

In 2022, 49 low-carbon development initiatives were implemented as planned, with annual fuel and energy savings totalling 1.504 mln GJ, including 33,448 thous. kWh in electricity, 1,531 Gcal in heat, 25,292 tonnes in boiler and heating fuel, and 7,570 thous. m³ of natural gas. This translates into a 106,965 thous. reduction in CO₂ emissions.

Intention to embed TCFD reporting

- KMG has formally announced its intention to embed reporting consistent with the TCFD principles, with a focus on assessing climate-related risks and their financial impact on the Company's operations.
- To prepare the initial disclosure, KMG has signed a memorandum of understanding with the EBRD for strategic cooperation on decarbonisation, whereby the EBRD will support KMG in drafting its first TCFD report.



HEALTH, SAFETY AND ENVIRONMENT

Industrial safety, occupational health and environmental protection

For all Samruk-Kazyna companies, 2022 was declared the Year of Safety. KMG is committed to sustainable development and takes a responsible attitude to the environment and social stability across its footprint. The Company's topmost priority is employee safety.

Sustainability principles inform the Company's economic, environmental and social development. One of KMG's key ESG

challenges is carbon emissions from operating activities and emissions from using the Company's products.

Aware of the nature and scale of our footprint, we strive to build our operations on such important principles as sustainable use of natural resources, health and safety of employees in all business lines and local communities, and environmental protection.

We have made a significant progress in improving environmental protection thanks to effective corporate standards, an eco-friendly corporate culture and continuous improvements in management. We aim to achieve a zero footprint, which means no impact on the environment whatsoever.



Participation in initiatives and programmes



CDP
CDP climate programme



WORLD BANK GROUP
The World Bank's Zero Routine Flaring by 2030 initiative



Global Methane Initiative
Global Methane Initiative



SUSTAINABLE DEVELOPMENT GOALS
UN 17 Sustainable Development Goals initiative



Caspian Environmental Protection Initiative — CEPI

Performance highlights

Social highlights

Indicator	2020	2021	2022
Lost Time Incident Rate (LTIR)	0.29 ¹	0.31	0.36
Fatal Accident Rate (FAR)	0.00	2.93	1.00
Fatalities	0	1	1

Environmental highlights

Indicator	2020	2021	2022
NO _x emissions, tonnes per 1.000 tonnes of produced hydrocarbons	0.22	0.24	0.31
SO _x emissions, tonnes per 1.000 tonnes of produced hydrocarbons	0.23	0.22	0.21
APG flaring rate, tonnes per 1.000 tonnes of produced hydrocarbons	2.2	2.1	1.5

¹ — Data without hours worked of KazTransGas.

Health, safety and environment management system

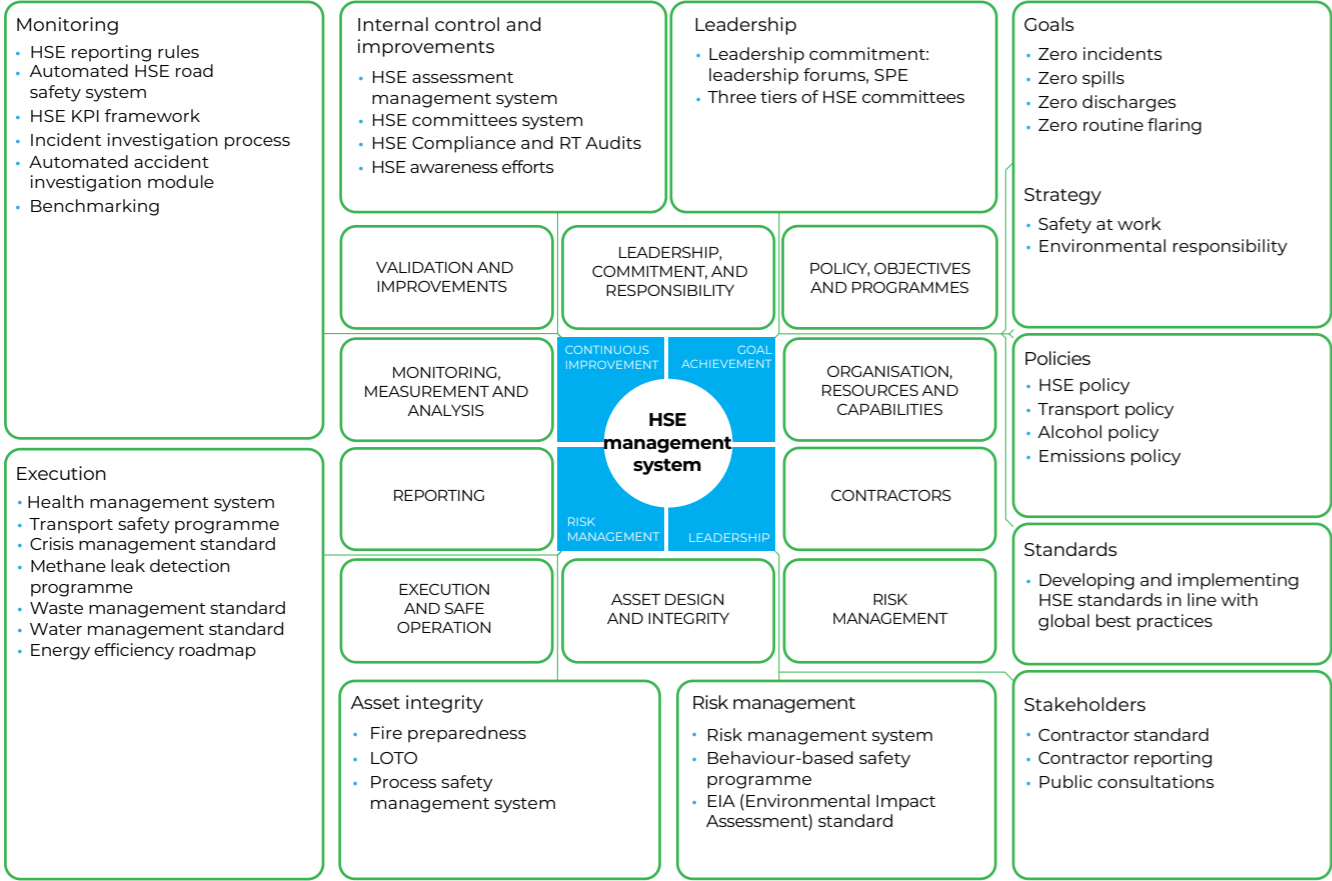
The health, safety and environment management system is designed to Kazakhstan's statutory requirements, ISO 14001 and ISO 45001 international industry standards, global best practices and guidelines, and recommendations of the International Association of Oil & Gas Producers (IOGP).

It covers ten areas and relies on four pillars: leadership, goal achievement, risk management, and continuous improvement.

Since 2006, KMG operates an integrated quality, environmental, and occupational health and safety management system compliant with ISO 9001, ISO

14001, and ISO 45001. KMG's significant energy users are certified to ISO 50001. The effectiveness of the HSE management system is verified by independent auditors on a regular basis.

To improve its management system, KMG has its HSE MS certified to ISO 45001.



