

ENVIRONMENTAL RESPONSIBILITY AND SAFETY IN THE WORKPLACE

Ensuring industrial safety and environmental responsibility is the important task for us. The Company's goodwill, reputation and financial well-being depend on successful solution of this task. Today we focus on transparency of environmental reporting, and thanks to this, for the second year in a row, KMG holds the highest place in the Rating of openness of oil and gas companies of Kazakhstan in the field of environmental responsibility*.



Gas utilization growth

In 2018, the highest level of APG utilization in the history of the KMG Group of Companies was reached – 93 %. The gas flaring rate is 6 tons per 1,000 tons of produced hydrocarbons, which is almost 50% lower than the IOGP global average. We continue to implement the World Bank Initiative “Complete Cessation of Regular APG Flaring by 2030” and intend to stop the practice of regular APG flaring no later than 2030.



Environmental indicators disclosure

In 2018, we announced our participation in the Carbon Disclosure Project (CDP) initiative – an international community of investors for disclosure of information about direct and indirect greenhouse gas emissions and the risks associated with climate change, and began estimation of the carbon footprint of commercial products from the wellhead to end-use.

* Environmental responsibility rating for oil and gas companies <https://www.zs-rating.ru/>

OUR APPROACH

GRI 103-1, 103-2, 103-3, 302, 303, 304, 305, 306, 307, 403

The objectives for managing health, safety and environmental issues are directly related to the Group’s Development Strategy. In 2018, the KMG Strategy 2028 was expanded with the strategic initiative “Environmental Responsibility” which sets priorities for the Group in terms of environmental protection (managing greenhouse gas emissions and reducing gas flaring, water management, production waste management, land reclamation and increasing energy efficiency). In terms of occupational safety, our goal is to enter the top quartile of international oil and gas companies within the IOGP in terms of safety performance.

We carry out production activities in accordance with the requirements of national legislation and the Group’s Policy in the field of occupational safety, industrial safety and environmental protection, approved by the decision of the KMG Management Board on May 24, 2016. The Policy applies to all employees of the Group, as well as employees of contractors who provide services at our facilities. In 2019, it is planned to improve the Policy and develop the Environmental and Health and Safety Policy.

The HSE activity is coordinated in the corporate center by the Vice President for Safety and Environment. The corporate center analyzes achievements and identifies areas for improvement, goals and objectives for future activities in the field of HSE and energy efficiency, conducts benchmarking with past periods and with similar indicators of the leading international companies in the industry (IOGP, IPIECA).

Also, in 2017, a three-tier system of HSE Committees was introduced: at the level of KMG’s Board of Directors, Functional Committee for HSE, Safety and Environmental Protection at the level of KMG management, HSE Committees at the level of subsidiaries

and affiliates. The purpose of creating a system of committees is to manage the transformation process in terms of health, safety and environmental protection.

Key Indicators for Evaluating the Effectiveness of Activities in the Areas of Health, Safety and Environmental Protection

Health and safety KPIs

Fatalities

- Number of fatalities
- Fatality rate (FAR) per 100 million people-hours

Lost time

- Lost Time Injury Rate (LTIR)
- Motor vehicle accident rate (MVAR)

Recordable cases

- Total Recordable Injury Rate (TRIR)
- Major (LTIR)

Health

- Total sick days
- Non-work related fatalities

“Safety, environment and social performance are now closer to the core of our business plans and decisions”.

Alik Aidarbayev, CEO

Environment KPI's

Spills and discharges

- Volume of sabotage spills
- Volume of operational spills
- Number of sabotage spills
- Number of operational spills
- Upstream flaring CO₂ equivalent
- Upstream hydrocarbon volume flared

Emissions

- GHG emissions
- GHG intensity / unit of hydrocarbon
- NO₂ & SO₂ emissions / unit hydrocarbon

Waste and Water

- Elimination of legacy pollution and remediation of hydrocarbon contaminated land
- Legacy waste & contaminate land
- Reducing of freshwater use

