and at AZN 0.11/kWh (~USD 0.06/kWh) for consumers using more than 300 kWh per month, i.e. 72% of consumers, according to the government.

Oil

SOCAR was created in September 1992 with the merger of Azerbaijan's two state oil companies, Azerineft State Concern and Azerneftkimiya Production Association. It is involved in exploring oil and gas fields; producing, processing and transporting oil, gas and gas condensate; marketing petroleum and petrochemical products in domestic and international markets; and supplying natural gas to industry and the public in Azerbaijan. Three production divisions, one oil refinery and one gas processing plant, a deepwater platform fabrication yard, two trusts, one institution, and 23 subdivisions operate as corporate entities under SOCAR.

Third-party access to pipelines is not permitted under existing legislation, and changes to the existing market structure are not envisaged.

Gas

SOCAR’s Azerigaz Production Union was established with the facilities and equipment of the Azerigaz Closed Joint Stock Company, in accordance with Decree No. 366 Concerning Improvements in Petroleum Industry Management Systems of July 2009. Six production divisions and organisations are consolidated within Azerigaz.

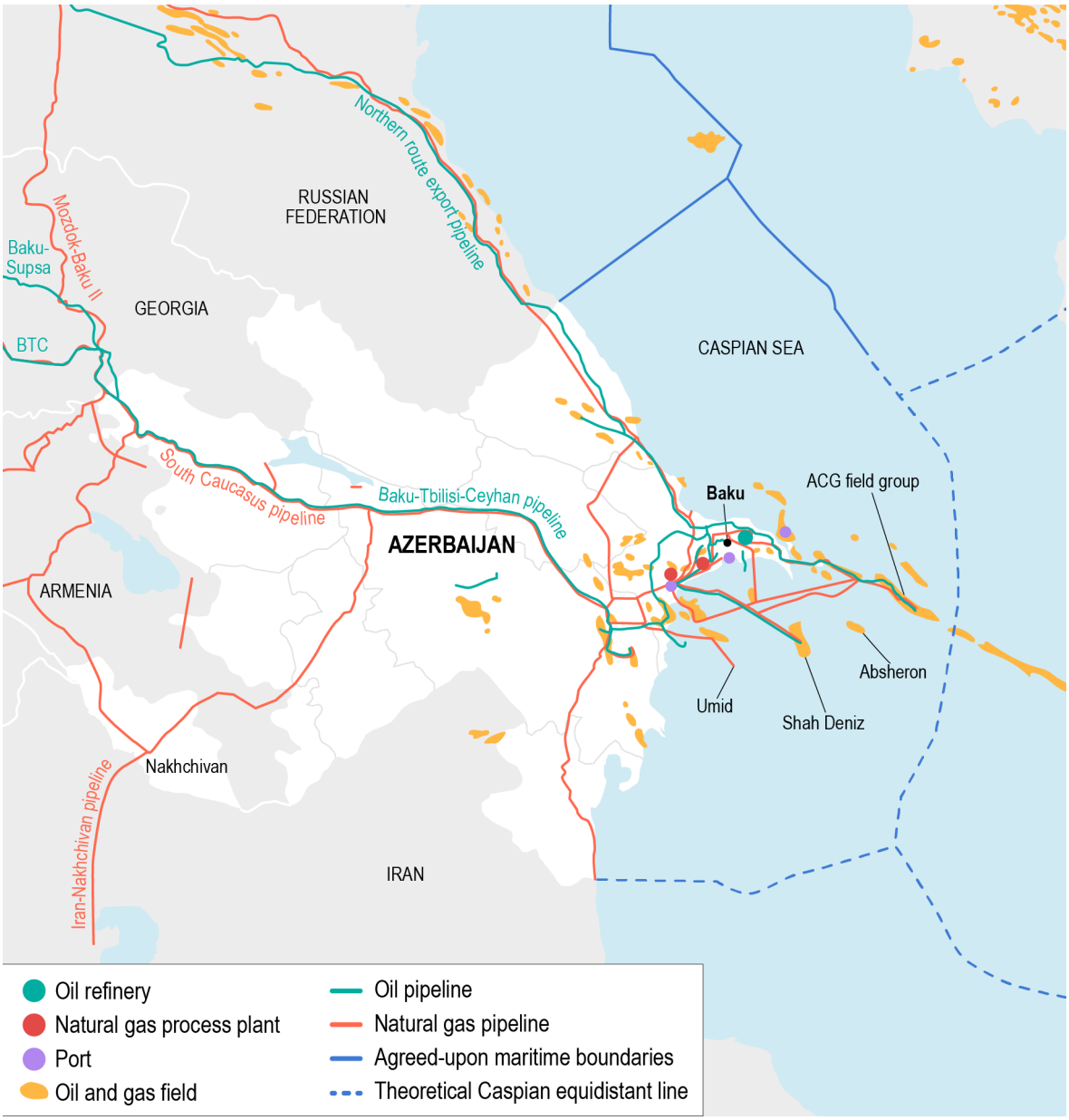
The company transmits, distributes and markets natural gas in Azerbaijan, and it also transports SOCAR gas to Georgia, Iran and Russia. Total gas transported annually by the company within and outside the country is 12.6 bcm. By supplying natural gas to all the country's fossil fuel power plants, Azerigaz plays a significant role in development of the country's electrical power industry.