Environmental responsibility and safety

KMG Group's goals in HSE management are directly related to its Development Strategy. KMG's Development Strategy until 2031 covers strategic initiatives to promote greater environmental responsibility. KMG Group's environmental priorities include management of air emissions, water resources and production waste, flaring reduction, and land reclamation.

Management teams at JSC NC KazMunayGas and its subsidiaries and associates take a zero tolerance approach to losses and harm caused by environmental pollution. In accordance with the new Environmental Code, KMG's Environmental Policy was updated in 2021 to ensure the collection, accumulation, storage, analysis, and dissemination of environmental information. In addition, JSC NC KazMunayGas enhanced its commitment to the sustainable use of natural resources and compliance with biodiversity conservation measures.

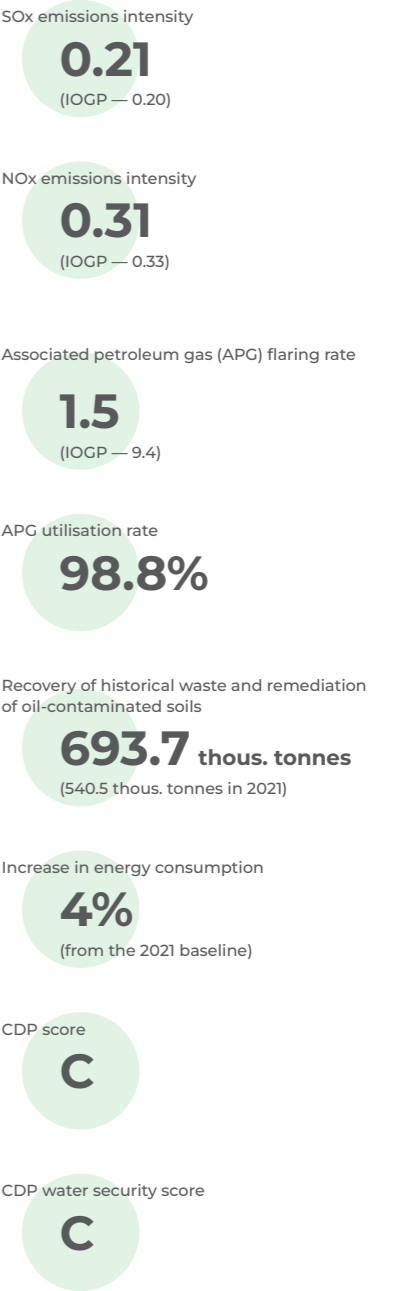
In an effort to minimise raw gas flaring, in 2015 the Company supported the World Bank's initiative Zero Routine Flaring by 2030.

In reducing our air emissions, we focus on increasing associated petroleum gas utilisation while minimising flaring. Raw gas flaring reports under the Initiative are submitted on an annual basis to the World Bank's representative office in Kazakhstan.

As a result of its efforts to improve environmental performance and ensure openness and transparency in that area, KMG has topped, for the sixth consecutive year, the Environmental Transparency Rating of Oil and Gas Companies in Kazakhstan compiled by independent experts from the World Wildlife Fund (WWF), Creon Group, and Analytical Credit Rating Agency.

The Company remains committed to being an environmentally responsible business, further enhancing its environmental protection management system, maintaining dialogue with all stakeholders on this matter, and thus delivering on its commitments as stated in the Company's Environmental Policy.

2022 highlights



Environmental performance indicators, tonnes per 1.000 toe of produced hydrocarbons

Year	2020	2021	2022
SOx emissions intensity	0.23	0.22	0.21
NOx emissions intensity	0.22	0.24	0.31
Raw gas flaring rate	2.2	2.1	1.5
Raw gas utilisation, %	98	98	98.8





PRIORITY ENVIRONMENTAL PROJECTS

Eliminating legacy pollution

Elimination of historical pollution, as well as sources of negative environmental impact (idle wells, wastewater reservoirs, landfills and other production facilities).

Reducing atmospheric emissions

Reduction in emissions through improved technology solutions, e.g. replacing fuel oil with fuel/natural gas used as a process furnace fuel, using next-generation additives, tree planting and land improvement at production facilities, replacing equipment, expanding gas processing capacity, installing gas processing units, etc.

Project: Tazalyq

The Tazalyq project provides for the upgrading of Atyrau Refinery's wastewater treatment facilities as well as the reclamation of the Tukhlaya Balka evaporation fields.

Formation water desalination plant at the Karazhanbas field

The plant plays a strategic role in the region and is expected to make the field self-sufficient in terms of water supply and free up significant amounts of water for local residents.

Automated environmental monitoring information system (AEMIS)

The project's purpose is to create a shared information space in environmental protection. It seeks to provide a shared information resource in environmental protection, increase transparency and expediency while also minimising human error to avoid potential environmental fines.

- The AEMIS focuses on:
- automated generation of environmental reports to government agencies;
 - maintaining the database of authorisation regulations and calculating environmental emission fees;
 - prompt response to potential excess emissions by timely eliminating faults in production processes;
 - day-to-day environmental monitoring based on environmental controls on production sites;
 - generating HSE KMG-synchronised corporate reports.

Recovery of historical oil wastes and oil-contaminated soil treatment

Complete disposal of historical oil waste and oil-contaminated soil treatment through 2024.

KMG is aware of the importance of its environmental impact and strives to minimise it.

In 2022, a number of activities were implemented to ensure environmental safety, such as working to dispose of historical oil waste and decontaminate oil-contaminated soils, stepping up efforts to promote environmental protection issues among employees, participating in tree planting events, developing action plans to reduce atmospheric emissions, implementing environmental protection programmes, and other activities.

In June 2022, KMG took part in a conference on Responsible Business for Sustainable Development attended by ecologists from more than 180 of the country's industrial enterprises and global organisations. The event was aimed at strengthening cooperation and facilitating experience sharing between the enterprises and global organisations on pressing environmental, climate change and regulation issues. It was timed to take place shortly before World Environment Day on 5 June.

A number of our subsidiaries and associates installed automated air monitoring systems in sanitary protection zones and near pollution sources to control the environment.

Employee training in environmental management

People are our most important asset, so HSE training remains top of mind for KMG Group. Therefore, mandatory staff education, training and upskilling in occupational health, industrial and fire safety and environmental protection are priority training areas for KMG.

Starting from 2021, KMG's Corporate Centre employees undergo mandatory training in occupational health and industrial and fire safety basics. The sessions are held on the platform of KMG Engineering.

In 2022, KMG Group spent a total of KZT 504,548.6 thous. to train 79,071 employees, including HSE training in the following key business segments: KZT 243,410.7 thous. in the upstream business; KZT 40,642.6 thous. in the midstream business; KZT 100,115.4 thous.



in the downstream business; KZT 116,316.4 thous. in the service business, and KZT 4,063.5 thous. in the Corporate Centre.

The companies that have their own training facilities/centres include Ozenmunaigas (Zhanaozen), KazTransOil (Aktau) and Oil Services Company (Aktau).

