

MEGA PROJECTS

World class projects developed in partnership with leading global integrators.

TENGIZ

Highlights:

<p>OIL PRODUCTION (TOTAL)</p> <p>29,791 ths tonnes (651 kbopd)</p>	<p>OIL PRODUCTION (NET TO KMG)</p> <p>5,958 ths tonnes (130 kbopd)</p>	<p>DEVELOPMENT PERSPECTIVE</p> <p>The implementation of FGP-WPMP will boost oil production from Tengiz by 12 mln tonnes per year</p>
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The premier asset of Kazakhstan’s Oil & Gas industry. Tengiz ranks as the world’s deepest producing super giant oil field and the largest single-trap producing reservoir in existence.

Tengizchevroil LLP (Tengizchevroil) operates a license that includes the unique, supergiant Tengiz field and the adjacent, smaller but still significant, Korolevskoye field. The Tengiz oil field was discovered in 1979, and it is the world’s deepest supergiant oil field.

Currently, oil production and processing are carried out at modern, highly reliable production facilities: KTL (throughput: 14.2 mln tonnes of processed oil in 2019), Second-Generation Plant (SGP, throughput: 15.6 mln tonnes of processed oil in 2019), and Sour Gas Injection (SGI, 3.65 bln m³ in 2019). At the beginning of 2020, the well stock comprised 156 production wells and 8 gas injection wells.

The agreement for the Tengizchevroil LLP project was signed on 2 April 1993 between the Republic of Kazakhstan and Chevron Corp. A 40-year hydrocarbon exploration and production license was granted to Tengizchevroil in 1993.

TENGIZCHEVROIL'S PRODUCT SALES

	2017	2018	2019
Oil, thous. tonnes	28,753	28,800	30,155
Dry gas, mln m ³	7,447	7,532	7,941
LPG, thous. tonnes	1,377	1,345	1,332
Sulfur, thous. tonnes	2,489	2,467	2,585

Tengizchevroil is focused on the exploration, production, and sales of hydrocarbons from the Tengiz and Korolevskoye fields in the Atyrau Region.

KMG share in Tengiz’s oil production increased by 4.1% to 5,958 ths tonnes (130 kbopd) while gas production grew 4.2% to 3,258 mln m³ driven by stable operation and improved reliability of KTL, SGI/SGP facilities despite production stoppages for overhauls. From 1 August to 9 September 2019, Tengiz carried out a scheduled 40-day overhaul at KTL 1.

Outlook for Tengiz

Tengizchevroil is implementing two integrated projects – the Future Growth Project (FGP) and the Wellhead Pressure Management Project (WPMP). The two projects will make a significant contribution to the national economy: the FGP-WPMP has already created about 48 thous. jobs in Kazakhstan, with about 1,000 more permanent jobs to be added to support the operation of the FGP-WPMP. The implementation of the FGP-WPMP will boost oil production from the Tengiz field by 12 mln tonnes per year.

The updated FGP-WPMP budget, given a cost increase from USD 36.8 bln to USD 46.5 bln (including a contingency reserve of USD 1.3 bln), was pending for approval by TCO Partners. TCO partners approved a cost increase of USD 45.2 bln in total under the FGP-WPMP (without approving a USD 1.3 bln contingency reserve).

Future Growth Project (FGP)

The FGP includes the construction of a 12 mln tonnes per year oil preparation plant (Third-Generation Plant, 3GP), and Third Generation Gas Injection (3GI) with an annual capacity of 9.4 bln m³, and well sites, along with well drilling. Commissioning of the 3GI and 3GP facilities is scheduled for 2023.

1.

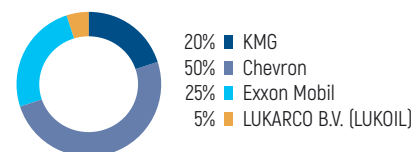
2P OIL RESERVES LIFE

Over
20 years

ASSOCIATED GAS PRODUCTION (TOTAL)¹

16.3
bln m³

INTERESTS, %



OPERATORSHIP

- Tengizchevroil LLP

Wellhead Pressure Management Project (WPMP)

As part of the WPMP project, a new gathering system, pressure boost facilities, infrastructure and ancillary facilities are being constructed to maintain the current oil production rates for the existing KTL and SGP. Commissioning is scheduled for the end of 2022.

