

Performance highlights

In 2023, total sea transportation rose by 1,435 thous. tonnes year-on-year to 10,778 thous. tonnes. The surge in transportation volumes predominantly stemmed from

higher exports of Kazakhstan's oil routing from the Port of Aktau to the Port of Baku, and then through the Baku–Tbilisi–Ceyhan pipeline.

Marine fleet transportation, thous. tonnes

Sea	2021	2022	2023
Black Sea and Mediterranean Sea	9,318	8,733	10,045
Caspian Sea	537	610	733
Total	9,855	9,343	10,778

Activities completed in 2023

In 2023, NMSC Kazmortransflot made significant progress in implementing its investment projects set to develop additional routes for Kazakhstan's oil exports, reinforce investment ties with international partners, and expand the naval merchant fleet of the Republic of Kazakhstan.

KMTF's key achievements of 2023

- A joint venture with Abu Dhabi Ports Group (ADP):
 - In January 2023, KMG and ADP signed a strategic partnership agreement.
 - In February 2023, the parties set up Caspian Integrated Maritime Solutions Ltd. (CIMS), a joint venture headquartered in the Astana International Financial Centre, with KMTF and ADP ownership split of 49% and 51% respectively.
- Acquisition of two oil tankers:
 - In April 2023, CIMS acquired two oil tankers each with a deadweight of 8,000 tonnes.
 - Taraz and Liwa tankers reached the Caspian Sea in November 2023 and commenced operations in December 2023.
- Kazakhstan's oil transportation via the Aktau–Baku route:
 - KMTF was designated as a maritime transport operator for Kazakhstan.

- Signing a freight contract to transport Tengizchevroil's oil:
 - In May 2023, KMTF signed a freight contract with Chevron Tankers.

Activities planned for 2024

In 2024, NMSC Kazmortransflot is set to continue developing alternative transport routes and implementing initiatives for fleet modernisation and business diversification. KMTF is weighing the following prospective projects:

- building three oil tankers, each with a deadweight of 12,000 tonnes;
- building two multifunctional ferries;
- establishing a ship building and repair facility in Kazakhstan.

These projects are set to boost KMTF's competitive edge in the global maritime transport market and make a sizeable contribution to advancing Kazakhstan's economy.

Downstream



The Company has completed a number of major modernisation projects across its oil refineries in Kazakhstan and Romania, successfully achieving higher refining depths. KMG's 2022–2031 Development Strategy sets the following goals:

- improving the refining depth at Kazakhstan refineries to at least 89%;
- increasing the output of high-margin petrochemicals at Kazakhstan refineries;
- ramping up vertical integration at KMGI by adding more filling stations across its footprint to boost margins.

Oil and condensate marketing

In 2023, sales of own oil and gas condensate to meet domestic demand amounted to 8,311 thous. tonnes, including 4,980 thous. tonnes of crude oil supplied from operating assets (Ozenmunaigas, Embamunaigas, Kazakhturkmunay, Urikhtau Operating) to Atyrau, Pavlodar and Shymkent refineries for further refining and oil product sales.

Sales of KMG-produced oil and condensate, thous. tonnes

Assets	2021			2022			2023		
	Exports	Domestic market	Total	Exports	Domestic market	Total	Exports	Domestic market	Total
Operating assets ¹	6,126	7,916	14,042	5,472	8,412	13,884	5,406	8,302	13,708
including subsidiaries and associates ²	3,805	4,458	8,262	3,173	4,907	8,080	2,955	4,980	7,935
Megaprojects ³	7,619	0	7,619	8,240	3	8,243	9,978	9	9,987
Total	13,745	7,916	21,661	13,712	8,415	22,126	15,384	8,311	23,695

¹ Ozenmunaigas, Embamunaigas, Karazhanbasmunai, Kazgermunai, PetroKazakhstan Inc., Kazakhturkmunay, Kazakhoil Aktobe, Mangistaumunaigaz, Amangeldy Gas, Urikhtau Operating, Dunga
² Ozenmunaigas, Embamunaigas, Kazakhturkmunay, Urikhtau Operating, Dunga
³ KMG Kashagan, KMG Karachaganak, Tengizchevroil

Oil and condensate exports

In 2023, KEBCO consistently demonstrated a positive trend. A market difference (premium) for KEBCO (Platts) to premium Brent grew from negative at the beginning of the year to positive in the second half and kept increasing till the year-end.