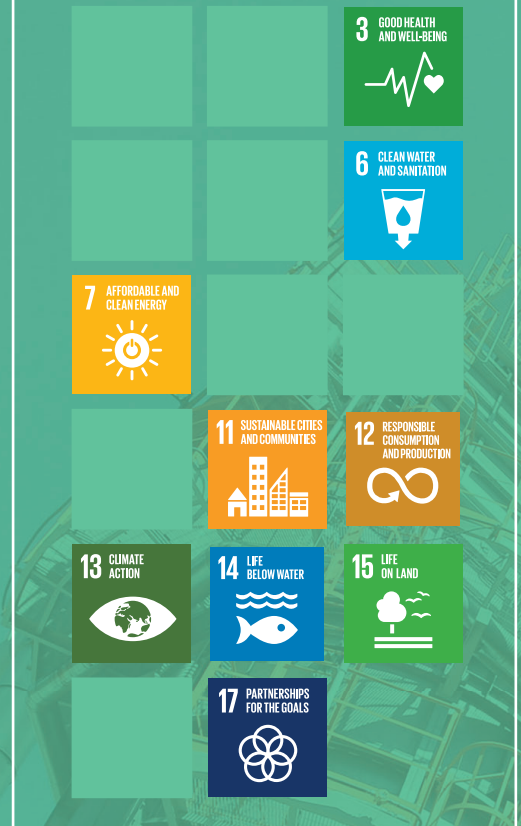
Energy use

- Energy intensity (by business division)
- Energy efficiency (%)

"A culture of safe work and respect for the environment is determined by behavior and personal beliefs. We are working on the continuous promotion and distribution of information, statistics on labor protection and environmental aspects through all communication channels in KMG. The message that safety is the main value of our company is cultivated in the minds of our managers and employees".

Vincent Spinelli, HSE Managing Director

SUSTAINABLE DEVELOPMENT GOALS



Principle 7

Environment: Businesses should maintain a cautious approach in dealing with environmental problems.



Principle 8

Environment: Businesses should take initiatives to promote greater environmental responsibility.

Principle 9

Environment: Businesses should encourage the development and diffusion of environmentally sound technologies.