Digital projects to transform operations

In 2019, Tengizchevroil embarked on a digital transformation, developing digital solutions to improve safety, better manage risk, improve operating process efficiency and increase revenue.

- A pilot programme to monitor safety compliance has improved employee safety in the field, operating and office environments at the Tengiz field. The programme involved approximately 350 wireless sensors, boosting personal safety levels through increased situational awareness.
- The project on the visualisation and analysis of concurrent activity has enabled consolidated views of core activities and activities under the FGP to drive parallel planning. Timely identification of potential conflicts enables teams to monitor

risk prevention measures, evaluate vast numbers of future on-site activities and reduce production losses.

- The Minimum Viable Product (MVP) definition project enabled comprehensive integration of Tengizchevroil business situation assessment workflow, leading to faster decision making and maximising asset value. The MVP combines rig schedules, well start-up schedules, production forecasts and solution analysis for the quick economic evaluation of development scenarios.
- Real Data Optimisation Programme. Supported by the programme, the FGP and Core Operations teams have developed more than 1,300 observation and analysis screens for real-time data visualisation, with data feeds from over 3,000 sensors covering all facilities and the newly launched “Basic” substation.
- The Automated Process Control (APC) system uses various digital methods such as data mining and simulation to develop a specific set of process settings for existing sites in real time.

TENGIZCHEVROIL'S OPERATIONAL HIGHLIGHTS

	Oil production, thous. tonnes	Associated gas production, mln m ³	Dry gas production, mln m ³	Liquefied petroleum gas (LPG) production, thous. tonnes	Sulphur production, thous. tonnes	Gas injection, mln m ³
2017	28,697	15,860	9,237	1,382	2,566	3,097
2018	28,622	15,625	9,186	1,343	2,574	3,186
2019	29,791	16,290	9,471	1,348	2,589	3,655

¹ Includes gas consumed in operations and gas reinjection.

KASHAGAN

Highlights:

<p>OIL AND CONDENSATE PRODUCTION (TOTAL)</p> <p>14.1 mln tonnes (307 kbopd)</p>	<p>OIL AND CONDENSATE PRODUCTION (NET TO KMG)</p> <p>1,169 ths tonnes (25 kbopd)</p>	<p>2P OIL AND CONDENSATE RESERVES LIFE</p> <p>Over 120 years</p>	<p>NATURAL GAS PRODUCTION (TOTAL)</p> <p>8.5 bln m³</p>
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The giant Kashagan field is the largest discovery in the last four decades and one of the most complex offshore deposits globally.

The North Caspian project is the first major offshore oil and gas project in Kazakhstan. It includes five fields: Kashagan, Kalamkas-Sea, Kairan, Aktoty, and Kashagan South-West fields. The areas of the Kalamkas-Sea and Kashagan South-West fields are in the process of being returned to the Republic of Kazakhstan.

The giant Kashagan field is the largest oil discovery in the last four decades. The estimated 2P oil and condensate reserves life is over 120 years at the 2019 production level.

The Kashagan field lies in an offshore location 80 km from Atyrau at water depths of 3 m to 4 m. The field reservoir lies at a depth of over 4 km and is characterised by high pressures (over 700 bar) and high hydrogen sulphide (H₂S) content. At the same time, sour gas reinjection at high pressures enables enhanced oil recovery.

Kashagan is one of the most challenging industry projects globally due to harsh environmental conditions at sea and significant design, logistics and safety challenges. Located in the subarctic climate, the North Caspian Sea is covered with ice for about five months a year, requiring innovative technical solutions. KMG, together with international partners, is successfully implementing the project, having achieved sustainable production rates with further growth potential.