The year-on-year decrease in Brent prices in the reporting period was due to the current geopolitical and economic environment.

Oil and condensate sales to domestic buyers

Pursuant to the President’s commission to adopt the so-called combined scheme at oil refineries and further commissions from the Government of the Republic of Kazakhstan, KMG worked to introduce this scheme at its refineries, taking into account the amendments being made to the Law of the Republic of Kazakhstan On State Regulation of Production and Sales of Certain Oil Products with respect to oil supplies to local refineries.

The combined scheme and amendments mentioned above provide for a subsoil user’s affiliate to be recognised as an oil supplier subject to at least one of the following conditions:

- the oil supplier owns at least 50% of shares in the subsoil user;
- the subsoil user owns at least 50% of shares in the oil supplier;
- the oil supplier and subsoil user are controlled by one or more persons owning, directly or indirectly, a total of at least 50% of shares in the oil supplier and subsoil user.

Ozenmunaigas, Embamunaigas, Kazakhturkmunay and Urikhtau Operating supply Atyrau, Pavlodar and Shymkent refineries with KMG’s own crude oil, and the resulting refined products are subsequently sold wholesale domestically or for export.

KMG refining assets

Within KMG’s asset mix, four refineries in Kazakhstan and two in Romania are responsible for processing liquid hydrocarbons (primarily oil).

KMG refineries

Indicator	Kazakhstan refineries				Romania refineries	
	Atyrau Refinery	Pavlodar Refinery	Shymkent Refinery	Caspi Bitum	Petromidia Refinery	Vega Refinery
Location	Atyrau	Pavlodar	Shymkent	Aktau	Năvodari	Ploiești
Commissioning date	1945	1978	1985	2013	1979	1905
Design refining capacity, mln tonnes	5.5	6.0	6.0	1.0	6.0 ¹	0.5
Hydrocarbon refining volumes in 2023, mln tonnes	5.5	5.4	5.7	0.85	5.0 ²	0.4
Refinery utilisation rate in 2023, %	99	91	95	85	84 ³	75
KMG interest, %	99.53	100	49.72	50	54.63	54.63
Nelson Index	13.9	10.5	8.2		10.5	
Light product yield in 2023, %	67	72	77		84	
Refinery co-owners			CNPC	CITIC	Romanian Government	Romanian Government

Consolidated hydrocarbon refining volumes	2021	2022	2023
Kazakhstan refineries			
■ Atyrau Refinery	5,473	5,224	5,475
■ Pavlodar Refinery	5,407	5,480	5,434
■ Shymkent Refinery (50%)	2,582	3,103	2,870
■ Caspi Bitum (50%)	464	461	427
Total for Kazakhstan refineries	13,927	14,269	14,206
Romania refineries			
■ Petromidia Refinery	4,586	5,258	5,012
■ Vega Refinery	321	373	374
Total for Romania refineries	4,907	5,631	5,387
Total	18,833	19,900	19,593

Consolidated oil product output	2021	2022	2023
Kazakhstan refineries			
■ Atyrau Refinery	4,867	4,647	4,858
■ Pavlodar Refinery	4,935	5,168	5,034
■ Shymkent Refinery (50%)	2,352	2,857	2,638
■ Caspi Bitum (50%)	460	456	421
Total for Kazakhstan refineries	12,614	13,128	12,951
Romania refineries			
■ Petromidia Refinery	4,831	5,512	4,848
■ Vega Refinery	320	370	373
Total for Romania refineries	4,790	5,142	5,221
Total	17,445	18,639	18,172

¹ Design capacity includes refining 5 mln tonnes of crude oil and 1 mln tonnes of other hydrocarbons per year.
² Total refining volume of 4.86 mln tonnes includes 4.35 mln tonnes of crude oil and 0.67 mln tonnes of other and alternative feedstocks.
³ Petromidia Refinery utilisation rate is 97.5% based on Solomon Associates’ methodology.





Refining volumes at Kazakhstan refineries

Hydrocarbon refining volumes at Kazakhstan refineries decreased by 0.4% to 14,206 thous. tonnes, primarily at PetroKazakhstan Oil Products, due to a lower utilisation in the middle of the reporting year resulting from unscheduled repairs of a heat exchanger at the catalytic reforming and recovery unit. An increase in refining at Atyrau Refinery in the reporting year partially offset lower PKOP volumes.