Employee training expenses

Indicator	2020	2021	2022
Employees trained	89,715	61,678	79,071
Amount in KZT '000	578,891	498,714	504,548.6

HSE training by key business segment

Business segment	Number of employees	Amount in KZT '000
Upstream	35,370	243,410.7
Midstream	7,488	40,642.6
Downstream	16,075	100,115.4
Service	19,919	116,316.4
KMG Corporate Centre	219	4,063.5

Energy saving and energy efficiency programmes

Using energy resources and improving energy efficiency

KMG's energy saving and energy efficiency efforts are based on the methodology set out in ISO 50001 Energy management systems, an internationally recognised best-practice framework for systemic energy management.

In December 2022, as part of its Low-Carbon Development Programme for 2022–2031, KMG approved the Energy Policy applicable to all its subsidiaries, associates and contractors.

The Policy supports energy efficient procurement and projects, defines roles and responsibilities in energy management, and promotes economically feasible best available techniques, international practices, standards and administrative resolutions to improve energy efficiency and saving. An integral part of KMG's 2022–2031 Low-Carbon Development Programme, the Policy lays foundation for setting and reviewing energy-related goals and objectives.

In December 2022, all KMG subsidiaries and associates approved similar policies and aligned their internal documents with KMG's Energy Policy.

Energy consumption

The Company's Corporate Centre collects and analyses energy consumption and energy efficiency-related data, monitors the dynamics, identifies opportunities for improvement, and conducts year-on-year and peer benchmarking (IOGP).

In 2022, total energy consumption amounted to 132.11 mln GJ (4,341.5 thous. tonnes of reference fuel), up 4% year-on-year, including 13.23 mln GJ in electricity, 3.54 mln GJ in heat, 1.56 mln GJ in motor fuel, and 113.78 mln GJ in boiler and heating fuel (with oil refinery gas, natural gas, stripped gas and associated petroleum gas

accounting for 34%, 22%, 14% and 11% of the total energy consumption, accordingly). The total energy consumption is divided among three business segments: Upstream, Midstream, and Downstream.

An increase in energy consumption is due to the Kalamkas gas turbine power plant reaching its nominal capacity after repairs, and a 20% rise in oil refining at PKOP.

In 2022, KMG Group's self-generated energy amounted to 702.6 mln kWh in electricity and 4,841 thous. Gcal in heat.

In accordance with the Rules for Determining the Tariff for the Support of Renewable Energy Sources, Atyrau Refinery and Mangistaumunaigaz purchased in 2022 from Financial Settlement Center of Renewable Energy LLP for internal use 11,929 thous. kWh of electricity produced by renewable energy facilities. In 2022, PKOP solar panels generated 75 thous. kWh of electricity for street lighting.

Reducing energy consumption

A total of 265 initiatives were implemented under KMG's Energy Saving and Energy Efficiency Action Plan for 2017–2021, producing an aggregate fuel and energy saving effect of 101,478 tonnes of reference fuel (about 3 mln GJ), an equivalent of 229,490 tonnes of CO2 in emission cuts. Overall spending under KMG's Energy Saving and Energy Efficiency Action Plan for 2017–2021 was KZT 10,801 mln.

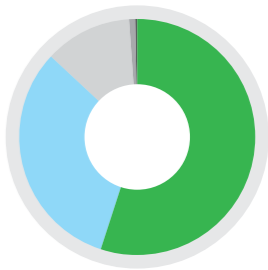
KMG Group's key strategic energy saving and energy efficiency initiatives include process equipment upgrades, deployment of energy saving technologies, optimisation of heat generation and consumption, and the development of the Group's own generation assets, including APG-fired generation.

In 2022, 49 initiatives were implemented as part of the Action Plan to implement the Low-Carbon Development Programme.

The estimated annual fuel and energy savings amounted to 2.057 mln GJ, which in physical terms corresponds to 33,448 thous. kWh of electricity, 1,531 Gcal of heat energy, 25,292 tonnes of boiler and heating fuel and 21,732 thous. m³ of natural gas, an equivalent of 136,703 tonnes of CO2 in emission cuts. Overall spending on the energy saving and energy efficiency initiatives was KZT 10,355 mln.

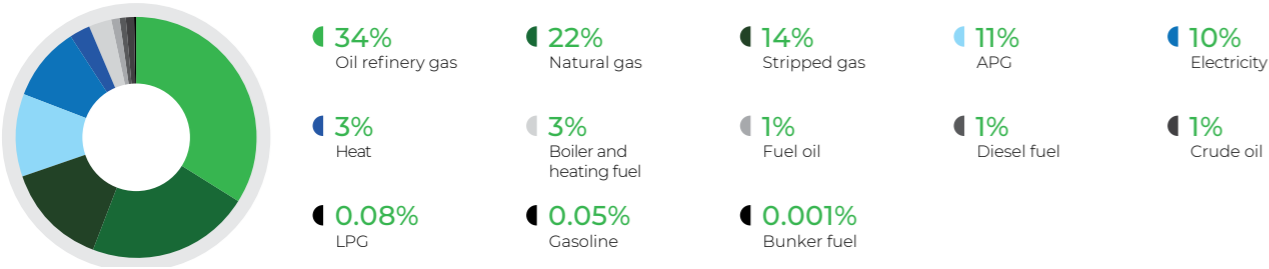
In December 2022, Samruk-Kazyna approved an Energy Saving and Energy Efficiency Programme until 2027, with more than 55% of its energy saving potential represented by KMG as estimated in the Action Plan to implement the Low-Carbon Development Programme approved by the Company's Management Board in May 2022.

Structure of the energy saving potential under Samruk-Kazyna's Energy Saving and Energy Efficiency Programme until 2027, tonnes of reference fuel