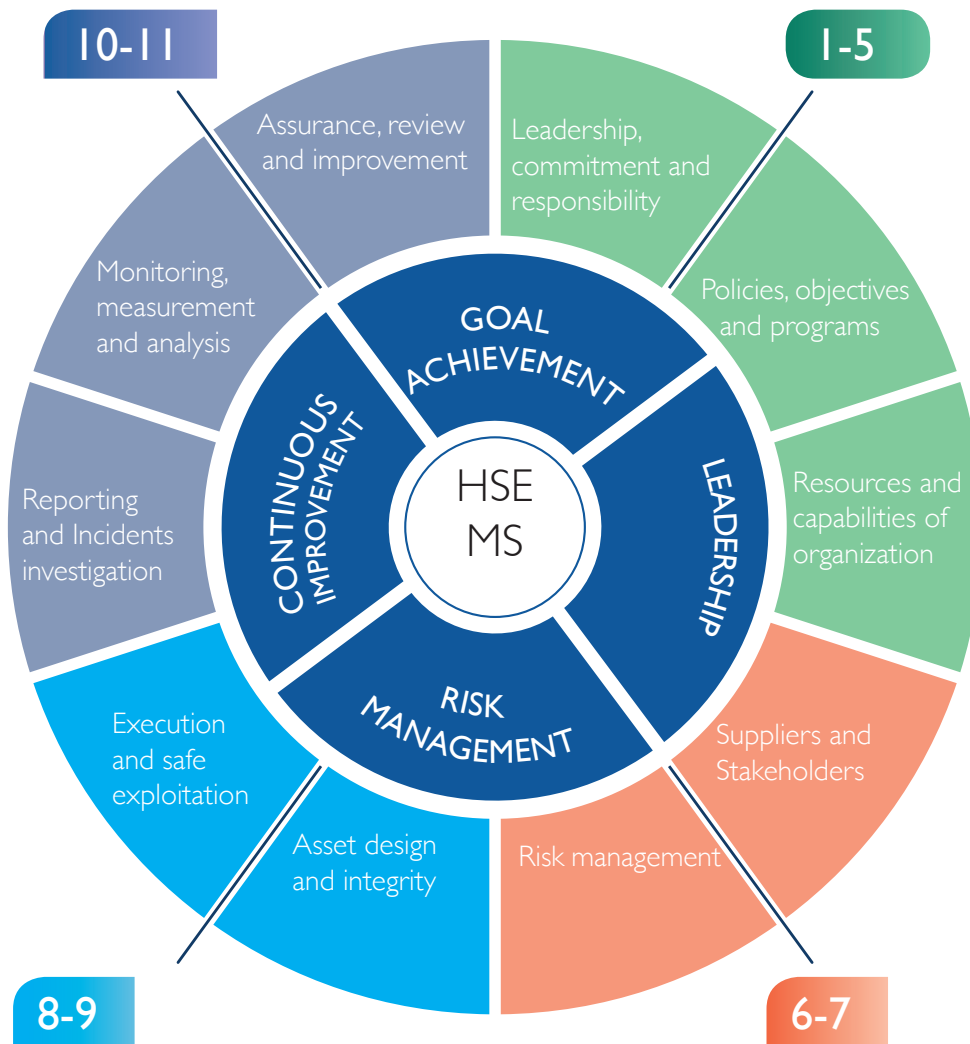
HSE Management System

In September 2018, the Guidelines for Health, Safety and Environment Management Systems were approved. This document has changed the approach to managing HSE issues in the Company. The guide was developed based on the best international practices – recommendations of the Association of Oil and Gas Producers (IOGP) and applies to the KMG Group of companies. This system is based on four fundamental principles: Leadership, goal

achievement, risk management and continuous improvement.

Also, in KMG, since 2006, the management system in the area of quality, environmental protection, health protection and occupational safety is maintained in accordance with the requirements of ISO 9001, ISO 14001 and OHSAS 18001. Subsidiaries and dependent organizations with a significant level of energy consumption are certified to ISO 50001.

HSE MS Structure & Industry Best Practices Implementation



1. LEADERSHIP

- Leadership commitment: Leadership Forums, SPE
- 3 tier HSE Committee System

2. GOALS

ZERO

- Incidents
- Spills
- Discharges
- Routine Flaring

3. STRATEGY

- Provide safety at work
- Environmental responsibility

4. POLICIES

- HSE policy
- Transport policy
- Alcohol policy
- Air emissions management policy

5. STANDARTS

- Development & implementation of HSE standards, based on worldwide best practices

6. STAKEHOLDERS

- Contractor Standard
- Contractors Reporting
- Public hearings

7. RISK MANAGEMENT

- Risk Management System
- BBS program
- Risk Assessment Standard
- EIA

8. ASSET INTEGRITY

- Fire safety preparedness
- LOTO
- Process Safety Management System

9. EXECUTION

- Health System Management
- Transport Safety Program
- Crisis Management Standard
- Methane leak detection program
- Waste Management standard
- Water Management standard
- Energy efficiency Roadmap

10. MONITORING

- HSE Reporting Rules
- HSE Database automatization
- HSE KPI system
- Incident Investigation Procedure
- Automated "Incident investigation" module
- Benchmarking

11. ASSURANCE AND IMPROVEMENT

- HSE Management System Assessment
- HSE Committee System
- HSE Compliance and RT Audits
- HSE awareness Campaign

The corporate center uses various means of communication, which allow to properly build a dialogue with stakeholders and the Company, as well as in the prescribed manner to bring information to the Board of Directors of KMG. Thus, the discussion of problematic issues with the shareholder is carried out in the framework of the meetings of the BoD and its Committees through representatives of the shareholder who are members of the BoD and its corresponding committees.

Health, safety and environmental issues are monthly heard at meetings of the KMG's Board of Directors, which increases the responsibility of managers and specialists.

Since 2017, a three-tier system of Health, Safety and Environment Committees started its activities: at the level of the KMG BoD, the Functional Committee on Health, Safety and Environmental Protection at the management level of KMG, the HSE Committees at the level of subsidiaries and affiliates. The purpose of creating a system of committees is to manage the process of improvement in occupational health, safety and environmental protection. The senior management of KMG, production managers and managers for HSE of the SDEs have become members of the Functional Committee on Health, Safety and Environmental Protection.

WORKPLACE SAFETY

GRI 103-1, 103-2, 103-3, 403-2

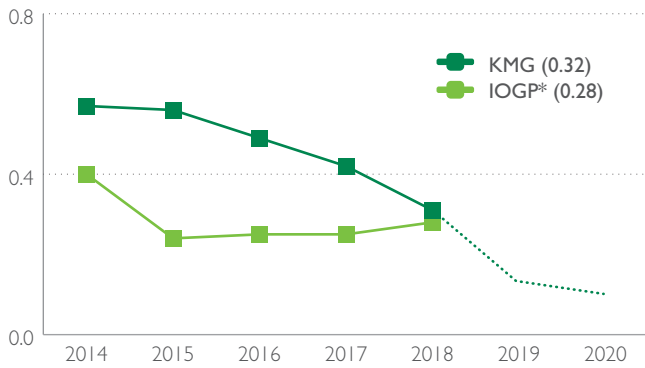
Over the past 4 years, great work has been done in KMG in occupational safety, industrial safety and environment (hereinafter referred to as HSE), while 2018 was the best in terms of safety and health indicators. We have achieved our goal – to enter the top 20 global industry companies in terms of safety by 2020 in terms of the fatal accident rate, and by 2020 the Company expects to enter the top-most injury rate.