Refinery development plans

Initiatives have been planned to boost the output of high-margin products at Kazakhstan refineries, improving their operational efficiency.

- Technical audit for repairs to be performed once in every three years.
- Implementation of the Action Plan with Energy and Resource Efficiency and Atmospheric Emission Reduction Targets for the Period until 2031.

Atyrau Refinery

- Engineering and survey activities (restoring the reformer’s operability, ramping up the capacity of the Prime D hydrotreatment and dewaxing unit, and building a gas turbine power plant, unloading rack for straight-run naphtha and kerosene / gas oil fraction, and new pumping station to enable complete transition to automatic on-spot loading).
- Feasibility study (upgrading the delayed coker unit and building a de-asphalting unit).
- Installation of an oil metering station and floating roofs for tanks intended to store Tengiz oil before refining.
- Tazalyq project: upgrade of mechanical treatment plants (stage 1) is completed, reclamation of sectors 1 and 2 at evaporation fields is completed, reclamation of sectors 3 and 4 is to be completed after the akimat of the Atyrau Region approves redirection of wastewater to new facilities at Atyrau’s sewage treatment plants.

Pavlodar Refinery

- Reconstruction of the diesel hydrotreating plant including a dewaxing unit: the EPC contractor is to develop a project design and order equipment with a long lead time.
- Construction of an LPG treatment facility: the EPC contractor fully supplied equipment and materials, construction and installation are underway.

Shymkent Refinery

- Expansion of Shymkent Refinery’s production capacities to 12 mln tonnes per year: the reporting year saw the PreFS for the project completed, with adjustments to be made to take into account the requirements of CNPC, the second shareholder, after updates on crude oil composition. Work continues to draft an agreement between Kazakhstan and China Governments on the expansion project providing for government support and commitments of the parties.

Caspi Bitum

- Expanding Caspi Bitum’s oil refining capacity to 1.5 mln tonnes per year by upgrading the existing EDD-AVDU unit: technical audit is completed, and detailed project design is ongoing.

Prospective projects and innovations

Atyrau Refinery

To meet the growing demand for light oil products and get the facility ready to receive Tengiz oil, a project was initiated to increase its performance.

The project’s objectives include:

- increasing the output of light oil products;
- eliminating bottlenecks at existing units;
- getting the facility ready to receive Tengiz oil;

Benefits:

- the project includes eight sub-projects to remove bottlenecks and boost light oil product output, namely:
 - refining of Tengiz oil;
 - increasing LPG output;
 - upgrade of an LG-35-11/300-95 catalytic reformer;
 - installation of an extra compressor at Prime D (higher output of diesel fuel);
 - reconstruction of the delayed coker unit;
 - EDD-ADU-2 upgrade to boost the yield of light oil product and improve fuel oil quality;
 - construction of a new pumping station to utilise the existing automatic on-spot loading facilities;
 - construction of infrastructure for straight-run naphtha and kerosene / gas oil fraction.

Light oil products include motor gasoline, diesel fuel, jet fuel, benzene, paraxylene, and liquefied gas. Motor gasoline, diesel fuel, jet fuel, and liquefied gas are valuable because of their social importance, while benzene and paraxylene serve as feedstock for the petrochemical industry.

Oil refining tariffs

Kazakhstan refineries only offer oil refining services using the set tariffs (processing business scheme). Oil suppliers market finished products independently. Refineries focus on the operations side, streamlining refining activities, and reducing operating expenses.

Under this plan, Atyrau Refinery works to reduce direct and indirect emissions by at least 12% by 2031 vs 2019.

The project is scheduled for 2023–2027.

Pavlodar Refinery

- Reconstruction of the diesel hydrotreating plant including a dewaxing unit. This initiative seeks to achieve a winter diesel fuel output of 155 thous. tonnes per year.
- Construction of an LPG treatment facility.

This initiative seeks to achieve a marketable LPG throughput of 100 thous. tonnes per year.

- Action Plan with Energy and Resource Efficiency and Atmospheric Emission Reduction Targets for the Period until 2031.

Under this plan, Pavlodar Refinery works to reduce direct and indirect emissions by at least 15% by 2031 vs 2019.

Shymkent Refinery

- Action Plan with Energy and Resource Efficiency and Atmospheric Emission Reduction Targets for the Period until 2031.