The Kashagan field construction design comprises onshore and offshore facilities. Onshore facilities include the Bolashak Onshore Processing Facility while the offshore facilities comprise a range of artificial structures including an operational and processing complex on Island D, Island A, and early

production islands EPC2, EPC3 and EPC4. A total of 40 wells were drilled on the Kashagan field, 6 of which are injection wells and 34 production wells.

The Production Sharing Agreement in respect of the North Caspian Sea (NCP SA) was signed by the Republic of Kazakhstan and an international consortium in November 1997. The operator is North Caspian Operating Company N.V. (NCOC), acting on behalf of the contractors.

Currently, KMG has a 50% interest in KMG Kashagan B.V., which in turn holds a 16.88% interest in the Kashagan mega project. The remaining 50% interest, or 8.44% in the project, is owned by Samruk-Kazyna JSC. According to the terms of the addendum to the Option Agreement between Cooperative KazMunayGas U.A.¹ and Samruk-Kazyna JSC, the option period for buying back a 8.44% interest in KMG Kashagan B.V. has been extended from 2018–2020 to 2020–2022.

NCOC's operational highlights

	Oil production, thous. tonnes	Associated gas production, mln m ³	Sulphur production, thous. tonnes	Gas injection, mln m ³
2017	8,286	4,799	1,151	321
2018	13,219	7,697	1,340	2,235
2019	14,127	8,453	1,323	3,148

In 2019, for the first time in Kashagan's history, an overhaul was successfully completed with a total shutdown of all production facilities. The repairs enabled increases in oil and gas production from onshore and offshore facilities, as well as improving the utilisation rate to 98.4%.

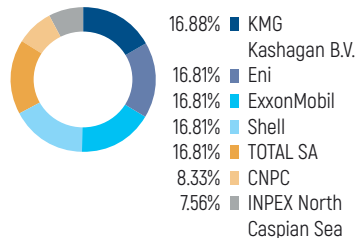
¹ 100% subsidiary of KMG, with the direct ownership of 99.7440256% and indirect ownership via KMG Kumkol LLP of 0.2559744%.

DEVELOPMENT PERSPECTIVE

Subject to final investment decisions (FIDs) for investment projects, oil production from Kashagan has the potential to reach

450 kbopd over the medium-term

INTERESTS, %



OPERATORSHIP

- North Caspian Operating Company N.V.

Oil production from the North Caspian project was 14.1 mln tonnes (307 kbopd) in 2019. Production from Kashagan peaked at around 400 kbopd in 2019, while the average daily production was 344 kbopd in Q4 2019. Associated gas production was 8.4 bln m³.

KMG's share of oil production from the Kashagan field increased by 6.9% to 1,169 thous. tonnes of oil (25 kbopd) while associated gas production grew by 10.4% to 700 mln m³.

Under the PSA terms, all oil produced from the Kashagan field is exported, including KMG's entitlement share of production. The key export destination is the port of Novorossiysk, to which the oil supplies are pumped via the CPC pipeline. KazTransGas JSC is the sole buyer of gas from all contractors at the Kashagan field, with whom a single gas purchase and sale contract has been signed.

Outlook for Kashagan

Once sustainable production rates are achieved, two projects are under consideration in Phase 1 to ramp up to plateau production capacity with the potential to grow oil and condensate production to 450 kbopd in the medium term.

- Bundle 1
- Raw gas supply to third party project

An FID for the projects is expected in the first half of 2020.

Bundle 1

To further ramp up oil production, KMG is considering increased raw gas reinjection and redistribution of gas to other islands through:

- upgrades to the interior parts of the two existing compressors on Island D to increase their capacity
- laying an ultra-high pressure pipeline to shift gas injection from Island D to Islands EPC2 and EPC3
- conversion of three wells on EPC islands to injection.

Commissioning of the project, subject to a positive FID, is scheduled for 2022.

Raw gas supply to third party project

North Caspian Operating Company N.V. and KazTransGas JSC are exploring raw gas supply to KazTransGas' planned gas processing plant with an annual throughput of 1 bln m³ of raw gas per year.