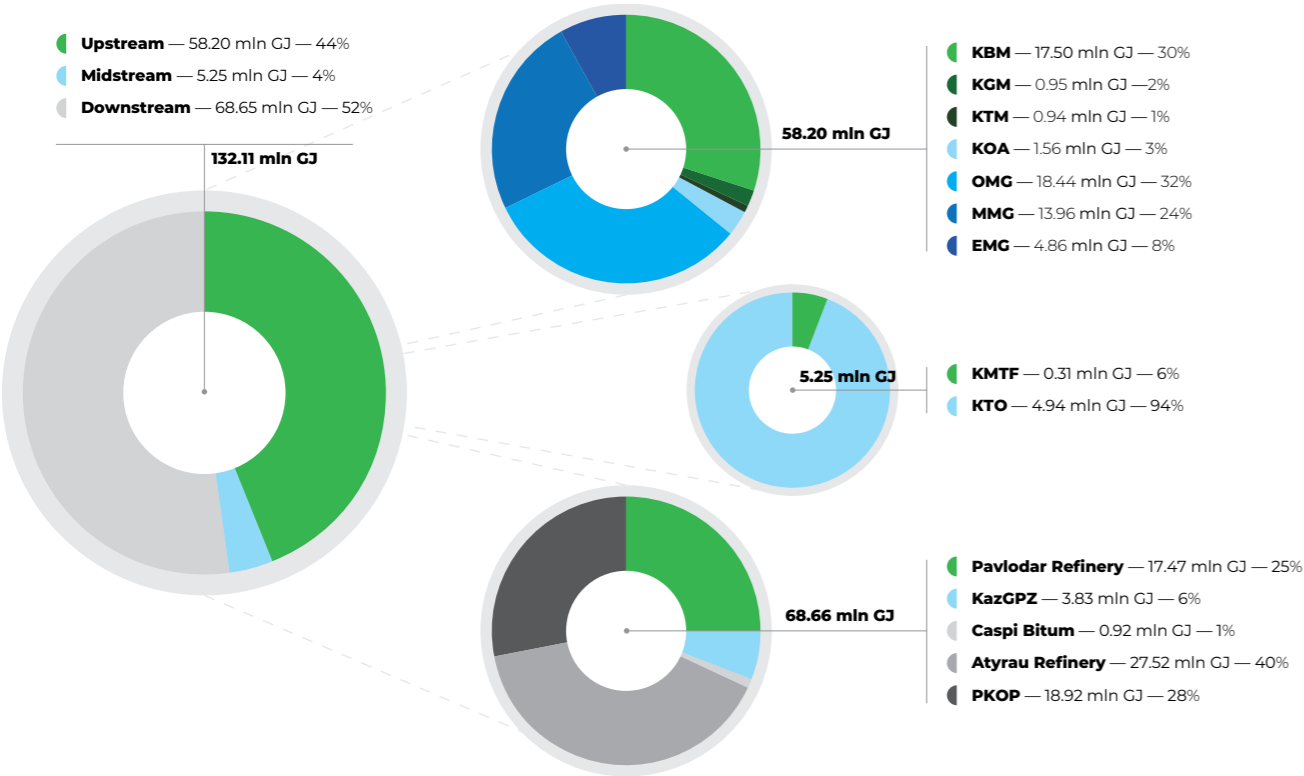


- 400 KMG
- 230.7 Samruk-Energy
- 85.3 QazaqGaz
- 7 Kazakhstan Temir Zholy
- 0.9 Kazatomprom

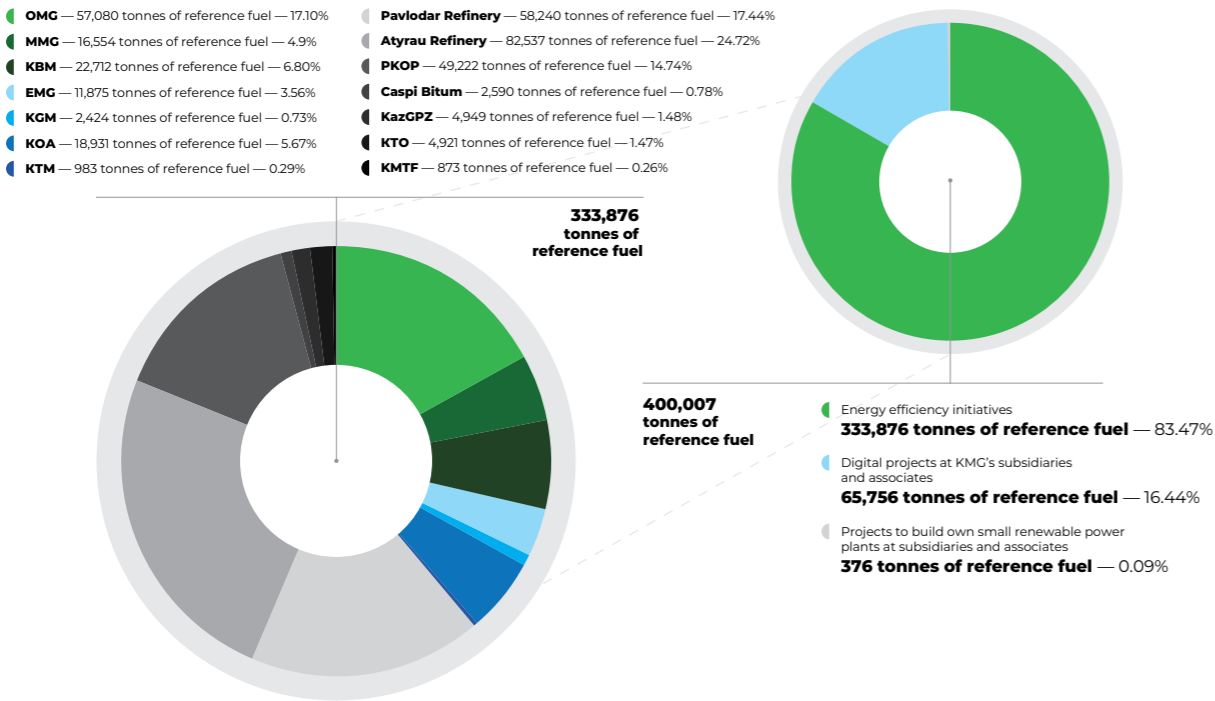
Energy consumption by resource type



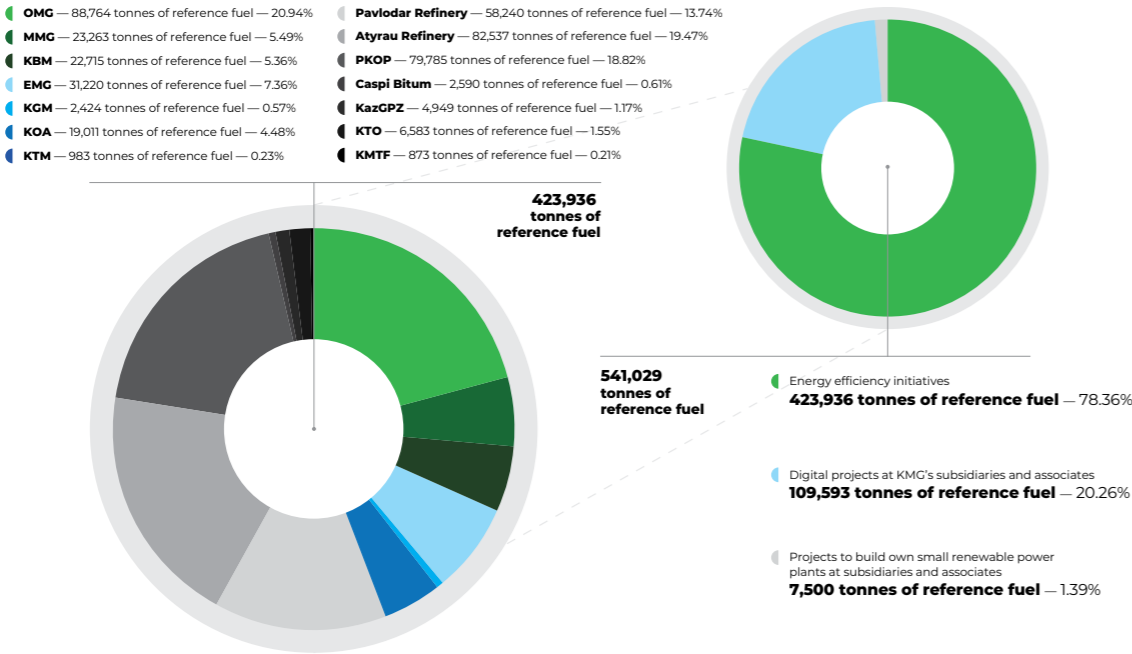
Energy consumption by business segments



In particular, the action Plan states KMG's energy saving potential for 2027 at 400 thous. tonnes of reference fuel (about 11.7 bln GJ), or 10.2% of its total energy consumption in 2021. Energy saving initiatives at subsidiaries and associates account for 83.5% of this potential, while 16.4% is associated with digital projects.