Under this plan, Shymkent Refinery works to reduce direct and indirect emissions by at least 13% by 2031 vs 2019.

Oil refining tariffs at Kazakhstan refineries factor in only actual production-related operating expenses and an investment component (capital expenditures to maintain current production rates, repayment of loans raised for modernisation).

Weighted average tariffs to refine 1 tonne of tolling feedstock, KZT

Refinery	2021	2022	2023
Atyrau Refinery	42,434	42,515	54,079
Pavlodar Refinery	23,033	23,240	23,240
Shymkent Refinery	35,191	35,336	35,336
Caspi Bitum	18,472	24,901	27,791

Hydrocarbon refining volumes and oil product output in Kazakhstan

In 2023, three Kazakhstan refineries conducted scheduled preventive maintenance, with process units put back on track ahead of schedule. Kazakhstan’s Ministry of Energy, KMG and refineries approved a comprehensive

action plan to reduce incidents at Atyrau, Pavlodar and Shymkent refineries for 2023–2027, including a multi-process technical audit to be followed by drafting an upgrade programme. In the reporting year, Atyrau Refinery started producing AI-92 K-5 petrol.

Hydrocarbon refining volumes (net to KMG), thous. tonnes

Refinery	2021	2022	2023
Atyrau Refinery	5,473	5,224	5,475
Pavlodar Refinery	5,407	5,480	5,434
Shymkent Refinery (50%)	2,582	3,103	2,870
Caspi Bitum (50%)	464	461	427
Total	13,927	14,269	14,206

Oil product output (net to KMG), thous. tonnes

Oil products	2021	2022	2023
Atyrau Refinery	4,867 (100%)	4,647 (100%)	4,858 (100%)
■ Light ¹	3,169 (65%)	2,988 (64%)	3,602 (74%)
■ Dark ²	1,499 (31%)	1,447 (31%)	1,073 (22%)
■ Petrochemicals ³	52 (1%)	85 (2%)	49 (1%)
■ Other	147 (3%)	127 (3%)	134 (3%)
Pavlodar Refinery	4,935 (100%)	5,137 (100%)	5,034 (100%)
■ Light	3,736 (76%)	3,879 (76%)	3,895 (77%)
■ Dark	862 (18%)	927 (18%)	809 (16%)
■ Other	337 (7%)	331 (6%)	330 (7%)
Shymkent Refinery (50%)	2,352 (100%)	2,857 (100%)	2,638 (100%)
■ Light	2,035 (87%)	2,348 (82%)	2,222 (84%)
■ Dark	313 (13%)	504 (18%)	410 (16%)
■ Other	4	5	6
Caspi Bitum (50%)	460 (100%)	460 (100%)	421 (100%)
■ Dark	203 (44%)	203 (44%)	179 (43%)
■ Other	257 (56%)	257 (56%)	242 (57%)
Total	12,614	13,101	12,951

Refining depth, %

Refinery	2021	2022	2023
Atyrau Refinery	77.24	75.72	82.09
Pavlodar Refinery	87.79	88.19	89.63
Shymkent Refinery	85.96	82.79	84.88

¹ Petrol, diesel fuel, jet fuel, and LNG.
² Fuel oil, vacuum gas oil, and bitumen.
³ Benzene and paraxylene.



PETROSUN. KMG position in oil product marketing

To improve its positions in oil marketing, KMG acquired a 49% stake in PETROSUN operating in Kazakhstan since 17 January 2012.

Following the acquisition of the 49% stake in PETROSUN, KMG’s share in the domestic market for oil products stands at 80%.

PETROSUN LLC’s core activities:

- foreign trade, commerce, and export and import;
- sales of hydrocarbons and their derivatives;
- refining of hydrocarbons and their derivatives;
- procurement and refining of crude oil, natural gas, oil products, lubricants and fuels in Kazakhstan and elsewhere, including treatment, storage, sales and marketing, distribution, and import and export of crude oil, oil products and hydrocarbons and their derivatives, and procurement of materials and equipment (beyond the scope of natural monopolies);
- acquisition, storage, and transshipment of oil products; and
- oil product transportation.

PETROSUN aims to operate efficiently in Kazakhstan’s oil product market, ensure energy security and maximise its profit from selling lubricants and fuels in the domestic oil product market and exporting them.