Social and environmental responsibility

Under the North Caspian Sea Production Sharing Agreement, North Caspian Operating Company N.V. allocates funds annually to infrastructure and social projects in the Mangistau and Atyrau Regions. The company allocated USD 75 mln for such projects in 2019, with 11 projects successfully completed – 7 in Atyrau Region and 4 in Mangistau Region.

KARACHAGANAK

Highlights:

<p>PRODUCTION OF LIQUID HYDROCARBONS (STAB.¹) (TOTAL)</p> <p>10.1 mln tonnes, (219 kbopd)</p>	<p>LIQUID HYDROCARBON PRODUCTION (STAB.) (NET TO KMG)</p> <p>1,015 mln tonnes (22 kbopd)</p>	<p>DEVELOPMENT PERSPECTIVE</p> <p>The implementation of investment projects to maintain the achieved liquid hydrocarbon production plateau levels</p>	<p>GAS PRODUCTION (TOTAL)</p> <p>18.6 bln m³</p>
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One of the world’s largest gas and condensate fields

Karachaganak oil and condensate field is one of the largest oil and condensate fields in the world, located in the West Kazakhstan Region and covering an area of over 280 sq. km. The field was discovered in 1979, with pilot development started in 1984.

The Karachaganak project is developed under the Final Production Sharing Agreement (FPSA) signed on 18 November 1997 for a period of 40 years. Equity interests in the project are as follows: Royal Dutch Shell (29.25%), Eni (29.25%), Chevron (18%), LUKOIL (13.5%), and KMG (10%). Royal Dutch Shell and Eni are the joint operators of the Karachaganak project.

The Karachaganak project has three core process facilities, comprising a single system of interrelated and interdependent process units within the Karachaganak field’s production process:

KPC – the Karachaganak Processing Complex, located in the northwestern part of the field and processing liquid hydrocarbons coming from wells as well as feedstock transported from Unit 2 with sour gas reinjection systems (Unit 2).

Core production processes:

- Stabilisation of crude oil (sulphur and mercaptan removal) for further export via the CPC pipeline system
- Treatment (dehydration) of sour gas for reinjection and export to the Orenburg Gas Processing Plant (OGPP)
- Production of treated fuel gas for own production needs of the field, for the production needs of Karachaganak Petroleum Operating B.V., and for the needs of the West Kazakhstan Region
- Wastewater treatment and disposal

Unit 2 – a gas treatment unit located in the southeastern part of the field, which separates and reinjects sour gas

at high pressure and feeds liquid hydrocarbons to the KPC for stabilisation before shipment for export.

Core production processes:

- Treatment (dehydration) of sour gas for reinjection
- Reinjection of sour gas
- Transport of unstable condensate to the KPC
- Wastewater treatment and disposal

Unit 3 – a gas treatment unit located in the northeastern part of the field, which separates and partially stabilises liquid hydrocarbons and gas before shipment for export.

Core production processes:

- Treatment of gas for further export to Orenburg Processing Plant
- Condensate degassing prior to further stabilisation at the KPC
- Wastewater treatment and disposal

At the beginning of 2020, the operating well stock of the field included 156 producing wells and 18 injection wells.

Liquid hydrocarbon production from Karachaganak decreased by 7.3% to 1,015 ths tonnes (22 kbopd) in terms of KMG’s share. Gas production was 1,861 mln m³, down 1.6% year-on-year. The decrease in production was due to the complete shutdown of production facilities at the KPC, as well as Unit 2 and Unit 3 from 16 September to 10 October 2019 for scheduled preventive maintenance, which was the largest in Karachaganak Petroleum Operating B.V.’s history.

Outlook for Karachaganak

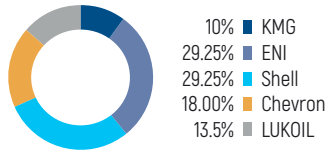
The Karachaganak oil and condensate field is in Phase 2 commercial development (Stage 2M), which includes a number of major capex projects (Production Plateau Extension Projects and the Karachaganak Expansion Project) aimed at increasing raw gas treatment and reinjection capacity to extend the duration of the liquid hydrocarbon production plateau at the achieved rates.

