U.S. Energy Information Administration

‹ Countries

Kazakhstan

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full report

Overview

Kazakhstan, an oil producer since 1911, has the second largest oil reserves as well as the second largest oil production among the former Soviet republics after Russia.

Kazakhstan is a major oil producer, and estimated total liquids production was 1.64 million barrels per day (bbl/d) in 2013. The key to its continued growth in liquids production from this level will be the development of its giant Tengiz, Karachaganak, and Kashagan fields. Development of additional export capacity also will be necessary for production growth.

Although Kazakhstan became an oil producer in 1911, its production did not increase to a meaningful level until the 1960s and 1970s, when production plateaued at a nearly 500,000 bbl/d, a pre-Soviet independence record production level. Since the mid-1990s and with the help of major international oil companies, Kazakhstan's production soared to more than 1 million bbl/d in 2003.

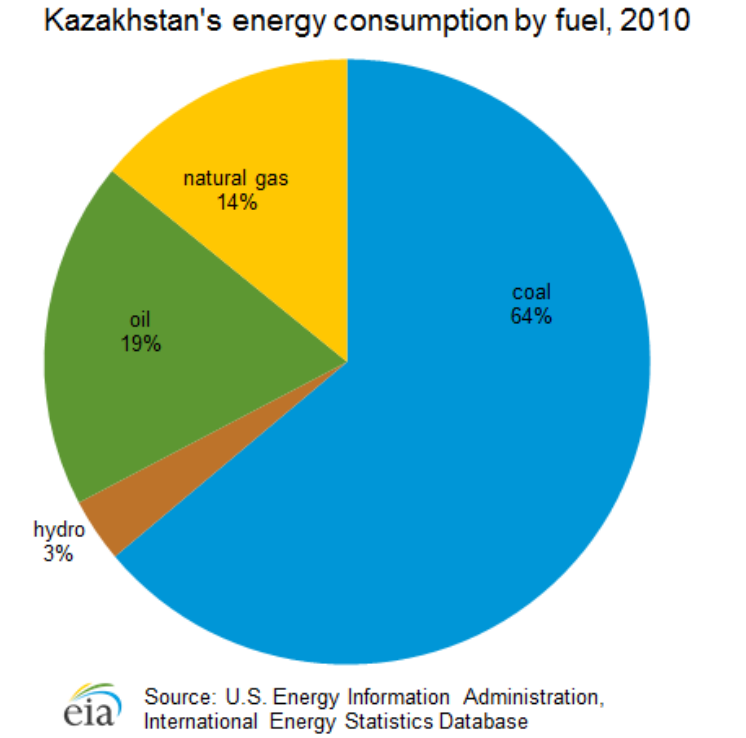
Rising natural gas production over the past decade has both boosted oil recovery (as a significant volume of natural gas is reinjected into oil reservoirs) and also decreased Kazakhstan's reliance on natural gas imports. Natural gas development has lagged oil due to the lack of domestic gas pipeline infrastructure linking the western producing region with the eastern industrial region, as well as the lack of export pipelines.

Kazakhstan is land-locked and lies a great distance from international oil markets. The lack of access to a seaport makes the country dependent mainly on pipelines to transport its hydrocarbons to world markets. It is also a transit country for pipeline exports from Turkmenistan and Uzbekistan.

Kazakhstan consumed a total of 2.3 quadrillion Btu of energy in 2010, with coal accounting for the largest share of energy consumed at 64%, followed by oil and natural gas at 19% and 14%, respectively.

Kazakhstan is a Caspian Sea littoral state. The legal status of the Caspian area remains unresolved, mainly driven by a lack of agreement on whether the Caspian is a sea or a lake. Until all states agree on a definition, legal status of the area will remain unresolved.