PETROSUN refines the acquired crude oil at the following Kazakhstan refineries. For 2023, the company’s actual share in total refining was as follows:

1. Shymkent Refinery – 66%;
2. Pavlodar Refinery – 45%;
3. Atyrau Refinery – 31%.

PETROSUN’s oil products made at these refineries are sold to farm operators in the spring and autumn farming seasons, KTZ – Freight Transportation for the needs of its locomotive divisions, major filling station networks in Kazakhstan, buyers on an exchange, and town-forming industrial enterprises.

Kazakhstan refineries source and refine oil under the combined scheme, whereby the crude is supplied to and processed at refineries by subsoil users, their affiliated or associated marketing entities, and the refineries in their capacity as oil product makers. After processing oil, a refinery returns the resulting oil products to oil owners (resource holders) or sells them. In both cases, the products are then shipped from the refinery.

Production and marketing of oil products derived from KMG’s own oil

Ozenmunaigas, Embamunaigas, Kazakhturkmunay and Urikhtau Operating supply Atyrau, Pavlodar and Shymkent refineries with KMG’s own crude oil, and the resulting refined products are subsequently sold wholesale domestically or for export.

In 2023, Ozenmunaigas, Embamunaigas, Kazakhturkmunay and Urikhtau Operating supplied 4,980 thous. tonnes of crude oil for refining, including 2,452 thous. tonnes to Atyrau Refinery, 1,830 thous. tonnes to Pavlodar Refinery, and 698 thous. tonnes to Shymkent Refinery. The refineries’ combined output for the year was 4,474 thous. tonnes of commercial oil products, including 71% of light products, 19% of dark products, 0.5% of petrochemicals, and 9% of other oil products.

Refinery output of oil products derived from KMG’s own oil in 2023, thous. tonnes

Oil products	Atyrau Refinery	Pavlodar Refinery	Shymkent Refinery	Total	Average oil product wholesale prices over 12M 2023, KZT per tonne
Light	1,501	1,191	494	3,186	214,689
Dark	486	273	97	856	140,067
Petrochemicals	21			21	240,731
Other	157	212	41	410	40,772
Total	2,165	1,676	633	4,474	184,592

Note: light products include motor gasoline, diesel fuel, and jet fuel.
 Dark products include fuel oil, vacuum gas oil, bitumen, and heavy petroleum feedstock.
 Petrochemicals include benzene and paraxylene.

KMG sells oil products wholesale after the oil purchased from Ozenmunaigas, Embamunaigas, Kazakhturkmunay and Urikhtau Operating is refined at refineries in Kazakhstan. In 2023, KMG sold 4,940 thous. tonnes of oil products, primarily light products and fuel oil (79%).

The bulk of oil products was sold domestically (4,224 thous. or 86% out of 4,940 thous. tonnes), and the remainder was exported (716 thous. tonnes). The share of oil product exports in total sales for 12M 2023 was down 12% year-on-year due to a ban on light product exports.



Wholesale of KMG oil products produced in the Republic of Kazakhstan, thous. tonnes

Product	2021			2022			2023		
	domestic market	export	total	domestic market	export	total	domestic market	export	total
Petrol	1,195		1,195	1,333	7	1,340	1,529		1,529
Diesel fuel	1,291	57	1,348	1,513		1,513	1,512		1,512
Jet fuel	120		120	161		161	165		165
Fuel oil	241	542	783	265	588	853	205	504	708
Vacuum gas oil		166	166		105	105		81	81
Bitumen	83		83	125		125	87		87
Coke	79	66	144	56	65	121	50	103	154
Sulphur	3	17	20	5	14	19	12	9	21
Benzene		4	4		3	3		12	12
Paraxylene		25	25		34	34		8	8
Liquefied gas	162	1	163	204		204	230		230
Heating fuel	4		4				3		3
Process fuel	382		382	408		408	411		411
Other	18		18	22		22	21		21
Total	3,577	877	4,454	4,091	816	4,908	4,224	716	4,940

In accordance with Technical Regulations of the Customs Union 013/2011 On Requirements for Motor and Aviation Gasoline, Diesel and Marine Fuels, Fuels for Jet Engines, and Fuel Oil (CU TR), produced fuel conforms with K4 and K5 ecological classes (similar to Euro-4 and Euro-5).