At the same time, the Action Plan to implement KMG's Low-Carbon Development Programme for 2022–2031 embraces around 300 initiatives to be carried out at subsidiaries and associates. By 2031, energy savings from these initiatives are expected to total 541 thous. tonnes of reference fuel (15.85 mln GJ), or 13.7% of KMG's overall energy consumption in 2021.



Energy intensity

In 2022, KMG Group's energy consumption in the upstream sector averaged at 2.78 GJ per tonne of hydrocarbon production, still 85% above the International Association of Oil & Gas Producers (IOGP) average for 2021, i.e. 1.5 GJ per tonne of hydrocarbon production.

KMG Group's average does not reflect the status quo because of a severe distortion owing to high energy intensities at OMG and KBM. KBM's energy consumption per tonne of produced hydrocarbons is 4.5 times higher than the IOGP global average, as production at the Karazhanbas field requires the use of steam and hot water to displace oil from subsoil reservoirs. At OMG, the measure is

more than double the IOGP global average as a result of high dissolved paraffin concentrations and the rheological properties of oil, which means that it needs to be heated during production and transportation in both winter and summer.

Renewable energy

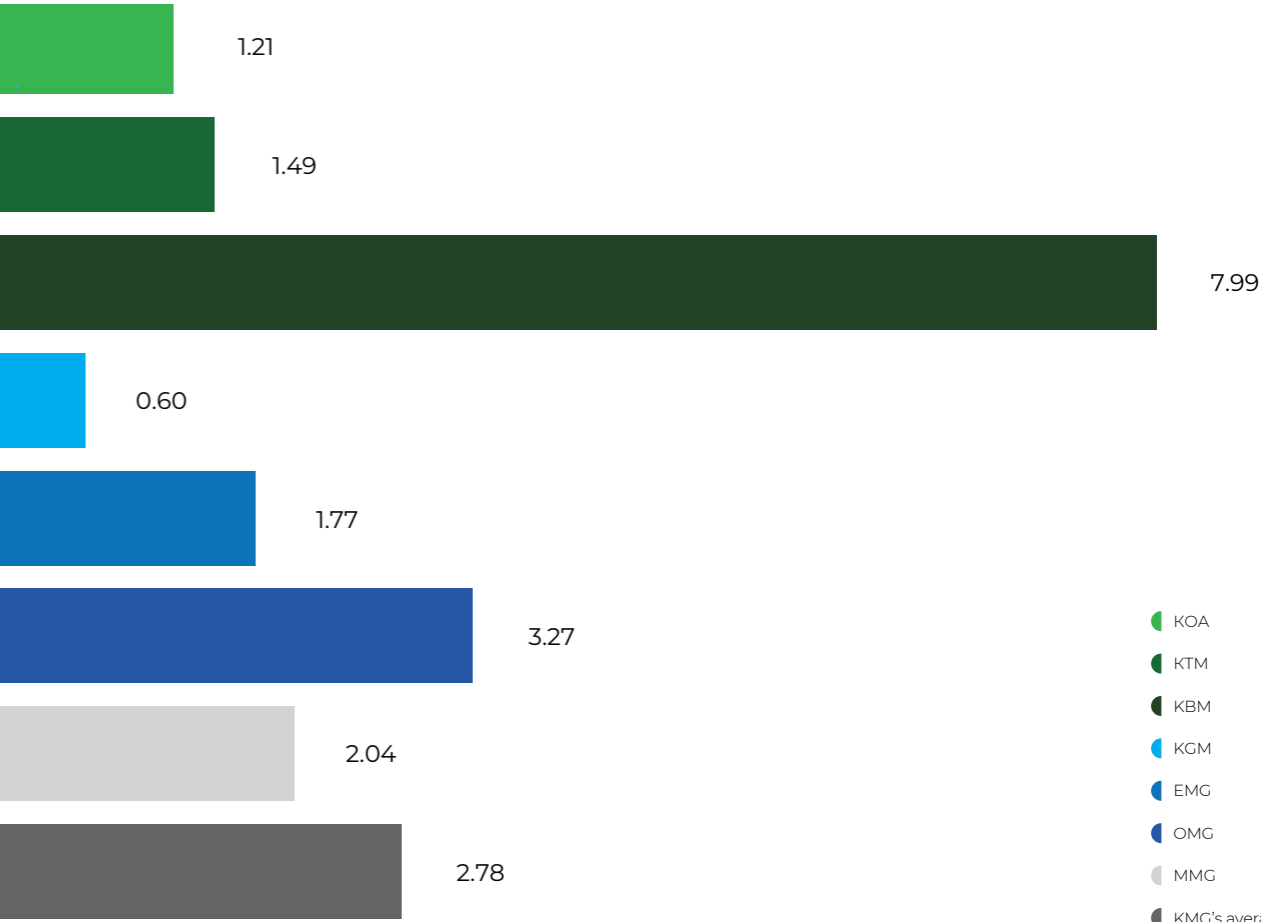
In addition to energy efficiency and energy saving, the Action Plan to implement KMG's Low-Carbon Development Programme places a special emphasis on renewable energy projects and the offset policy, which are expected to help reduce our carbon footprint by 550 thous. tonnes of CO₂.

Currently, KMG has started to develop a feasibility study and explore the wind power potential in the Zhambyl Region, where a 1 GW wind power plant with an energy storage system is planned to be built jointly with Total Eren and Samruk-Kazyna.

The unit capacity of the future wind power plant will account for a half of the total capacity of all existing renewable energy power plants in the country.

KMG carries out similar work to construct a 120 MW hybrid power plant (solar + wind) in the Mangistau Region jointly with Eni.

Energy intensity





Climate change and greenhouse gas emissions

Management

KMG’s long-term Development Strategy prioritises the following climate-related initiatives:

- 1. Greenhouse gas emissions management
- 2. Reduction of routine flaring
- 3. Improvement of GHG emissions intensity per unit of production and overall energy efficiency;
- 4. Reduction of methane leaks
- 5. Increased financing for green projects

The global trend to fight climate change is increasingly affecting companies across the world. In furtherance of the government policy on the low-carbon development of the country, KMG has approved its 2022–2031

Development Strategy, which meets high safety standards and the sustainable development principles. According to KMG’s Development Strategy, gradually reducing the carbon footprint is one of the Company’s key priorities.

In addition to the Programme’s main focus on improving the energy efficiency of the operating processes and implementing renewable energy projects, the Company is also planning to implement additional decarbonisation measures, specifically: carbon capture, utilisation and storage (CCUS) projects, development of hydrogen energy, and implementation of forest-climate projects.

Risks and opportunities

The corporate risk management system is a key component of the corporate governance system, and is used to identify, evaluate, monitor and mitigate potential risks that may hinder the achievement of strategic goals. The Company implements a range of initiatives to minimise such risks, with risk reports submitted to the Board of Directors on a quarterly basis.