The company can reach up to 1.3 million consumers in different parts of Azerbaijan. Its system for managing the gas supply network consists of 8 trunk gas pipeline sections, 7 compressor stations, 67 gas service areas, 79 automatic gas distribution stations, 77 gas distribution stations, 35 gas distribution points, a total 44 372 km of pipelines, and many other units (http://socar.az/socar/en/activities/services/azerigas-pu).

Residential natural gas prices are set at AZN 100/m^3 (~USD 58/m^3) for consumers whose annual consumption is less than 2 200 m^3, and at AZN 200/m^3 (~USD 117/m^3) for those who consume more than 2 200 m^3. The price for electricity producers (If monthly consumption is not less than 10 million m^3) is fixed at AZN 120 per 1 000 m^3 and for industrial consumers at AZN 200/1 000 m^3 (http://www.tariffcouncil.gov.az/?/az/content/66/).

Regional markets and interconnections

Figure 2 Oil and gas interconnectors of Azerbaijan



Source: SOCAR.

Oil and gas pipelines connect Azerbaijan with its neighbours, as well as with European and world markets. Three major pipelines run through the country, owned by either BP or SOCAR. The BTC oil pipeline, which connects Azerbaijan with Turkey via Georgia, began operations in June 2006, and since then the level of regional integration has increased considerably as oil exports have more than doubled. Azerbaijan also exports oil via the Black Sea through the Baku-

Novorossiysk pipeline to gain access to the Mediterranean market. The Russian leg of the pipeline is owned and operated by Transneft, the Russian pipeline operator, reinforcing the country's close trade relationship with Russia. The SOCAR-owned, BP-operated Baku-Supsa pipeline, whose route parallels that of the BTC via Azerbaijan and Georgia, was commissioned in 1999 and has strengthened the country's relationship with Georgia.

Regional energy co-operation takes place within the framework of the Baku Initiative, a political dialogue launched by a ministerial conference in Baku in 2004 aimed at enhancing energy and transport co-operation between the European Union and the littoral states of the Black and Caspian Seas and their neighbouring countries. It was followed in 2006 by the Energy Ministerial Declaration, which included a roadmap for four priorities: energy market convergence, energy security, sustainable energy development and attracting investment. Azerbaijan regularly participates in the Eastern Partnership and its Platform 3 (connectivity, energy efficiency, environment and climate change).

Bilateral co-operation between the European Union and Azerbaijan is governed by the European Neighbourhood Policy, in line with the Partnership and Co-operation Agreement, which includes energy. The European Union and Azerbaijan launched negotiations in 2010 for a future Association Agreement, which would address energy security provisions.

In late 2011, the European Union began negotiations with Azerbaijan and Turkmenistan on the development of the Trans-Caspian pipeline, which would turn Azerbaijan into a transit country for Turkmen gas going to Turkey and the European Union. Negotiations are ongoing, but support for the project from surrounding countries is lacking.

Azerbaijan participates in the Black Sea Regional Transmission Planning Project, with the support of the United States Agency for International Development (USAID) and the United States Energy Association (USEA), aimed at strengthening regional electricity market conditions and interconnections. In April 2009, the Azerbaijan-Georgia-Turkey (AGT) Power Bridge project was established by the TSOs of the three countries: Azerenergy, Georgian State Electrosystem (GSE) and TEIAS (Turkey). The line from Azerbaijan to Georgia was completed in December 2013, while the energy bridge became operational in 2016. In 2019, Azerbaijan exported 122.7 GWh of transit electricity to Turkey over Georgia.