The number of injured in accidents, including fatal accidents, decreased to a historic low – 35% (50 injured in 2018) compared with 2017 (77 injured, respectively). As part of the membership in the International Association of Oil and Gas Producers (IOGP), we submit annual OSH reports and conduct benchmarking with global oil and gas companies.

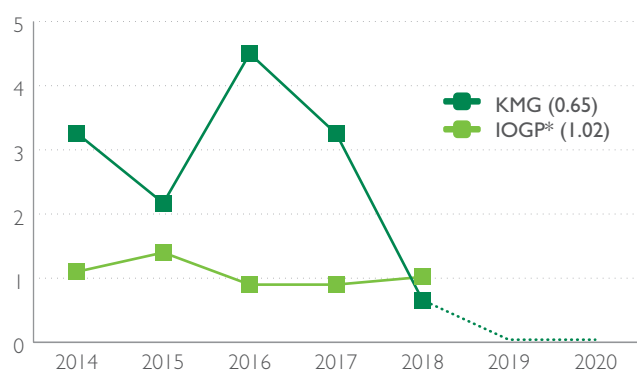
The total number of injured male workers amounted to 44 people, female – 6 people. Based on results of the analysis of types of incidents, it was revealed that 80% of injuries are caused by falling/sliding/tripping, falling from a height and effect of moving equipment/items or energized equipment. In order to reduce injuries, it is planned to conduct offsite meetings on HSE issues in 2019 in order to clarify the essentiality of observing industrial safety measures.

There is a significant decline in road traffic accidents (25%) and driving injuries (47%). Over the past three years, a large-scale campaign has been carried out to equip vehicles with safety belts, and passenger vehicles with GPS systems, which have already brought significant results: in 2016 there were 71 accidents, in 2017 – 89, in 2018 – 67.

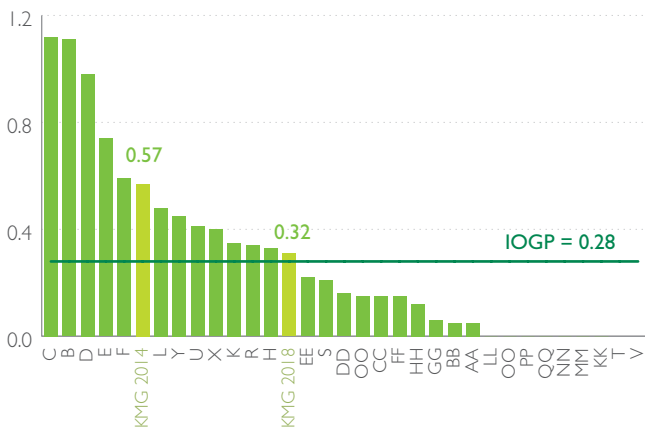
Lost Time Incident Rate (LTIR per 1 million people-hours)



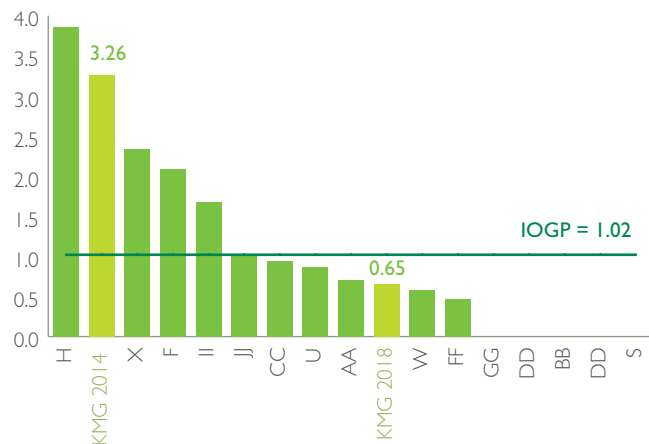
Fatality Accident Rate (FAR per 100 million people-hours)