Indicator	2019	2020	2021
Scope 1 direct emissions, tonnes CO ₂	7,360,760	6,736,684	6,902 065 ¹
Location-based Scope 2 indirect emissions, tonnes CO ₂ e	3,304,832	3,448,136	3,340,709
Market-based Scope 2 indirect emissions, tonnes CO ₂ e	3,359,945	3,508,371	3,314,720

Information disclosure

In the CDP’s Climate Change Questionnaire, KMG discloses direct and indirect greenhouse gas emissions data, greenhouse gas management issues, and key risks and opportunities for all KMG assets, including international assets in Romania and Georgia, starting from 2019.

In July 2022, the KMG Climate Change 2021 Questionnaire was published. According to the report, the direct carbon dioxide emissions at KMG Group’s level totalled 6.9 mln tonnes of CO₂ in 2021.

The greenhouse gas emissions data were verified by independent accredited organisations’ reports for each subsidiary or associate. Data for 2022 will be disclosed in KMG’s CDP report to be published in 3Q 2023. We are committed to enhancing our disclosures and seek to ensure consistency and comparability when preparing them.



For more details on air protection, see the Sustainability Report.



Efficient use of raw gas

The management of pollutant and greenhouse gas emissions and the reduction of gas flaring are among the priority tasks for KMG Group. According to the approved Environmental Policy, the Company strives to achieve zero routine gas flaring and reduce atmospheric emissions from flares. In reducing our GHG footprint, we focus on increasing raw gas utilisation and recovery while minimising flaring. The measures taken so far under our raw gas processing and development programmes have increased internal gas use for heat and electricity generation. This contributed to a reduction in emissions of pollutants and greenhouse gases generated by the combustion and dispersion of raw gas.

In 2022, raw gas utilisation rate was 98.8%, with flaring 89% below the 2017 level at 1.5 tonnes per 1,000 tonnes of produced hydrocarbons (2.1 tonnes in 2021 and 2.2 tonnes in 2020), down 29% year-on-year and 84% lower than the IOGP industry average.

In 2015, KMG supported the World Bank’s Zero Routine Flaring by 2030 initiative. KMG strives to minimise raw gas flaring. Raw gas flaring reports under the Initiative are submitted on an annual basis to the World Bank’s representative office in Kazakhstan.

Raw gas flaring

Indicator	2020	2021	2022
Total raw gas flaring, mln m ³	57.6	52.5	35.7
Raw gas utilisation, %	98	98	98.8
Raw gas flaring rate, tonnes per 1,000 tonnes of produced hydrocarbons	2.2	2.1	1.5



For more details, see KMG’s Sustainability Report



¹ — Of that amount, 6,734,279 mln tonnes of CO₂ were verified, with the remaining 167 thous. tonnes of CO₂ coming from units not covered by quotas calculated by the Company.



Waste management

KMG’s production operations generate production and consumption waste. KMG Group develops and implements a set of measures to improve the waste management system, keeps records of waste generated and accumulated, including contractors’ waste, and performs the safe accumulation of waste until it is recovered or disposed of. In 2022, KMG’s expenses for the recovery of waste generated and accumulated totalled KZT 14.37 bln.

It is important to emphasise that in selecting waste recovery methods, priority is given to modern technologies, including those that cause no secondary pollution of the environment.

On 6 August 2019, a memorandum of cooperation was signed by and between the Ministry of Ecology, Geology, and Natural Resources of the Republic of Kazakhstan and KMG with historical oily waste disposal and oil contaminated soil remediation commitments until 2024, inclusively. The memorandum covers Mangistaumunaigaz, Ozenmunaigas, and Karazhanbasmunai.

Starting September 2019, inventories of contract lands were conducted to determine waste characteristics, the content of oil products in the waste, and the waste volume. On the basis of the inventories data, the relevant remediation projects for oil-contaminated soil were developed and agreed upon with the government authorities, with safe and

efficient technologies for oily waste disposal selected and recommended and schedules drawn up for oil-contaminated soil remediation through the year 2024, inclusively.

In addition, although Embamunaigas and Kazakhturkmunay are not covered by the commitments under the memorandum, they work to eliminate historical pollution too.

All of the above companies have entered into long-term contracts with organisations specialising in the disposal of historical oily waste and clean-up of oil-contaminated soil.

In 2022, a total of 693.7 thous. tonnes of historical waste was disposed of at KMG subsidiaries’ and associates’ facilities, with their disposal sites remediated.



For more details on waste management, see KMG’s Sustainability Report.

Asset retirement obligations

Oil and gas assets

Under the terms of certain contracts, in accordance with legislation and regulatory legal acts, KMG has legal obligations to dismantle and liquidate fixed assets and restore land plots at each of the fields. In particular, KMG’s obligations include the gradual closure of all non-productive wells and actions to permanently terminate operations, such as dismantling pipelines, buildings and reclamation of the contract area,

as well as decommissioning and obligations to prevent environmental pollution at the production site.

The Company calculates asset retirement obligations separately for each contract. The amount of the liability is the present value of the estimated costs that are expected to be required to settle the liability, adjusted for the expected inflation rate and discounted using average

long-term risk-free interest rates on government debt of transition economies, adjusted for risks inherent in the Kazakhstan market.

As of 31 December 2021, the carrying amount of the Company’s provision for liabilities to liquidate oil and gas assets was KZT 67 bln (31 December 2020: KZT 66 bln) (for details, see Note 4 in the consolidated financial statements).

Oil and gas trunklines

In accordance with the Law of the Republic of Kazakhstan On Trunk Pipeline, which entered into force on 4 July 2012, KMG’s subsidiary KazTransOil has a legal obligation to liquidate the trunkline after the end of operation and implement subsequent measures to restore the environment, including land reclamation. The provision for the obligation to abandon pipelines and land reclamation is estimated based on the cost of dismantling and reclamation works calculated by KMG. As of 31 December 2022,

the carrying amount of KMG Group’s provision for the obligation to abandon pipelines and reclaim land of the Company amounted to KZT 41 bln (as of 31 December 2021: KZT 36 bln) (for details, see Note 4 in the consolidated financial statements).

Environmental remediation

KMG also makes estimates and makes judgements on creating provisions for obligations for environmental clean-up and rehabilitation.

Environmental costs are capitalised as an expense based on or attributable to their future economic benefits.

The Company’s environmental remediation provision represents management’s best estimates based on an independent assessment of the expected costs required for KMG Group to comply with the existing Kazakh and European regulatory frameworks. As of 31 December 2021, the carrying amount of the provision for environmental liabilities was KZT 63 bln (31 December 2020: KZT 65 bln) (for details, see Note 26 in the consolidated financial statements).



Water protection

Water is an integral part of all KMG production processes. In its activities, the Company strives to reduce water consumption, increase water use efficiency, drive up water reuse and recycling, improve the quality of effluents, and minimise the impact on natural water bodies.