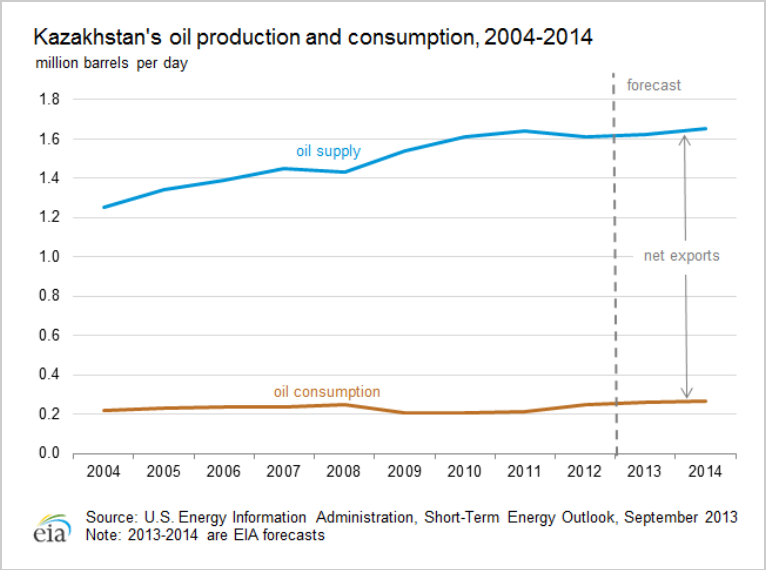
Source: CIA, World Factbook



Oil

Kazakhstan's current production is dominated by two giant fields: Tengiz and Karachaganak, which produce about half of Kazakhstan's total output. The newly-started Kashagan field will also play a major role in Kazakhstan's oil production in the coming years.

Kazakhstan's proven oil reserves were estimated at 30 billion barrels by the *Oil and Gas Journal* in January 2013. The country's main oil reserves are located in the western part of the country, where the five largest onshore oil fields (Tengiz, Karachaganak, Aktobe, Mangistau, and Uzen) are located. These onshore fields account for about half of current proven reserves, while the offshore Kashagan and Kurmangazy oil fields, in Kazakhstan's part of the Caspian Sea, are estimated to contain at least 14 billion barrels, with Kashagan accounting for around 9 billion barrels.



Sector organization

KazMunaiGas, Kazakhstan's national oil company, has played an increasingly important role in the country's oil and gas sector.

In March 2010, the Ministry of Energy and Mineral Resources was dissolved and replaced by the Ministry of Oil and Gas and the Ministry for Industry and New Technologies, which are responsible for the petroleum industry and mining, respectively. The realignment of the ministries was designed so the state can play a more central role in the oil and gas sector. With this realignment, KazMunaiGas (KMG) is no longer involved in the regulation of the sector, effectively removing the potential for conflicts of government and commercial interests.

In addition to the above-mentioned ministries, additional regulatory bodies involved in the oil sector include the Ministry of Finance (monitors pricing, reporting of revenues, and taxes), Ministry of Environmental Protection (monitors compliance with environmental regulation), and Ministry on Emergency Situations (monitors compliance with health and safety regulations).

The national oil and gas company, KMG, was created in 2002 to represent the state's interests in Kazakhstan's oil and gas industry. Rising oil production has been the result of an influx of foreign investment into Kazakhstan's oil sector since 1991. However, KMG plays a growing role in oil and gas sector development as the government now reserves a majority stake for KMG in all new projects and joint ventures.

KMG has a number of subsidiaries, including KMG Exploration and Production (upstream operator), KazMuaniTeniz (offshore oil and gas operations), KazTransOil (oil pipeline operator), and KazTransGas (gas pipeline operator).

KMG holds equity interests in Karachaganak (10%), Kashagan (16.8%), and Tengiz (20%), as well as interests ranging between 15% and 100% in many of the onshore projects. It holds at least 50% interest in most of the offshore blocks.

Kazakhstan's Law on Subsoil and Subsoil Use governs the transfer of subsoil use rights. It was amended in 2005 to give the state the basis to exercise pre-emption rights on any oil

assets put up for sale in the country, allowing KMG to buy them and thus secure stakes in several of the country's biggest projects. The law was amended again in 2007 to allow the state to make retrospective changes to any existing oil contracts or even break the contracts if they are deemed a threat to the country's security. This change was followed by a June 2010 amendment that established strict local content requirements for oil and gas contracts, and formally abolished the production-sharing agreements (PSAs).

Joint ventures are now the most common type of investment. The Kazakh government's decision to offer exploration blocks to KMG first, letting the state firm negotiate with potential partners rather than issuing blocks via an open licensing process, initially dampened foreign oil company interest. However, KMG signed exploration agreements with Total and Statoil in June 2010 for two offshore Caspian blocks. State-to-state deals with state-owned oil companies, particularly Russian and Chinese, are prevalent. In August 2010, the government announced the re-introduction of oil export duties and increased them in January 2011. Export duties were first introduced in 2008 and then suspended in January 2009. Export duties affect all oil exporters operating in Kazakhstan, with the exceptions of those that include a tax stabilization clause in their contracts.

New legislation passed in 2011 requires all companies to use an increasing share of Kazakh goods and services. For example, starting in July 2011, 70% of all employees had to be Kazakh, and this share increased to 90% in January 2012. However, the management team in a company can remain at the 70:30 ratio. Furthermore, the new regulatory structure has made it more difficult for oil companies to obtain work permits for foreign workers. The new legislation seeks to increase the Kazakh proportion of goods and services from the current 50% to 85% by 2020, according to Wood Mackenzie.

Production

Kazakhstan's two largest projects, Tengiz and Karachaganak accounted for 40% of the country's total liquids production thus far in 2013.