The CU TR does not allow for metal-based additives (manganese, lead, and iron) in motor gasoline and diesel fuel, with sulphur and benzene content not to exceed 50 mg/kg and 1%, respectively.

The upgrade sought to improve the quality of motor fuels to K-5 (similar to Euro-5).

As motor engines running on such fuel generate exhaust gases, the key source of anthropogenic impact on human health, the project also helped reduce the amount of harmful substances as follows:

- sulphur (source of SO₂) – by 10 times;
- aromatic compounds (source of soot) – by 1.5 times;
- benzene (source of benzopyrene, a Group 1 carcinogen) – by 5 times.

Export of oil products broken down by share and supply destination

Oil products	2022			2023		
	Volume, tonne	Country	Share, %	Volume, tonne	Country	Share, %
Fuel oil	585,152	Europe	100	496,582	Europe	99%
				6,955	Uzbekistan	1%
Vacuum gas oil	105,467	Europe	100	80,704	Europe	100%
High-purity paraxylene	33,763	China	100	7,579	China	100%
Benzene	1,684	Russia	53	11,621	China	100%
				1,498	Africa	47
Total coke	18,066	China	30	82,236	China	84%
				7,821	Turkey	8%
				42,978	Russia	70
Calcined coke	780	China	20	3,761	Russia	72%
				3,170	Russia	80
				1,499	China	28%
Sulphur	8,041	Europe	59	3,558	Europe	40%
				5,577	Africa	41
AI-92 K4 petrol	7,454	Europe	100			
Heavy petroleum feedstock for carbon black production	2,630	Russia	100			
Total	816,259			715,672		

KMG supplies diesel fuel for agricultural field operations and provides social and production facilities, and institutions, with fuel oil during the heating season.

In 2023, KMG also sold jet fuel to aviation services of the Ministry of Defence, National Security Committee and National Guard of the Republic of Kazakhstan as well as local airports and airlines through KazMunayGas-Aero and exchange trading.

The rest of the volumes are sold wholesale to third parties domestically or abroad.

In 2023, oil product exports were dominated by dark oil products shipped to Europe. Paraxylene, benzene, coke, and sulphur were supplied to Europe, China, Russia, Tajikistan, and Turkey.

KMG procured oil from four fully owned oil-producing subsidiaries (Ozenmunaigas, Embamunaigas, Kazakhturkmunay, Urikhtau Operating) in Western Kazakhstan to be further refined at three refineries (Atyrau, Pavlodar, and Shymkent).

The Company spent KZT 685 bln on such procurement and refining services.

Due to the completion of production testing and preparations for signing an improved model subsoil contract, Urikhtau Operating suspended oil supplies to Pavlodar Refinery in 2H 2023. In the reporting year, Pavlodar Refinery refined a total of 16.4 thous. tonnes of oil from Urikhtau Operating vs the planned 28.3 thous. tonnes.

In line with oil product supply plans approved by Kazakhstan's Ministry of Energy, motor gasoline, jet fuel, and bitumen were traded on exchange. In November 2023, KMG also started exchange trading of diesel fuel amounting to 10% of total sales under the said plans.

Imports

In 2023, KazMunayGas imported diesel fuel to make up for a domestic shortage occurring on the back of price disparity with neighbouring states and a resulting fuel outflow. All imported volumes were sent to KTZ – Freight Transportation, a subsidiary of Kazakhstan Temir Zholy.

Total demand exceeding total supplies amid regulated prices made it impossible for Kazakhstan refineries to meet growing domestic needs for diesel fuel despite their operation at full capacity.

In furtherance of the order of the Chairman of Samruk-Kazyna's Management Board issued on 30 January 2023, KMG imported 148,665 tonnes of diesel fuel from Russian refineries from February to May 2023.

Additionally, to secure the availability of required stocks, the Fund commissioned Kazakhstan Temir Zholy to independently purchase up to 150 thous. tonnes of diesel fuel from Russia by the end of 2023. At the initial stage, KMG provided Kazakhstan Temir Zholy with advice on such independent purchases.

To prevent such shortages going forward, Kazakhstan refineries are building diesel fuel stocks. Together with the Ministry of Energy, KMG monitors EAEU prices to gradually raise price caps for oil products, reach price parity, and reduce fuel outflow.