¹ A conversion factor of 0.9 is applied to total oil and condensate production to estimate stable liquid hydrocarbons.

2P OIL AND CONDENSATE RESERVES LIFE

Over **20** years

INTERESTS, %

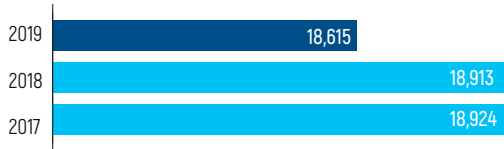


OPERATOR

- Royal Dutch Shell and Eni are the joint operators of the Karachaganak field (Karachaganak Petroleum Operating B.V.)

KARACHAGANAK PETROLEUM OPERATING B.V.'S OPERATIONAL HIGHLIGHTS

Gas production, mln m³



Liquid hydrocarbon production, thous. tonnes



Gas injection, mln m³



KARACHAGANAK PETROLEUM OPERATING B.V.'S PRODUCT SALES

Oil, thous. tonnes



Unstable condensate, thous. tonnes



Commercial gas, mln m³



Production Plateau Extension Projects (Stage 2M):

- Installation of the additional 5th Trunk Line Project – the project will increase the annual volume of gas injection to 10 bln m³ in order to maintain reservoir pressure.
- KPC Gas Debottlenecking Project (KGDBN) – the project envisages commissioning of new glycol gas-dehydration and low-temperature gas separation units with a total capacity of 4.0 bln m³ per year to increase the volume of gas treatment for reinjection and/or export to Orenburg Processing Plant.
- Installation of Unit 2 Fourth Injection Compressor Project (4IC) – laying a network of process pipelines to maintain reservoir pressure and the liquid hydrocarbon production

plateau by increasing annual gas injection volumes from 10 bln m³ to 13 bln m³ per year.

In 2019, the 5th Trunk Line project was commissioned. In May 2019, the Consortium Partners signed an agreement sanctioning the Fourth Injection Compressor Project (4IC).

The successful timely commissioning of the 5th Trunk Line project provides confidence that Karachaganak Petroleum Operating B.V. will be able to successfully meet the expectations and deliver other major CAPEX projects currently under construction: the KPC Gas Debottlenecking Project

(KGDBN) and the Unit 2 Fourth Injection Compressor Project (4IC). Commissioning of these projects is scheduled for 2021.

Combined, the production plateau extension projects will maximise the benefits through:

- increased gas treatment capacity
- incremental liquid hydrocarbon production
- upgrades to existing liquid hydrocarbon treatment units
- reduced rates of pressure declines in the reservoir.

Digital projects to transform operations

As part of the Digital Kazakhstan innovative development state programme, Karachaganak Petroleum Operating B.V. has developed a roadmap for a digital transformation and technology innovation. The current workstreams are focused on the areas of production optimisation, well surveillance, smart plant and digital transformations for project delivery, minimization of paper-intensive processes and maximisation of the automated workflows, warehouse management, improvement of the monitoring and intervention activities.

Digitizing key field parameters will enable Karachaganak Petroleum Operating B.V. to make timely decisions maximising productivity through automated integrated data analysis tools.

Social and environmental responsibility

In 2019, eight social projects were implemented in the West Kazakhstan Region, of which five were civil construction projects (mainly the construction of fitness and recreation centres) and three were road construction and repair projects.

Next-generation multiphase pumps and the Megaflow separator technology are just a few examples of the technology-driven evolution of well treatment and testing at the Karachaganak field across all three phases (gas, oil, and water). This allowed the separated hydrocarbons to be sent directly to the plant without flaring. The deployment of advanced technology and continuous improvement has enabled Karachaganak Petroleum Operating B.V. to dramatically reduce its emissions, achieving a world-class gas utilisation rate of 99.94% for Karachaganak. In 2019, total gas flaring was just 0.056% (10.4 mln m³) of the total gas produced by Karachaganak Petroleum Operating B.V. (18,614.6 mln m³).