Until Kazakhstan's independence from the Soviet Union, almost all of its oil production came from shallow field discoveries, which were technically and commercially viable at the time. Prior to its independence in the 1970s, a number of large discoveries had been made in pre-salt reservoirs including Karachaganak and Tengiz. However, the development of these fields was not possible at the time because of technical challenges of developing the deep, high-pressure reservoirs. As international oil companies began to participate in Kazakhstan's oil sector and pre-salt deposits became technically and commercially viable, these fields have become the foundation of the country's oil production.

There are approximately 150 fields onstream in Kazakhstan, but the two largest projects, Tengiz and Karachaganak, accounted for more than 40% of the country's year-to-date production in 2013, according to data published by Energy Intelligence. This proportion is likely to change somewhat as Kashagan's production slowly comes online. However, expansion plans for Tengiz and Karachaganak likely will result in increased production from these two fields within the next few years. Although it is the second-largest liquid fuels producer among Former Soviet Union republics, Kazakhstan's future as an oil producer depends on the development and expansion of its three largest projects: Karachaganak, Kashagan, and Tengiz.

Kazakhstan's oil production reached 1.61 million barrels per day (bbl/d) in 2012; however,

data for 2013 thus far indicate that liquids production in Kazakhstan will be slightly higher for the year at 1.64 million bbl/d. Kazakhstan's production has seen an impressive expansion since 1995 with help from foreign oil companies. It surpassed the 1.0 million bbl/d production level in 2003 and steadily grew to be second only to Russia among Former Soviet Union republics.

Kazakhstan has seen a significant increase in foreign investment following its independence, and there are now a number of international oil companies involved in the country's major projects. KMG had previously held significant stakes in these projects, but over the past few years it has taken steps to consolidate its holdings in some projects while selling off its stake in others.

Chevron holds the largest stake of any foreign international oil company (IOC) and is the largest producer in the country. It has a 50% stake in the Tengiz field and an 18% stake in the Karachaganak field. Chevron has been operating in Kazakhstan for decades, having entered the country during the Soviet era.

In addition to Chevron, other IOCs operating in Kazakhstan are ExxonMobil, Shell, Total, ConocoPhillips, Eni, CNPC, PetroChina, LUKoil, as well as a number of other smaller international oil companies.

Asian companies, particularly Chinese oil companies, have been expanding their stakes in Kazakhstan's upstream. The most prominent participants are China National Petroleum Corporation (CNPC) and PetroChina, which have acquired stakes in Kazakh companies as well as direct interest in various projects including Kashagan.

Largest currently producing oil fields

Tengiz is currently Kazakhstan's largest producing oil field with an output of approximately 540,000 bbl/d through August 2013, accounting for nearly a third of total production. The field is located onshore in northwestern Kazakhstan. It is the world's deepest operating giant field at 12,000 feet. It has been in development since 1993 by the Tengizchevroil (TCO) joint venture, which includes Chevron (50%), ExxonMobil (25%), KMG (20%), and LukArco (5%). According to Wood Mackenzie, production at Tengiz is expected to increase to 854,000 bbl/d by 2021. Tengiz output is currently exported through the Caspian Pipeline Consortium (CPC) oil pipeline, which runs from Tengiz to Novorossiysk, Russia on the Black Sea. In addition, smaller volumes of the Tengiz oil are transported via rail to Odessa and Feodosiva, Ukraine, as well as to Aktau, Kazakhstan.

Karachaganak, also onshore in northwestern Kazakhstan close to the Russian border, produced 231,000 bbl/d of mostly condensate between January and August 2013, accounting for about 12% of total production. According to Karachaganak Petroleum Operating (KPO), the field holds reserves of around 9 billion barrels of oil and gas condensate and 47 trillion cubic feet of natural gas. The field is operated by the KPO consortium under a PSA. KPO includes BG and Eni, (each 32.5%), Chevron (20%), and Lukoil (15%). Wood Mackenzie expects that production from Karachaganak will increase to 239,000 bbl/d by 2021.

Uzen oil field, located in southwestern Kazakhstan in the Mangistau region, produced approximately 104,000 bbl/d in the first eight months of 2013. It is 100% owned by KMG and has been in operation since 1961.

Mangistau oil field, in the same region, produced 121,000 bbl/d between January and

August 2013. It is operated jointly by KMG and CNPC.

Kashagan

The Kashagan field, the largest known oil field outside the Middle East and the fifth largest in the world in terms of reserves, is located off the northern shore of the Caspian Sea near the city of Atyrau. The field is being developed by the North Caspian Operating Company (NCOC) consortium. The NCOC PSA is led by KMG, Eni, ExxonMobil, Shell, and Total, each with a 16.8% share; and Inpex at 7.56%. In September 2013, CNPC purchased an 8.40% share in the project that had previously been held by ConocoPhillips. The Kashagan contract area includes Kashagan, Kalamkas, Kashagan South West, Aktoty, and Kairan fields. Appraisal work is ongoing at the other fields to determine whether they are commercially viable.