Refining in Romania

The core business of KMG International is hydrocarbon refining, as well as wholesale and retail sales of oil products. The KMG International-owned Petromidia Refinery is responsible for primary hydrocarbon refining, with the Vega Refinery focusing on secondary refining. The Petromidia and Vega refineries operate according to the model where refineries purchase hydrocarbons for their own account, refine them, and then sell them either wholesale or retail through an owned retail network of filling stations.

KMG International also owns a major petrochemical complex producing polypropylene and low- and high-density polyethylene (LDPE and HDPE). In addition, KazMunayGas Trading AG, the trading subsidiary of KMG International, is focused on trading in crude oil and oil products produced by KMG International refineries or by third parties.

Refining volumes at KMG International assets (Petromidia and Vega refineries) decreased by 4.3% to 5,387 thous. tonnes following an incident at a mild hydrocracker in mid summer 2023. Currently, repairs are still ongoing at the unit and are to be completed at the end of Q1 2024 due to large-scale work on reactors to ensure their integrity and continued safe operation of the unit.

Hydrocarbon refining volumes (net to KMG), thous. tonnes

Refinery	2021	2022	2023
Petromidia Refinery	4,586	5,258	5,012
Vega Refinery	321	373	374
Total	4,907	5,631	5,387

Oil product output (net to KMG), thous. tonnes

Refinery	2021	2022	2023
Petromidia Refinery	4,470	5,142	4,848
■ Light ¹	3,590	4,075	4,269
■ Dark ²	530	889	411
■ Other	152	178	168
Vega Refinery	320	370	373
■ Dark	93	100	105
■ Other	226	270	268
Total	4,790	5,512	5,221

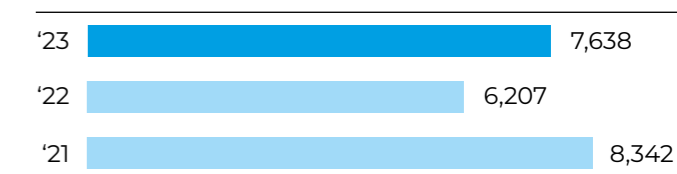
In 2023, Petromidia's refining margin calculated as the difference between Urals crude prices and oil product prices (petrol, diesel fuel, naphtha, liquefied gas, jet fuel, fuel oil, propylene, sulphur, and oil coke) amounted to USD 87 per tonne as the company responded fast to market changes by streaming and maximising output of high-value products.

Petromidia Refinery's refining margin

Unit	2021	2022	2023
USD per tonne	7.2	135	87
USD per bbl ³	1	17.8	11.5

In 2023, crude oil volumes for resale marketed through KMG International's trading operations totalled 7.64 mln tonnes.

Crude oil for resale, thous. tonnes



KMG International's retail network

The 44 stations retail network construction project is part of KMG International's long-term strategy; the focus is on developing the retail segment by expanding on the Romanian market considered the most attractive for retail sales. The project's key mission is to increase the Company's share of the retail oil product market in Romania. Project progress update:

- In February 2023, KMG's Investment Committee approved construction completion and commissioning of 12 highway filling stations as part of CNAIR 1 tender and suspended the construction of standard stations until a decision is made regarding the Spectrum project. Material and equipment purchases along with construction and installation at six filling stations as part of CNAIR 2 tender were also suspended.
- In August 2023, following KMG's letter 42/6438, a decision was made to start obtaining permits for CNAIR 2 locations budgeted at USD 70 thous. per location.
- In November 2023, a joint meeting of working groups from Samruk-Kazyna, KMG and KMG International N.V. decided to suspend the Spectrum project. In light of this decision, the construction of six highway filling stations as part of CNAIR 2 tender held in 2022 proceeded on an increased budget, while the project for standard stations will go on within the established budget of up to USD 1.8 mln per station.
- CNAIR 1 tender saw 12 highway filling stations constructed and 11 opened. The last station was completed in December 2023 and put in operation in February 2024.

¹ Petrol, diesel fuel, jet fuel, and LNG.

² Oil coke, fuel oil, natural gasoline.

³ To convert tonnes to bbl a conversion factor of 7.6 was used.

Production suspension at Petromidia Refinery

In summer 2023, Petromidia Refinery had an incident resulting in a partial shutdown of production. An investigation of the KMG International commission identified violation of procedures by the operating personnel as the root cause of the incident, with remedial action taken with respect to responsible persons and procedures. The fire partially disrupted the operation of the mild hydrocracker's static and rotating equipment. There were no victims in the incident, with a Global Security Systems fire engine driver sustaining damage as he bruised his ankle while jumping from the ladder. At present, repairs at the mild hydrocracker are completed, with the unit back on track from 26 February 2024.