KMG is a vertically integrated company engaged in the production, transportation, and processing of hydrocarbons. All processes consume a lot of water. KMG takes water from surface and underground sources, municipal water supply systems, and the Caspian Sea. Wastewater from KMG’s operations mainly goes to specialised receivers: storage ponds, and evaporation and filtration fields. Those facilities are technical structures designed for natural treatment of wastewater and preventing environmental pollution.

Operations that do not have their own storage facilities transfer wastewater to dedicated companies for treatment and disposal. The quality standards for discharged water established by environmental laws are met through the use of mechanical and biological methods of effluent treatment. However, no wastewater is discharged into surface natural water bodies.

In 2023, KMG Group’s Water Resources Management Programme is planned to be developed and approved.

The Tazalyq project is one of the key ongoing environmental initiatives of Atyrau Refinery. It includes two stages, which are an upgrade of the refinery’s mechanical treatment facilities and the channel for wastewater treated to standard quality (construction of a pipeline), and reclamation of the evaporation fields (860 ha).

The fields upgrade is phased, dividing the 860 ha site into four sectors.

- The first phase (from June 2021 to August 2022) involved the draining and remediation of sectors 1 and 2 and construction of the pipeline, which took the channel’s place.
- During the second phase (from September 2022 to December 2023), sectors 3 and 4 will be drained and remediated to complete the reclamation of the Tukhlaya Balka evaporation fields.

The pipeline to Atyrau’s sewage treatment plants has been laid in full. Sectors 1 and 2 of the fields have been drained completely, with a biological agent now being introduced there. The fields reclamation is expected to be completed in late 2023.



Construction of desalination plants near the Kenderly recreational area, Mangistau Region

KMG is implementing a project to build a 50,000 m3 per day seawater desalination factory with a trunk pipeline next to the Kenderly recreational area. The purpose of the project is to provide drinking water to the population of the city of Zhanaozen to address the existing water shortage and reduce the load on the Astrakhan – Mangyshlak main water pipeline. At the moment, the project is planned to be implemented in 2021–2024.

Karazhanbasmunai

On 1 July 2022, test operation started at the formation water desalination plant at the Karazhanbas field. The

strategically important facility is now running in normal mode in line with technical standards.

Karazhanbasmunai uses Volga River water from the Astrakhan – Mangyshlak water pipeline. The plant is set to make the field self-sufficient in terms of water supply and free up significant amounts of water for local residents. At full capacity, it will boast a throughput and output of 42.5 thous. and 17 thous. m3 per day respectively.

This facility creates a multiplicative effect in a variety of areas. In addition to providing water supply, it is expected to help Karazhanbasmunai increase production volumes, reduce the need for well workovers and services, and cut cratering rates.



KMG Group's water footprint and water management disclosures were posted on the CDP's website as part of the 2021 Water Security Questionnaire. Data for 2022 will be disclosed in 3Q 2023.

For more details, see KMG's published reports, which are publicly available at: CDP 2021 Water Security Questionnaire



For more details on KMG's water management and related projects, see KMG's Sustainability Report.



Occupational health and safety

KMG and its subsidiaries and associates prioritise the life and health of employees over the results of production activities and put a special emphasis on the elimination of hazardous production factors in occupational health and safety.

KMG's Occupational Health and Safety Policy seeks to engage every employee in building a robust safety culture. Management teams at KMG and its subsidiaries and associates take a zero tolerance approach to losses and damage caused by accidents (including traffic accidents), emergencies, as well as by the use of

alcohol, narcotic drugs, psychotropic substances or their analogues. KMG is committed to ensuring compliance with both national laws and relevant international and national standards. The Company will continue to work to ensure a high level of production safety in accordance with global standards and best practices.

Accident and fatality rates

Indicator	2022	2021	2020	IOGP ¹
Lost Time Incident Rate (LTIR), per mln person-hours	0.36	0.31	0.29 ²	0.19
Fatal Accident Rate (FAR), per 100 mln person-hours	1.00	2.93	0.0	0.29

2022 highlights

As one of the industry leaders in Kazakhstan, KMG places a strong emphasis on health and safety of its employees and local communities across its footprint. According to our employees, the Company creates safe working conditions and complies with the highest standards to ensure health and safety at the workplace.

In 2022, the number of work-related fatalities decreased by 67% year-on-year (from 3 fatal accidents in 2021 to 1 in 2022). There was one fatal work-related accident where one employee died (as a result of a rupture of the Aktau–Zhetybai water pipeline of the Water Production and Transportation Department, Mangistau Region).

The number of injuries associated with workplace accidents went up by 12.5% year-on-year (from 32 injuries in 2021 to 36 in 2022). The number of road accidents dropped by 4.5% (from 22 in 2021 to 21 in 2022), while the number of fires fell by 83% (from 6 in 2021 to 1 in 2022).

Key highlights	Unit	2020	2021	2022	Change 2022/2021	%
Accidents	Acc.	30	28	35	7	25
Number of injuries	People	32	32	36	4	12.5
Including fatalities	People	0	3	1	–2	–67
Road accidents	Acc.	14	22	24	2	9
Fires	Acc.	6	6	1	–5	–83

¹ — Available data on the International Association of Oil & Gas Producers (IOGP) performance indicators for 2021 (<https://www.iogp.org/>).
² — Data without hours worked of KazTransGas.

Process safety management

As part of its efforts to implement KMG Group's Corporate Standard for Process Safety Management and improve safety culture at subsidiaries and associates, the Company held workshops at its Corporate Centre and major subsidiaries and associates (Ozenmunaigas, Mangistaumunaigas, Embamunaigas) for managers and engineering and technical employees responsible for industrial safety (128 employees in total).

During these workshops, employees were informed on measures to organise and ensure safety of

production processes / manage barriers taking into account best global practices in the oil and gas industry (TCO) and the IOGP recommendations.

In addition, the participants reviewed case studies of preventive safety barriers for each of KMG's business segments with due regard to the nature of relevant operations.

The final part of the workshops focused on the main tools (ways) to check and assess barriers in KMG subsidiaries and associates (based

on existing methods, programmes and practices), and the roles and responsibilities of KMG's and its subsidiaries and associates' staff in managing process safety/barriers.

In 2023, along with further work in this area the Group plans to start implementing the IOGP Process Safety Fundamentals across KMG subsidiaries and associates.

Transport safety

In terms of road accident statistics, noteworthy are risk factors for accidents that are beyond control of the Company. One such factor is a large number of vehicles – more than 11,000 across the Company. The second factor is the geography of the Company's subsidiaries scattered across the Republic of Kazakhstan, as well as their location in big cities and towns where there is a high risk of road accidents due to the fault of a third party. For example, 14, or 58%, of 24 road accidents that occurred in 2022 were caused by third parties.

To reduce the risk of road accidents, the Company implemented the following set of measures to ensure transport safety.

- In 2022, 368 employees of KMG subsidiaries and associates (Karazhanbasmunai, Oil Transport Corporation, KMG-Security) were trained in defensive driving.
- An action plan to improve transport/road safety at KazMunayGas was drafted and submitted for consideration.