Kashagan's proved reserves are estimated at 13 billion barrels of oil. On September 11, 2013, NCOC reported starting production from the super-giant field, eight years after the original scheduled startup date. The start of the production was in advance of the October 2013 deadline set in the consortium's PSA; if the production deadline had not been met, NCOC would have forfeited compensation for expenditures.

Much of the repeated delays were due to cost overruns associated with the field's adverse operating environment and complexity. The Kashagan reservoir is located more than 13,000 feet below the seabed and is under very high pressure (770 psi) and high levels of hydrogen sulfide. In addition, conventional drilling and production technologies such as fixed or floating platforms cannot be used because of the shallow water and cold climate. Instead, offshore facilities are installed on artificial islands (drilling and hub islands) that house drilling and processing equipment; the processing facilities separate recovered liquid from the gas, and in turn process the gas for reinjection and power generation systems.

Kashagan offshore facilities

Source: North Caspian Operating Company

Exports

Kazakhstan is an important exporter of light, sweet crude oil. In 2012, Kazakhstan's net total liquids exports totaled nearly 1.4 million bbl/d. The current infrastructure delivers the oil to export markets by pipelines to the Black Sea via Russia; by barge and pipeline to the

Mediterranean via Azerbaijan and Turkey; by barge and rail to Batumi, Georgia on the Black Sea; and by pipeline to China.

According to Kazakhstan's Customs Control Committee of the Ministry of Finance, the largest share of its exports was destined for Italy in 2012 (at about 355,000 bbl/d). Other notable importers of Kazakhstan's liquid fuels included China, the Netherlands, France, and Austria. The United States did not import any oil from Kazakhstan in 2012, the first time this happened since at least 2004.

Kazakhstan's exports likely will expand in the coming years, as new fields, particularly Kashagan, come online. However, the rapid growth of oil production and exports will require an expansion of export capacity.

Most of the current pipeline system was developed as part of the Soviet system, and its goal was to maximize transport of oil to Russia. Following the break-up of the Soviet Union, Kazakhstan was wholly dependent on Russia for its exports, giving Russia complete control over Kazakhstan's exports. Over time, however, Kazakhstan has been able to reduce its dependence on Russia's infrastructure by utilizing trans-Caspian tankers and rail, and by building a pipeline to China. Still, a majority of its exports have to be shipped via Russia's pipelines.

Kazakhstan engages in oil swaps with Iran, where oil is shipped to the Iranian port of Neka and sent further to refineries in Tehran and Tabriz. In return, Iran delivers the equivalent amount of oil through its Persian Gulf ports on behalf of Kazakhstan. However, despite a number of agreements to increase swap volumes between Kazakhstan and Iran, volumes have declined over the years, and according to some reports were as low as 25,000 bbl/d in 2012. In the past, trading firms Vitol, Select Energy, Litasco, Silk Road, and Ocean Energy all had swap arrangements with Iran.

Export oil grades

Until recently, Kazakhstan had four main export oil grades, including the CPC Blend, Karachaganak condensate, Kumkol, and Tengiz. With the commencement of production at the Kashagan field, the Kashagan grade is becoming part of the export mix.

CPC Blend is a very light (44.2° API), sweet grade (0.53% sulfur), and is valued for its production of gasoline and light distillates. Its components include some Russian grades such as Siberian Light, as well as Kumkol and Karachaganak condensate, along with a variety of other Russian and Kazakh grades, according to Energy Intelligence.

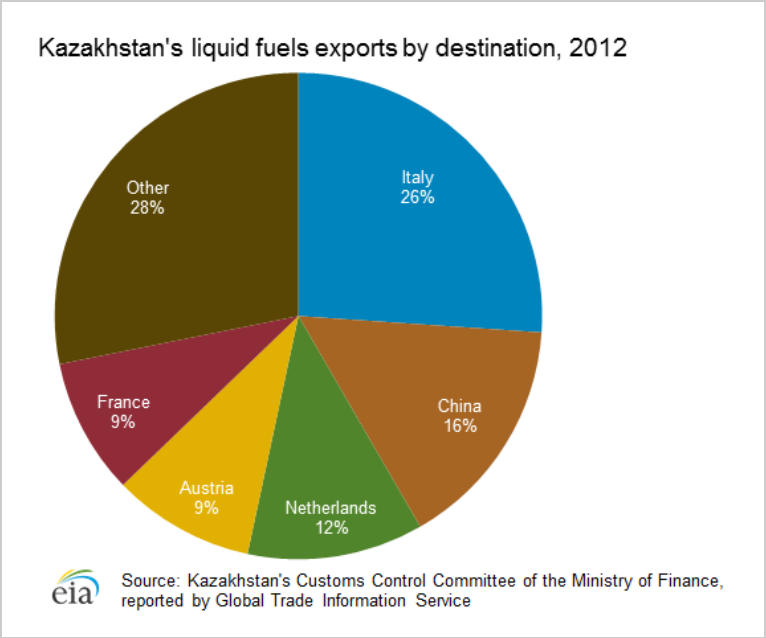
Karachaganak condensate, originating from the Karachaganak gas and condensate field near the Russian border, is mainly exported as part of the CPC Blend. The remainder of the grade is shipped via Russia's Transneft system to the Baltic port of Primorsk and to the Ukrainian Black Sea port of Odessa. Although very light at 44.7° API, it is very sour with a sulfur content of 0.81%.