In 2018 this volume was 13.4 GWh. (https://apa.az/en/azerbaijan_energy_and_industry/Azerbaijan-sharply-increased-electricity-export-to-Turkey-last-year-306940).

Chapter 3. Sustainable development

Azerbaijan is yet to tap into its significant potential for renewable energy and energy efficiency. The government has, however, drafted several laws to that end which are pending approval. Higher ambition and more effort in renewable energy and energy efficiency will also help the country save natural gas and oil for exports and also meet its GHG commitments.

Azerbaijan joined the UNFCCC as a non-Annex I country in 1995 and ratified the Paris Agreement in 2016. The government has outlined climate change mitigation actions in a number of sectors, including energy, and the Ministry of Ecology and Natural Resources is preparing both a national strategy for climate change and a national low carbon strategy.

Because securing energy independence in the long term is central to Azerbaijan's energy policy, it has recognised the value of diversifying its economy, increasing energy efficiency and supporting GHG emission mitigation programmes. It therefore supports the growth of renewable energy sources with the objectives of:

- Recognising the potential of alternative and renewable energy sources in electricity generation.
- Exploring alternative and renewable sources for the sake of energy efficiency.
- Providing jobs in research innovation to develop new energy generation technologies.
- Diversifying and improving the energy capacity of the country to ensure energy security.

Renewable energy

Azerbaijan has a significant untapped potential for renewable energy, as it is relatively sunny and windy and also has sizable and hydro, biomass and geothermal resources. The government is developing a legislative framework to support the use of renewable energy. The draft renewable energy law envisages introducing auctions and tenders as support mechanisms. It also covers the development of other legislative documents, including a draft of a PPA and a connection agreement. In addition, rules on auctions and rules on net-metering/net-billing schemes application are also being drafted.

Solar

Azerbaijan is relatively sunny and has excellent solar power potential. According to the Ministry of Energy, the technical potential is around 23 000 MW. The country's 2 400 to 3 200 sunshine hours annually compare well internationally. So does its solar intensity, estimated at 1 500 kWh/m^2 to 2 000 kWh/m^2. The best resources are in the central river valleys and the north and northwest (www.iaee.org/baku2016/submissions/OnlineProceedings/6820-TRANSITION_SED_AZ.pdf).

Wind

Azerbaijan is relatively windy, especially along the Caspian Sea coast. According to the Ministry of Energy, the country has around 3 000 MW of technical and around 800 MW of economic wind power potential. The economic potential could generate around 2.4 TWh and save around 1 Mt of conventional fuel and avoid the corresponding carbon dioxide (CO_2) emissions.

The Azerbaijan Scientific-Research and Design Institute of Power Engineering, in co-operation with the Japanese company Tomen, determined that the annual average wind speed in Absheron is between 7.9 metres per second (m/sec) and 8.1 m/sec. The 6 m/sec average speed of the wind further confirms the economic and technical potential of wind power (http://physics.gov.az/PowerEng/2004/v1article/art01.pdf).

Small hydro

Hydropower is the largest source of renewable energy today, and its potential has not been fully exploited. According to the Ministry of Energy, the technical potential for small hydro is 520 MW which could generate up to 3.2 TWh annually (www.iaee.org/baku2016/submissions/OnlineProceedings/6820-TRANSITION_SED_AZ.pdf).

Geothermal

SAARES states that Azerbaijan's geothermal energy potential is up to 800 MW. Initial studies indicate that the 11 geothermal zones available in Azerbaijan hold water of 30°C to 100°C that can generate either electrical or heat energy, depending on the type of thermal water. According to the Azerbaijan National Academy of Sciences, the water temperature is 36°C to 85°C in the Guba region,

and up to 95°C in the Kura-Aras lowland (http://physics.gov.az/PowerEng/2004/v1article/art01.pdf).

Biomass

Rapid growth in industry, agriculture and social services in Azerbaijan is creating new opportunities for electricity generation from biomass derived from combustible industrial waste, forestry and food processing waste, agricultural waste, and other biological substances. The Ministry of Energy estimates a technical potential of 380 MW.

Waste

More than 2 Mt of solid domestic and production wastes are disposed of at waste treatment sites in Azerbaijan annually. Processing solid domestic and production wastes could help resolve the problems in heating public buildings in Baku and other large industrial cities.