- A Trip Management project was piloted by Embamunaigas. Given the positive effect in terms of Embamunaigas transport safety following the launch of the Trip Management automated vehicle monitoring system, the Trip Management project is to be rolled out in stages from 2023 to 2025 to Ozenmunaigaz, Mangistaumunaigaz, Karazhanbasmunai, KazTransOil, Oil Services Company, Oil Transport Corporation, and KMG Service.

Fire safety

In 2022, one fire occurred in KMG Group (in 2021, there were six fires, of which three fires resulted in injuries, fatalities and significant material damage), in the area of 8 m2 in the technical trailer on the territory of the Drilling Works Department, with no injuries and the damage of KZT 195,000. The fire was caused by violations in the operation of electrical equipment.

To strengthen compliance with fire safety requirements, KMG developed and approved the Integrated Fire Safety Action Plan for 2022–2024, providing for short-, medium-, and long-term measures as well as preventive initiatives.

In accordance with the integrated plan and in preparation for the fire season, a comprehensive fire drill

was held at Mangistaumunaigas field on 1 April 2022. The event was attended by the Vice Minister for Emergency Situations of the Republic of Kazakhstan, management teams of the Emergency Situations Department in charge of four Kazakhstan regions, and KMG Health, Safety and Environment Department.

On 7 October 2022, the representatives of Samruk-Kazyna, the Ministry of Emergency Situations and the Ministry of Energy attended similar fire drills at the Mangistau Oil Pipeline Department of KazTransOil.

The reporting year saw scheduled fire drills held in all subsidiaries and associates.

In May and September 2022, KMG Corporate Centre conducted fire drills involving people evacuation and extinguishing of a simulated fire in the building.

To provide methodological assistance and ensure fire safety, KMG subsidiaries and associates drafted and circulated letters explaining fire safety standards and reminding of increased fire safety measures during fire, heating, and holiday seasons. Regional seminars on

measures to improve fire safety in KMG Group were also held in Astana, Zhanaozen, Aktau and Atyrau.

The following initiatives are planned for 2023 to improve fire safety:

- implementing mid-term measures under the Integrated Fire Safety Action Plan for 2022–2024;
- checking the preparedness of subsidiaries and associates and private firefighting services to prevent and extinguish fires at the Company's facilities.

Digitisation of HSE processes

Trip Management project

The reporting year saw the completion of a pilot project to implement an automated vehicle monitoring system. The Trip Management project initiated to improve transport safety, foster a safe driving culture, and establish a single centralised digital platform yielded the following results:

- speed limit violations reduced by 62%;
- 591 speed limit signs installed/ updated on roads of EMG production units;

- a rating on the basis of scores for the driving style and recorded violations introduced;
- an up-to-date electronic map of field and unpaved roads and coordinates of EMG field facilities drawn;
- a new functionality implemented (trip tickets, deviations from the route, online notifications).

KMG plans a phased rollout of the Trip Management project to other subsidiaries and associates. Next steps:

- analysing the maturity of processes in subsidiaries and associates with account of the level of automation and availability of GPS trackers;
- preparing individual programmes to develop transport management processes in each subsidiary and associate;
- introducing the transport management system in phases with a focus on road safety.

Improving the HSE management system

To protect the life and health of employees during the operation and maintenance of land vehicles, prevent road accidents and reduce their severity, the Group updated and approved the Policy for Safe Operation of Land Vehicles and the Regulations for Safe Operation of Land Vehicles. All subsidiaries and associates initiated and approved similar internal documents. The

requirements of the Policy and Regulations were explained and communicated to all employees via email and/or at briefings.

On 1 March 2022, KMG officially joined Vision Zero, a global campaign for zero accidents.

It presents a transformational approach to prevention that integrates the three dimensions of safety, health and well-being at all levels of work. The Vision Zero concept developed by the International Social Security Association (ISSA) is flexible and can be adjusted to the specific safety, health or well-being priorities for prevention in any given context.

It implies a sequence of actions required for employers to keep workers as safe as possible and create optimal working conditions for them, while also calling for stronger employee accountability for keeping both themselves and their colleagues safe.

In 2018, KMG decided to join the International Association of Oil and Gas Producers (IOGP) as a full member.

Over the years of its membership in IOGP, KMG has learnt and applied IOGP best global practices and recommendations, which has had a positive effect on KMG's performance and overall HSE management system, as well as KMG's capabilities and rating on the international scale. In 2022, KMG adopted IOGP's universal Life-Saving Rules to replace group-wide Golden Rules previously in effect.

Since 1991, IOGP has analysed 2,000 fatal accidents at some 100 IOGP member companies and identified the most frequent safety violations.

To prevent these violations, nine vital life-saving rules have been drafted to inform workers of actions they can take to protect themselves and their colleagues from fatalities.



For more details on occupational health and safety, see KMG's Sustainability Report.



Occupational health and hygiene

The Company manages occupational health and hygiene matters in accordance with Kazakh laws and international occupational health standards. KMG is strongly focused on employee health protection and improvement, irrespective of the specific production process involved.

The number of non-injury related fatalities among employees of subsidiaries and associates reduced by seven incidents,

or 46%, year-on-year, the main reason behind these fatalities being cardiovascular diseases.

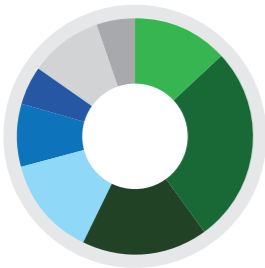
As part of strategic initiative 24 Personnel Health Management under the KMG Development Strategy for 2022–2031, the Company developed and approved internal documents on occupational health and hygiene:

- Employee Health Management Programme;

- Corporate Standard on Mandatory Medical Examinations;
- Regulations on Drafting a Group-wide Standard Programme of Occupational Hygiene.

To pursue relevant goals, KMG Group will approve an Employee Health Management Action Plan for 2023–2025.

Fatalities not related to injuries



20 2015	41 2016	26 2017
21 2018	13 2019	8 2020
15 2021	10 2022	



For more details on employee health management, see KMG's Sustainability Report.

PERSONNEL DEVELOPMENT

Social responsibility

KMG's Code of Corporate Social Responsibility is developed according to the Company's Development Strategy to ensure social stability of operations, provide social support to employees, contribute to the development of the regions of operation, promote social partnership, and grow human capital.

The Company achieves its key social responsibility objectives through the existing systems of internal communications between employers and employees, cooperation with local executive bodies and trade unions, and fair collective bargaining with employees.

KMG complies with the legal and regulatory requirements applicable in the Republic of Kazakhstan, as well as with international laws and treaties regulating oil companies, and is aware of its responsibility to shareholders, communities, and investors for the impact on the economy, environment, and society, for the creation of long-term business value, and for sustainable growth in the long run. All employees of the Company have the right to safe and healthy working conditions, recognition and fair evaluation of their contribution to the Company, assistance in enhancing their professional skills, and an open and constructive discussion

of the quality and effectiveness of their work. The Company has a zero tolerance policy for discrimination by nationality, race, religion, age, gender, political beliefs or other grounds.

We promote meritocracy, fairness, and integrity while providing every employee with a workplace conducive to new achievements and assessing their respective contributions to the Company's overall success based on merit. We also foster a culture of understanding and engagement, and support among our employees at all levels.