Kumkol grade (41.2° API, 0.11% sulfur) originates from a variety of fields in central Kazakhstan, and is a waxy crude prized by a number of European refiners. It is exported both as a blend (through the Kazakhstan-China pipeline), and as a distinct grade (via the Black Sea port of Batumi), although much of it is refined domestically, providing oil products to southern Kazakhstan.

Tengiz grade is a blend of crudes from the Tengiz and Korolev fields and is very similar in

quality to Saudi Arabia's Arab Light with an API gravity of 47.2° and 0.55% sulfur content. Most of the Tengiz blend is mixed with CPC Blend for exports, although small amounts are marketed as a distinct grade. Tengiz is by far the largest grade by volume and the most significant stream in terms of government revenues.

Following the field's discovery, Eni reported that Kashagan crude oil tested at around 42° API with less than 1% sulfur content. The main export outlet for Kashagan's volumes likely will be the Turkish port of Ceyhan, via the Baku-Tbilisi-Ceyhan (BTC) pipeline.



Oil pipelines

Kazakhstan's pipeline system is operated by the state-run KazTransOil, a subsidiary of KazMunaiGas, which runs approximately 3,400 miles. Development of additional capacity, particularly export capacity that would remove Kazakhstan's dependence on Russia, is key to its future ability to increase production.

Caspian Pipeline Consortium (CPC)

The Caspian Pipeline Consortium (CPC) oil pipeline was commissioned in 2001 and runs 940 miles from the Tengiz oil field to the Russian Black Sea port of Novorossiysk. The consortium's four largest shareholders are: Transneft (24 percent), KMG (19 percent), Chevron (15 percent), and LukArco (12.5 percent). The pipeline consists of refurbished Soviet-era pipeline links along the Caspian and newly constructed components along the line. The consortium transported an average of 614,000 bbl/d of oil in 2012, and approximately 581,000 bbl/d between January and September 2013. In 2011, CPC partners began work to expand the pipeline capacity to 1.35 million bbl/d. The project will be implemented in three phases, with capacity increasing until 2016. The expansion is expected to provide additional transportation capacity to accommodate increased production from Tengizchevroil.

Kazakhstan-China Pipeline

The Kazakhstan-China oil pipeline spans 1,384 miles, running from Atyrau port in northwestern Kazakhstan to Alashankou in China's northwest Xinjiang region, and has a capacity of 252,000 bbl/d of crude. The pipeline is currently being expanded to increase its

capacity to 400,000 bbl/d. The additional capacity will be used to transport at least some Kashagan oil. The pipeline is a joint venture between CNPC and KMG.

The pipeline was built in segments. The most recently completed segment, the 492-mile Kenkiyak-Kumkol (Phase 3), started commercial operations on October 6, 2009, and connects the Kenkiyak-Atyrau pipeline (Phase 1) to the Atasu-Alashankou pipeline (Phase 2), online since 2006. The cross-border section connects to CNPC/PetroChina's crude oil pipeline system in northwest China. Phase 1, the Kenkiyak-Atyrau pipeline, was the first oil pipeline built in Kazakhstan after independence. This line was tied into the Kazakhstan-China pipeline, and its direction of flow was reversed, now running from Atyrau to Kenkiyak.

Uzen-Atyrau-Samara Pipeline

Kazakhstan's other major oil export pipeline, from Atyrau to Samara, is a northbound link to Russia's Transneft distribution system, which provides Kazakhstan with a connection to world markets via the Black Sea. The line was upgraded in 2009 by the addition of pumping and heating stations and currently has a capacity of approximately 600,000 bbl/d. Before the completion of the CPC pipeline, Kazakhstan exported almost all of its oil through this system.