OIL PRODUCTION AT OPERATING ASSETS

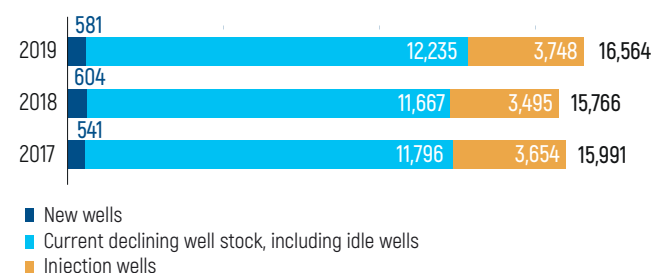
At operating assets developed by KMG independently or with partners, more than half of the fields are mature given the high reserve depletion rates and increased water cuts (over 80%). Commercial development of our mature fields started many decades ago. The first oil discovery in Kazakhstan was made in 1899 at the Karashungul field, currently operated by JSC Embamunaigas. This marked the start of oil production in the country. Thus, 2019 marked 120 years of Kazakhstan's national oil and gas industry. The first gas gusher was struck at the Uzen field in 1960, and oil gusher in 1961. The Karazhanbas gas and oil field came on stream in 1974, when the first oil gusher was struck.

Importantly, today about 80% of total oil production at the Company's operating assets comes from seven key fields: Uzen and Karamandybas (JSC Ozenmunaigas), Kalamkas and Zhetybai (JSC Mangistaumunaigaz), S. Nurzhanov and East Moldabek (JSC Embamunaigas), and Karazhanbas (JSC Karazhanbasmunai).

Improving production efficiency at mature fields is an important driver of the Company's future growth. To achieve this, our production facilities continuously monitor production processes to further optimise them, comply with the corporate energy-saving policy, and search for ways to increase oil recovery rates, e.g. by commissioning new wells, hydraulic fracturing, well workovers, reperforations, and polymer flooding.

In 2019, KMG's share of oil production from operating assets decreased slightly to 15,476 thous. tonnes (307 kbopd). This reflects a natural decline in production levels at the Kazgermunai and PetroKazakhstan Inc. fields by 17.7% year-on-year and 15.5% year-on-year, respectively, which is in line with the planned production decline.

NUMBER OF WELLS AT KMG-OPERATED ASSETS, UNITS



Produced oil profiles vary widely from region to region. The heaviest oil is produced at Karazhanbasmunai, with a conversion factor of 6.68 bbl per tonne. Crude oil produced at large non-operated projects is lighter, with its conversion factor close to 8 bbl per tonne.

A total of 16,564 wells were in operation in 2019, of which 12,235 were classified as the current declining well stock, which accounts for the bulk of oil and condensate production.

KMG'S UPSTREAM SEGMENT INDICATORS IN 2019

	Porosity	API gravity	Sulphur content, %	Number of fields	Average flow rate of new wells, tonnes per day	Average flow rate of the current declining well stock, tonnes per day	Oil conversion factor, bbl/tonne
JSC Ozenmunaigas (100%)	0.19	36.51	0.14	2	11.2	4.4	7.23
JSC Embamunaigas (100%)	0.27	32.03	0.62	33	11.1	3.8	7.30
KazGPZ (condensate) (100%)	0.14	57.05	-	4	-	0.8	-
JSC Karazhanbasmunai (50%)	0.30	19.81	1.55	1	2.9	2.2	6.68
JV Kazgermunai LLP (50%)	0.26	39.95	0.1	5	21.2	26.0	7.38
PetroKazakhstan Inc. (33%)	0.25–27	41.9–66.9	0.03–0.43	23	10.5–17.0	3.53–8.70	7.75
Amangeldy Gas LLP (condensate) (100%)	0.10–0.24	-	0	3	0.15	1.04	-
JSC Mangistaumunaigas (50%)	0.14	30.77	0.2	15	12.7	6.0	7.23
Kazakhoil Aktobe LLP (50%)	0.10	36.12	1	2	-	17.1	7.50
Kazakhturkmunay LLP (100%)	0.14	36.12	3.17	6	-	32.9	7.21