Refinery development plans

As part of new laws drafted by the Romanian government in 2023, KMG International updated investment initiatives aimed at compliance with these laws, among other things.

- On 1 January 2023, Romania introduced a requirement on the minimum percentage of the next-generation biofuel. On 6 December 2022, the government approved Ordinance No. 163/2022 for supplementing the legal framework on the promotion of the use of energy from renewable sources. Among others, the document introduced a requirement for the minimum percentage of the next-generation biofuel of at least 0.2% in 2023, at least 1% in 2025, and at least 3.5% in 2030.
- On 20 July 2023, the Romanian government passed a law obliging fuel suppliers to produce or buy green hydrogen starting from 2025.
- On 13 September 2023, the European Parliament approved new regulations requiring electric charging pools for cars with at least a 400 kW output to be deployed along main EU roads by 2026, with the network's power output increasing to 600 kW by 2028. For trucks and buses, charging stations have to be provided every 120 km.
- On 9 October 2023, the EU Council adopted a new regulation forcing jet fuel suppliers to incorporate 2% of SAF in 2025 and 6% in 2030.

New projects

CHP construction project: approved by KMG's Investment Committee on 16 March 2020, the project will provide all the necessary steam and electricity to the Petromidia Refinery.

The reporting year saw certain delays in the overall performance under the EPC contract. On 22 March 2023, Calik Energy ("Calik"), a Turkish general contractor, suspended work due to the delay in signing Addendum No. 2 to the EPC contract and relevant payment.

On 19 January 2024, Addendum No. 3 to the EPC contract was signed providing for work completion with 37 months before 30 June 2024.

For the purposes of project benefit analysis, the initial date is 1 October 2024, which will give the parties some extra time to obtain all work permits, among other things.

Dolphin project

The Dolphin project for refineries is a programme to improve operational efficiency with a focus on continuous improvement, energy efficiency, maintenance, and organisational efficiency.

In 2012, after implementing the 2010 investment package, Rompetrol Rafinare started developing a Dolphin programme running from 2014. Its primary objective is to fully unlock the potential of Petromidia and Vega platforms. Every year, in pursuance of these goals, the company introduces sustainable improvements and enhances the existing processes to boost productivity, reduce technology losses, and deliver positive financial results.

In 2024, as part of Dolphin 8, Rompetrol Rafinare will continue to implement ideas and low-cost projects aimed at increasing energy efficiency and bettering operational performance.



Petrochemicals

KMG will be strongly involved in developing Kazakhstan's petrochemical industry with support from the government, which is expected to significantly boost the national economy as growth in the petrochemical sector will have a multiplier effect on the entire domestic market.

Key objectives of KMG's petrochemical projects:

- build the first gas chemical complex and establish a petrochemical cluster in the Republic of Kazakhstan;
- use the available large volumes of gas for the petrochemical complex;
- manufacture export-oriented products with high added value;
- produce polymers to diversify industry sectors.

Polypropylene

About KPI Inc.

Kazakhstan Petrochemical Industries Inc. Limited Liability Partnership (KPI Inc.) is the operator of Phase I of the first integrated gas chemical complex project in the Atyrau Region. Established in 2008, the Partnership has the abbreviated name KPI Inc.

Project participants: National Company KazMunayGas with 49.5%; SIBUR Holding with 40%, Samruk-Kazyna Ondeu with 9.5% (the sole member of Samruk-Kazyna Ondeu is Sovereign Wealth Fund Samruk-Kazyna. Samruk-Kazyna Ondeu was established to carry out the commission of the President of the Republic of Kazakhstan to implement projects in the chemical industry); Firm Almex Plus with 1% (a private investor, member of a major Kazakhstani holding group, Holding Group ALMEX).

KPI Inc. polypropylene production was officially launched in November 2022 as part of Phase I of the integrated gas chemical complex construction project in the Atyrau Region. Polypropylene is used as feedstock in mechanical engineering, medicine and electrical engineering, production of packaging materials, containers, fibre, pipes and fittings for hot water supply, office equipment, consumer electronics, consumer goods, outdoor and office furniture.