Baku-Tbilisi-Ceyhan

The Baku-Tbilisi-Ceyhan (BTC) pipeline is a 1 million bbl/d capacity line in neighboring Azerbaijan, which came online in 2006. Kazakhstan has a contract with Azerbaijan and the BTC Pipeline Company to supply up to 500,000 bbl/d of oil via the BTC pipeline. Kazakh oil supplies were loaded into the BTC for re-export for the first time in October 2008. Oil supplies are delivered by tanker across the Caspian to Baku.

Future and proposed developments

Development of Kashagan and other future projects requires significant expansion of Kazakhstan's export capacity. To this end, Kazakhstan is promoting the Kazakhstan Caspian Transportation System (KCTS), which includes the construction of an 515-mile, 600,000 bbl/d capacity onshore pipeline from Eskene in western Kazakhstan to Kuryk on the Caspian near Aktau, where a new 760,000-bbl/d oil terminal is to be built. This system also includes a maritime link to Baku, Azerbaijan, new port facilities, and a transfer station in Baku, where the crude oil will be put into an expanded BTC pipeline to Turkey. The total cost of the KCTS is estimated at $4 billion.

The Kazakhstan-China oil pipeline is currently upgrading to accommodate expected oil from the Kashagan oil field. Other proposals include the construction of the Trans-Caspian oil pipeline, which would provide a western export route for both Kazakhstan and Turkmenistan.

Rail and sea exports

Kazakhstan has an extensive rail network, which it increasingly used to transport liquid fuels both for domestic consumption and for exports. According to Wood Mackenzie, Kazakhstan has the capacity to export about 340,000 bbl/d of oil via rail. Tengizchevroil is the largest oil user of the rail network. The increasing use of rail network for oil transportation has had an effect on the cost, as the price of rail shipping has increased since the 1990s, making it the most expensive transportation option.

Two main ports used for oil exports are Aktau and Semey. Aktau is located in the Caspian

Sea and has a loading capacity of 240,000 bbl/d of oil and oil products. The port has four berths capable of accommodating 13,000-ton tankers, according to Wood Mackenzie.

Semey is located on the Irtish river in the northeastern part of the country. The port is important because during summer months, ship traffic can travel the entire length of the Irtish and Ob rivers to the Arctic Ocean and connect to the rail network.

In addition to Aktau and Semey, a smaller port of Atyrau is also operational. The port can accommodate barges of up to 132 tons. However, this port is ice bound in the winter, according to Wood Mackenzie. It is located at the northern coast of the Caspian Sea.

Downstream and refining

Kazakhstan had a crude oil distillation capacity of 345,100 bbl/d as of January 1, 2013, according to the *Oil and Gas Journal*. There are three oil refineries: Pavlodar, Atyrau, and Shymkent.

The Pavlodar refinery is supplied mainly by a crude oil pipeline from western Siberia, since Russian supplies are well-placed geographically to serve that refinery. Its capacity is 162,666 bbl/d, but it processed approximately 94,000 bbl/d in 2011, according to Wood Mackenzie. Currently, the refinery is undergoing a reconstruction and modernization, which is due to be completed by the end of 2014.

The Atyrau refinery runs solely on domestic crude from northwest Kazakhstan and processed about 90,000 bbl/d in 2012. The Shymkent refinery currently uses oil from the oil fields at Kumkol and the nearby area in central Kazakhstan. It refined approximately 94,000 bbl/d in 2011.

Despite being a significant oil exporter, Kazakhstan experiences regional and seasonal oil product shortages. Because most of the country's oil and gas is produced in the western area, its industrialized northern and southern regions (lacking pipeline connections to the western oil and gas fields) rely on imports from neighboring Russia and Uzbekistan. Until recently, the refining sector in Kazakhstan had not received the high levels of foreign direct investment that other parts of the oil sector have. Because domestic prices for refined products have remained low, oil producers have more incentive to export crude oil to international markets instead of refining it locally.

Natural gas

Most of Kazakhstan's natural gas reserves are associated gas that is located in just four fields: Karachaganak, Tengiz, Imashevskoye, and Kashagan.

In January 2013, the *Oil and Gas Journal* estimated Kazakhstan's proven natural gas reserves at 85 trillion cubic feet (Tcf). Natural gas production in Kazakhstan is almost entirely associated gas. Most of Kazakhstan's natural gas reserves are located in the west of the country, with 77% of total natural gas reserves located in four fields: Karachaganak (46%), Tengiz (12%), Imashevskoye (7%), and Kashagan (12%), according to Wood Mackenzie.