Comparative analysis of KMG LTIR with industry average



Comparative analysis of KMG FAR with industry average



* IOGP – International Association of Oil & Gas Producers (<https://www.iogp.org/>)

Over the past 2 years, the focus has been on more thorough GPS monitoring and actions taken on violations, as well as a campaign to increase seat-belt use using a seat-belt simulator (Convincer), not only among drivers, but also workers, using vehicles in everyday life and their family members. So, by the end of 2018, there were 4 “Convincer” simulators simulating the work of seat belts in case of the accident throughout Kazakhstan, and more than 8,000 demonstrations were held. This helped to raise awareness of the importance of using seat belts and reduce the number of people injured in road traffic accidents (by 47%).

Key events to improve safety culture and reduce injuries at work, implemented in 2018:

- Conducted defensive driving training aimed at developing driving skills, changing drivers’ attitude to safety. There were 12 people trained.
- The conduct of safety behavioral observations (hereinafter – SBO) of works (SBOW) continues – 68,263 observations were made.
- Implemented Driving Safety Behavior Monitoring Program – 23,495 observations conducted.

The visual success of the program is the fact that due to the training and experience, as well as the correct behavior of the management, the unsafe behavior is immediately corrected, the safe behavior is highly appreciated. This program has improved communication and the relationship between the managers and the employees by demonstrating caring and personal responsibility for safety. A detailed study of each category of SBO allowed the management to accurately identify problem issues in business areas, as well as subsidiaries and affiliates for the development and implementation of corrective action plans.

As part of the process of automating the HSE database, 4 modules have been completed: “PNB”, “Culture Assessment”, “Incident Investigation” and “Audits”.

- Continuous work is carried out on the development and implementation of corporate documents based on international best practice, ensuring a consistent and widespread approach to occupational safety and health issues across the entire KMG Group of companies.

The poster features the KMG logo at the top left, with the text "КазМұнайГаз" and "NATIONAL COMPANY" / "ҰЛТТЫҚ КОМПАНИЯСЫ". The main title is "KMG GOLDEN RULES MESSAGE FROM THE CEO". Below the title, there are two paragraphs of text. The first paragraph states: "The Golden Rules set out clear, simple and consistent communication regarding our highest safety risks. These rules apply to all employees and contractors working for KMG companies. The best-performing companies operate within a simple framework of rules and trust their employees to do the right thing. Our Golden Rules will help us do the same – save lives!" The second paragraph states: "I expect our workers, leaders, managers, supervisors and contractors to make a personal commitment to understand and follow the Golden Rules. Safety will always be a core value and shall be based on respecting each other and our rules." Below the text, there is a quote: "My message is simple, «If you choose to break the rules, you choose not to work for the KMG»". To the right of the quote, it says "Chairman of the Board JSC NC 'KazMunayGas' Alik Aidarbayev". At the bottom, there are eight circular icons representing different safety rules: "Fit for work", "Driving safety", "Permit to work", "Energy isolation", "Confined space entry", "Working at height", "Moving and energized objects", and "Lifting operations".

- A 3-tier system of HSE Committees has been implemented and is working.
 - Comprehensive audits were carried out at subsidiaries and affiliates with a high level of injury, based on the results of which, corrective action plans were developed and implemented to reduce the risks of industrial accidents.
 - Field presentations were conducted to educate employees on new safety programs, and top management on the importance of their involvement in security processes.
 - The IV Annual General Directors' Forum in the field of occupational safety and health was held on the theme "100% occupational safety as a personal matter of everyone". Similar forums are held in SDCs for line managers.
 - The IV annual competition of the Chairman of the KMG Board "The best innovative ideas and practices in the field of health, labor and environment protection of the KMG Group of companies was held.
- Developed and implemented awareness programs for field workers, including the following main activities:
 - preparation and distribution of quarterly messages from the Chairman of the Management Board to employees with the aim of increasing safety culture;
 - brochures on the topic "Prevention of heart attacks and strokes" were developed and published and distributed to the KMG Group of companies.
 - image products with HSE logo sent to subsidiaries and affiliates.
 - animated screensaver "100% security" installed on computers of employees of subsidiaries and affiliates, etc.
 - KMG holds meetings with the portfolio companies of Samruk-Kazyna JSC to share experience in the field of HSE.