Energy efficiency

Azerbaijan does not yet have specific legislation for energy efficiency. However, in recent years, the government has been committed to develop energy efficiency legislation. In 2016, the President approved the Strategic Roadmap for Development of Utilities Services (electric energy, heating, water and gas) and the Parliament ratified the Paris Agreement. Furthermore, the draft Law on the Efficient Use of Energy Resources and Energy Efficiency is expected to be submitted by the President to the Parliament in the near future. The government is also developing a National Action Plan on Energy Efficiency (NEEAP).

There is a clear case for rapid action on energy efficiency, building on the draft legislation currently being considered and bearing in mind Azerbaijan's climate pledge under the Paris Agreement to reduce GHG emissions by 35% from 1990 to 2030. Experience in IEA member countries shows that minimum energy performance standards are among the most effective and cost-efficient energy efficiency policy instruments. The government should introduce stringent standards across all sectors: buildings, vehicles, appliances and equipment and implement an effective mechanism for energy efficiency audit.

Azerbaijan needs to attract more private sector investments to modernise equipment, to apply energy efficient technologies and to set up a market-oriented management systems.

The level of energy prices is critical for attracting investment and for encouraging citizens to use energy efficiently. Oil, gas and electricity prices for end-users in Azerbaijan are among the lowest in the region. Current energy prices are below full costs of supply. In 2018, energy price subsidies in Azerbaijan were three times higher than in 2010 and amounted to USD 2.6 billion, or 5.8% of GDP, according to IEA estimates. Under such subsidised tariffs, residential and industrial consumers do not have incentives to improve energy efficiency. Energy saved could be exported to bring revenue or simply used more efficiently elsewhere for the benefit of the national economy.

Fuel switching

Over the last 20 years, Azerbaijan has invested heavily in modernising its energy infrastructure, including for electricity generation. A 2002 presidential decree was adopted for the energy sector, setting the goal of eventually switching all thermal power plants to natural gas, and in the following years old generation plants were all modernised and switched. More than 90% of electricity generation is now from natural gas, but the system is designed to switch back to heavy oil in emergencies.

Environmental protection

The main objectives of Azerbaijan's environmental policy are to protect existing ecological systems while realising the country's economic potential, and to efficiently use natural resources to meet the energy needs of present and future generations. Ensuring sustainable development from an environmental viewpoint means avoiding or minimising any serious environmental impacts resulting from economic activities.

Three main objectives of Azerbaijan's environmental policy have been formulated:

- taking environmental security as a basic requirement, applying best available practice to sustainable development principles for minimising human impact on the environment and regulating its protection
- efficiently using natural resources, using renewable energy sources through alternative, nonconventional methods and achieving energy efficiency to meet the needs of present and future generations

- assessing national requirements in consideration of global environmental issues, finding solutions and ensuring their implementation by expanding relations with international organisations. (http://eco.gov.az/az/ekoloji-siyaset/azerbaycan-respublikasinin-ekoloji-siyaseti)

Environmental protection in Azerbaijan is governed by the Law on Environment Protection (1999), which establishes the main environmental protection principles and the rights and obligations of the state, public associations and citizens. It establishes requirements for environmental impact assessments, for environmental quality standards and for permits concerning activities that affect the environment, for prevention and reduction of environmental pollution, and for environmental monitoring and control. It also addresses the role of the public and sanctions imposed on violators (https://www.ardda.gov.az/uploads//images/qanunvericilik/Eng/Codes_of_Az/Law%20of%20the%20Azerbaijan%20Republic%20Environment.pdf).

Transport is by far the largest source of air pollution in Azerbaijan, accounting for 85% of the total volume of air pollutants in the country. Fuel quality is the key to limiting air pollution from transport, the sector that consumed more than three-fifths of all oil in 2018. Azerbaijan follows the EU vehicle emission standards and since April 2014, applies the Euro 4 standard that contains limit values for several pollutants, including NOx and PM. The ongoing modernisation of the Heydar Aliyev Oil Refinery, which serves almost all transport fuel in the country, will also enable it to produce high-quality diesel and petrol meeting the Euro 5 standard.

In contrast to transport, air pollution from stationary sources has decreased over the past 15 years, thanks to a switch from oil-fired to gas-fired power generation and to modern technologies in oil and gas production. Emissions can be reduced further through increasing efficiency, saving energy and using alternative energy sources.