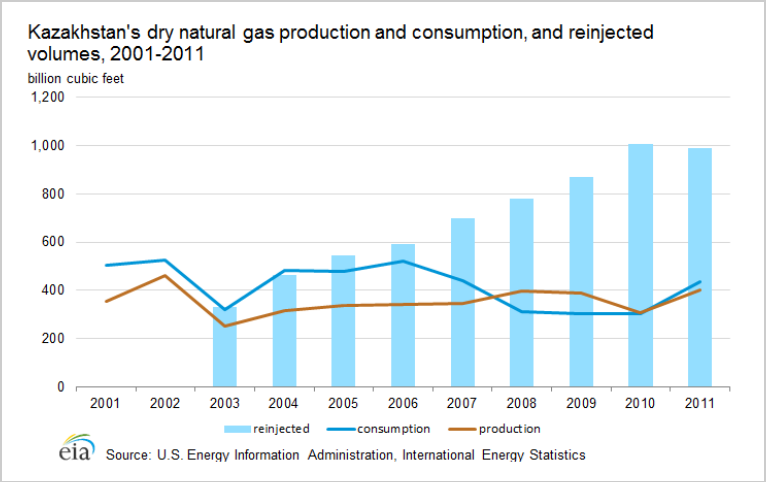
Production

Despite a near four-fold increase in annual gross natural gas production to 1.4 Tcf in 2011 in just a decade, dry natural gas production in Kazakhstan has remained relatively stable, as more than more than 70% of the gas produced was reinjected into oil fields to enhance production. The two largest natural gas-producing fields are also the largest oil-producing fields.

The Karachaganak oil and gas field produced more than 30% of Kazakhstan's total dry gas production, and Wood Mackenzie expects that dry gas production from the Karachaganak field will reach 1.01 Tcf in 2021.

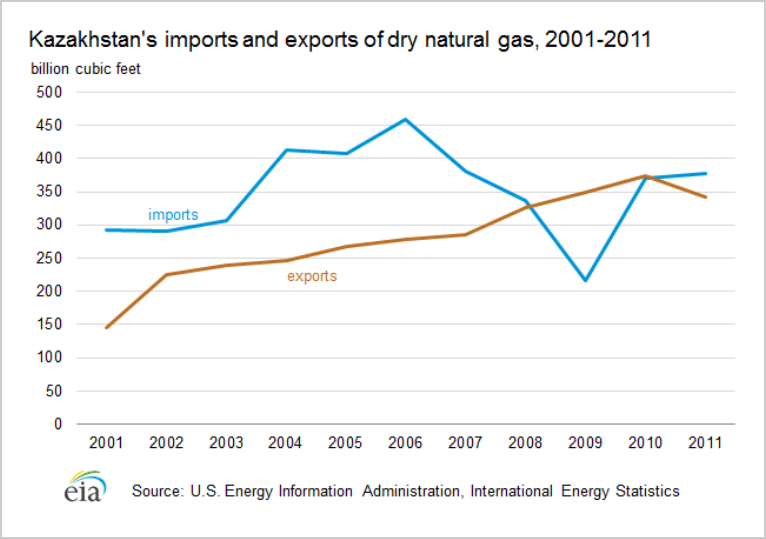
The Tengiz oil and gas field produced approximately 219 Bcf of dry natural gas in 2011, according to Chevron. Wood Mackenzie projects Tengiz will continue to play a significant role in Kazakhstan's gas production, which will peak at 701 Bcf of dry gas in 2017 and fall to 532 Bcf by 2021.

The remainder of gas produced in Kazakhstan comes from other smaller fields. Development of the Kashagan and Imashevskoye fields is important for Kazakhstan's energy security, as gas output from these fields is geared to boost domestic gas supplies and to provide further volumes for enhanced oil recovery. These two fields together are expected to provide more than 1.0 Tcf in dry gas by 2021.



Imports and exports

Between 2008 and 2010, Kazakhstan produced sufficient volume of dry natural gas to satisfy its domestic demand, although increased domestic consumption resulted in Kazakhstan becoming a net gas importer again in 2011. In addition, because of a lack of proper infrastructure linking the demand centers to production areas, the country continues to depend on gas imports to meet domestic demand. The domestic pipeline system is underdeveloped, and Kazakhstan's gas reserves in the west and population centers in the north, east, and south are not connected.



Natural gas pipelines

Kazakhstan has two separate domestic natural gas distribution networks, one in the west, which services the country's producing fields, and one in the south, which mainly delivers imported natural gas to the consuming regions. The lack of internal pipelines connecting Kazakhstan's natural gas-producing areas to the country's industrial belt between Almaty and Shymkent has hampered the development of the country's natural gas resources. Southern Kazakhstan receives much of its natural gas supplies from Uzbekistan via the Tashkent-Shymkent-Bishkek-Almaty pipeline even as the country exports gas from its northwestern region. KazTransGas, a subsidiary of KMG, controls and manages the country's gas pipeline transportation system.