HEALTH CARE AND WORKPLACE HYGIENE

GRI 103-1, 103-2, 103-3, 403-3, 403-4

Management of issues in the area of health protection and work hygiene in KMG and SDEs is carried out in accordance with the requirements of Kazakhstani legislation: the Labor Code, the Health Code, the Sanitary Regulations and Instructions of the Republic of Kazakhstan, International Health protection and Work Hygiene Requirements. In addition, the Company enters into collective agreements with employees, in which special attention is paid to the protection of health and safety at the workplace. All employees of the Company are covered by an annual medical examination, in addition, employees of subsidiaries and affiliates undergo a daily pre-shift and post-shift medical examination.

Number of days of incapacity for work due to diseases of employees of SDEs was 216,203 days in 2018, which is on 8,362 days less than in 2017, or 3.7%. Number of mortality cases, not related to injuries among SDE employees decreased by 5 cases compared to 2017, or by 19.2%.

The range of harmful production factors inherent in the oil and gas industry has the risk of occupational

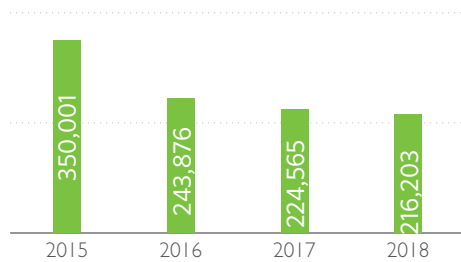
diseases. Issues on their monitoring and determination are regulated in accordance with the legislative requirements of the RoK.

KMG Group of companies takes a set of measures to prevent and monitor cases of detection of occupational diseases at production facilities on a regular basis. The final decision on identification of occupational disease is made according to the results of a number of examinations carried out by the relevant organization: Institute of Public Health and Professional Health of "MUK" NC JSC.

According to the results of medical examinations there were no cases of occupational diseases (acute or chronic) in the KMG Group of companies during the reporting period.

Within the framework of the implementation of the Roadmap on improvement of labor and the environment protection in the KazMunayGas Group – 2020, approved by the decision of the Board on 27.09.2016, corporate health programs are introduced by the KMG, first of all, related to reduction

Number of days of incapacity for work due to diseases



of workers diseases and mortality, not related to injuries.

In 2018, a corporate campaign to improve healthcare of KMG “Prevention of heart attacks and strokes” was developed and implemented, aimed at preventing and reducing mortality among workers associated with cardiovascular diseases. The implementation of the “10 steps to recovery” initiative and the internal regulatory document “Regulations on the organization of emergency medical care in the KMG Group”. The main tasks of these regulations are to establish requirements to provide workers with emergency medical care, to equip first-aid posts and to maintain an emergency medical response plan.

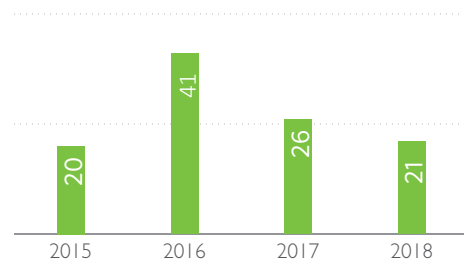
Following activities were performed for improvement and effective management in the area of health protection and labor hygiene:

1. Comprehensive inspections of subsidiaries and affiliates were carried out with the involvement of specialists on occupational health and hygiene

Plans for 2019:

We do not plan to stop on the achieved success, because we realize that the improvement of the HSE management system is an ongoing process. Now that KMG is on the right track in terms of improving labor protection, health and transport safety, we are ready for a new challenge – management of contracting organizations. In 2019, we plan to establish an indicator for contracting organizations’ safety management and transparency of contracting organizations’ reporting as a KPI. Contractors comprise more than 50% of our operating personnel, and increasing their safety will ultimately affect overall performance of KMG. Our expectations are aimed at ensuring that all employees of the KazMunayGas Group of companies and all contracting organizations always go home safe and sound. We will continue to work towards our goal of ensuring 100% industrial safety.