Climate change

Azerbaijan approved the UNFCCC in 1995 and the Kyoto Protocol in 2000. In 2016, Azerbaijan signed the Paris Agreement and ratified it in 2017. Its NDC is to reduce GHG emissions by 35% from 1990 to 2030. The latest official GHG emissions figures are from 2017, when emissions were 38% below 1990 levels and the energy sector accounted for 75% of total emissions. According to the most recent IEA data, in 2017 Azerbaijan's CO_2 emissions from fuel combustion amounted to 30.9 Mt (+6.6% since 2005, -42.1% since 1990). Attaining the 2030

NDC target, however, will be complicated without tackling the rise in transport fuel demand (unrestrained by prices or taxes) and the rise in natural gas demand (subsidised in all sectors).

At the moment, the country does not have legally binding climate targets or measures. It has, however, outlined climate change mitigation actions in its energy, oil and gas, residential and commercial, transport, agricultural, and waste sectors. These actions primarily entail technological improvements to reduce the negative environmental impact of various sectors of the economy, together with some regulatory changes and public awareness measures. The Ministry of Ecology and Natural Resources is preparing a National Strategy for Low-Carbon Development and a Climate Change Adaptation Plan, and working groups with representatives of all the relevant ministries and state agencies have been established.

Technology research, development and deployment

The National Academy of Sciences co-ordinates academic research, while the Ministry of Energy, the Ministry of Transport, Communications and High Technologies, the Azerbaijan State Oil and Industrial University and SOCAR carry out RDI activities through their own or subordinated institutes. Private business and international financial institutions/donors also contribute in this field.

The system and governance of research, development and innovation (RDI) in Azerbaijan remains fragmented. In January 2019, the President issued an order "On ensuring co-ordination in the field of innovative development in the Republic of Azerbaijan". However, the policy and funding seem to be fragmentary and only partly co-ordinated and would benefit from streamlining.

Total spending on all research and development is about 0.19% of GDP, around half the level of the lowest member country of the Organisation for Co-operation and Development (OECD), but similar to the levels of other newly independent states. RDI is funded from the state budget, the State Science Fund and SOCAR and partly by the private sector. Only a small portion of state funding is allocated to energy-related RDI.

Azerbaijan's economy as well as its energy research and technology base is dominated by the oil and gas industry. Diversifying to energy efficiency and renewable energy solutions in RDI would merit effort. RDI in the field of energy

efficiency and renewable energy would benefit from a framework legislation that would create the conditions for RDI in this field and provide incentives for small and medium-sized enterprises.

Azerbaijan has several research and educational institutions that carry out energy technology research and development. They have participated in national and international programmes and projects to enable Azerbaijani scientists and researchers to contribute and also acquire new skills and knowledge.

The High Technologies Park of the Azerbaijan National Academy of Science was created by the presidential decree of 8 November 2016. The main objectives of the High-Tech Park are the establishment of application mechanisms for industry-driven projects, the provision of technological innovation for mass production, and the enabling of practical works in the field of science and technology. The technology parks in free industrial zones are offered tax, land acquisition and customs benefits.

The High Tech Research Centre was established under the Ministry of Transport, Communications and High Technologies, which aims to import advanced technologies to Azerbaijan and develop science-based industries in the country.

The November 2018 Presidential Order No. 2090 on the **State Programme on Increasing the International Competitiveness of Higher Education System in the Republic of Azerbaijan** for 2019-23 mandates the development of dual degree programmes through collaboration with internationally acknowledged best universities.

The Oil and Gas Research and Design Institute of SOCAR conducts research activities in nanotechnology, exploration and production, etc.; funds research with AZN 5 million together with the National Academy of Science; and provides stipends to scientists.

The Baku Engineering University started in 2013 a technology park for student innovation support. The park organises competitions and provides funding to help develop innovative ideas.

This publication has been produced with the financial assistance of the European Union and is part of the EU4Energy programme. This publication reflects the views of the International Energy Agency (IEA) Secretariat but does not necessarily reflect those of individual IEA member countries or the European Union. The IEA makes no representation or warranty, express or implied, in respect to the publication's contents (including its completeness or accuracy) and shall not be responsible for any use of, or reliance on, the publication.

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Typeset in France by IEA - June 2021
Cover design: IEA