Kazakhstan's pipeline network consists of 7,400 miles of pipeline, 22 compressor stations, and 3 undergrounds storage facilities, according to Wood Mackenzie. The main pipelines are the Central Asia Center (CAC) pipeline, the Bukhara-Ural pipeline, Tashkent-Almaty pipeline, and the Turkmenistan-China pipeline.

Kazakhstan currently serves mainly as a transit country for natural gas pipeline exports from Uzbekistan and Turkmenistan to Russia and China.

Central Asia Centre Pipeline (CAC)

The two branches of the CAC gas pipeline, controlled by Gazprom, meet in the southwestern Kazakh city of Beyneu before crossing into Russia at Alexandrov Gay and feeding into the Russian pipeline system. The eastern branch of the pipeline, which has a throughput capacity of 6.4 Bcf/d, originates in the southeastern gas fields of Turkmenistan. The western branch (500 MMcf/d) originates on the Caspian seacoast of Turkmenistan. Almost all Turkmen and Uzbek gas is delivered via the eastern branch. The pipeline consists of five parallel lines.

Bukhara-Urals Pipeline

A transit gas pipeline from Uzbekistan via Kazakhstan to Russia, with a capacity of about 770 MMcf/d is largely idle, according to Wood Mackenzie. It has several smaller pipelines, as well as an underground storage facility, that are connected to the main line.

Bukhara-Tashkent- Bishkek-Almaty Pipeline

The Bukhara-Tashkent-Bishkek-Almaty is an import and transit gas pipeline that ships gas

from Uzbekistan to Kazakhstan's main southern population centers. This pipeline has a capacity of 250 MMcf/d and runs between Shymkent and Almaty. The pipeline also crosses into Kyrgyz territory to supply Bishkek, the Kyrgyz capital. The Poltoratskoye and Akyr-Tobe underground gas storage facilities are located on the line.

Future pipeline developments

Kazakhstan's central objective is to develop a domestic natural gas system that would interconnect the country's producing and consuming areas. This pipeline system would effectively remove the need for imports from Uzbekistan. Currently, 5 of the 14 regions in Kazakhstan are not connected to the pipeline grid. While a long-term goal to connect these regions exists, the cost and availability of relatively cheap sources of energy such as LGP and coal make this uneconomical now.

Beineu-Bozoi-Akbulak Pipeline

The government is currently promoting the construction of the Beineu-Bozoi-Akbulak pipeline, which is intended to connect Kazakhstan's demand centers with its supply and to allow more exports to China. The pipeline is expected to be completed by the end of 2015.

Tobol-Koksheau-Astana Pipeline

This line will connect currently existing pipelines from Kartaly in Russia to northern Kazakhstan to ship Russian gas to Astana and the center of the country. Projected pipeline capacity is about 290 million cubic feet per day (MMcf/d) and would enable transportation of the Karachaganak gas to Astana.

Natural gas processing

Kazakhstan has a total of 14 natural gas processing plants associated with its natural gas fields. The combined processing capacity in Kazakhstan is 1,862 MMcf/d, with an additional 450 MMcf/d under construction as part of the Kashagan project.

Natural gas processing likely will further expand in the near future as natural gas production increases and the government implements stricter regulations on gas utilization and flaring.

Natural gas processing plants in Kazakhstan

Location	Capacity (MMcf/d)
Akshabulak	30
ADE Fields	7
Chinarevskoye	164
Karachaganak	60
Kazakhoil-Aktobe	39
Kumkol	17
Tengiz	765
Uzen	150
Zhanazhol	380
Other	250
Total	**1,862**

Source: EIA, IHS, Wood Mackenzie

Electricity

The vast majority of Kazakhstan's power generation comes from coal-fired power plants, concentrated in the north of the country near the coal producing regions.

Kazakhstan's total installed generating capacity was approximately 19.5 gigawatts (GW) in 2011 according to IHS, 85% of which was coal-fired power and the remaining 15% was hydropower. During that year, Kazakhstan's net generation totaled approximately 81.2 billion kilowatthours (kWh) of electricity.

Kazakhstan's only nuclear power plant, a BN-350 nuclear reactor at Mangyshlak was decommissioned in 2001. Kazakhstan is home to some of the largest uranium deposits in the world and is the world's largest uranium producer. Although plans have long existed to build additional nuclear power plants, there has been little progress on constructing new nuclear units.

Kazakhstan's grid is operated by the Kazakhstan's Electricity Grid Operating Company, a state-owned company. It is responsible for electric transmission and network management. The country's electricity sector experiences considerable losses during transmission and distribution, which IHS estimates at 15% of total output. There are 15 regional electricity distribution companies, a number of which are privately owned.

Notes

- Data presented in the text are the most recent available as of October 28, 2013.
- Data are EIA estimates unless otherwise noted.

Sources

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