Number of mortality cases not related to injuries



from other companies of the Group in order to share experience;

2. A training (seminar) has been organized and conducted on occupational health and hygiene of the subsidiaries and affiliates on the subject of “Professional pathology and certification of workplaces on working conditions” (based in the National Center for Occupational Health and Occupational Diseases in Karagandy);
3. 10 audits were conducted at SDEs for compliance with occupational health and safety requirements;
4. production sites and workshops, rest rooms for employees, domestic premises, canteens and medical aid stations were examined, and according to the results, the inspection identified deviations from the norms and 70 recommendations were issued;
5. Based on the conducted regular medical examinations (RME) of employees at the SDEs, action plans for 2018 were developed for the recovery of identified patients on the basis of the final reports of the RME.

In addition, the priorities for 2019 are:

1. The key labor protection program planned for 2019 is the launch of the pilot project “Accident-free Reporting”. In 2017 and 2018, the focus was on identifying and correcting unsafe behavior. The Accident Free Reporting program will focus on unsafe working conditions. This program will involve ordinary workers and give them the opportunity to express their concerns.
2. Restarting the Golden Rules program, which has proven its success.
3. The NPS program is no longer a KPI, but a strategic initiative and will be monitored through the HSE Committees.
4. Despite the fact that the number of injuries decreased to the lowest level in the entire history of KMG, by 35% compared with 2017, 21 of 48

cases of injuries fell on hands and / or fingers, which is 43 % of the total number of injuries. In this regard, in order to solve this problem, in 2019 we are launching a program to prevent injuries to these areas called “Preventing injuries to hands and fingers”.

5. In October 2019, KMG will hold the 1st Caspian Symposium on HSE in Kazakhstan, which will attract more attention to safety issues than ever before, and about 400 participants from around the world will take part in it.
6. Introduction of the Crisis Management Center and conducting training sessions.
7. Development of a corporate standard for risk management and process safety management.

8. Development and implementation of the main corporate document on the management system in the field of health and labor hygiene of KMG, including tools for assessing the current level of the management system, including risk assessment and preparedness for an emergency medical response;
9. Organization of a demonstrative training alarm for emergency medical care in the KMG Group of companies on the basis of Atyrau Refinery, KTO, ICA, EMG and KGM.
10. The work of functional groups in various areas.
11. Continued implementation of the HSE strategy and plans through the system of HSE committees.

INDUSTRIAL SAFETY

In order to prevent accidents and incidents at all hazardous production facilities and to reduce the accident rate in 2018, the Company carried out the following activities:

- Systematic control of timely conduction of the survey, repair and replacement of technical devices;
- Strict adherence to technological discipline;
- Implementation of industrial control in the area of industrial safety;
- Full compliance with the industrial safety requirements established by laws and regulations.

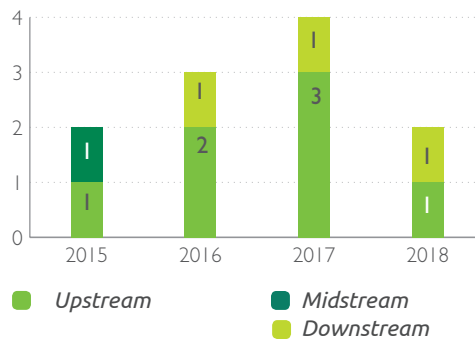
In 2018, two accident occurred at the Company’s production facilities – a gas, oil and water inflow in the oil and gas field, and depressurization of the process pipeline followed by ignition at the oil refinery. The main causes of accidents were a violation of industrial safety rules and unsatisfactory technical condition of the equipment due to its physical deterioration. The amount of losses amounted to 4.860 million tenge, no injuries.

In the occurred accidents, state technical investigation was carried out establishing causes and circumstances, and root causes were identified, corrective measures were developed at the Company’s corporate level with subsequent dissemination of “Lessons learned from Incidents” to all subsidiaries and affiliates.

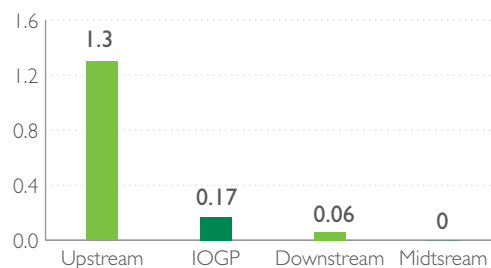


In the reporting year, benchmarking was conducted in the context of the Company’s business areas in terms of the Tier 1 Process Safety Event Rate (Tier 1 PSER) industrial safety incident rate with international oil companies that are members of the IOGP

Accident rate (technological hazards) at the production facilities



Tier 1 PSER industrial safety incident rate



association. This indicator for the IOGP group of companies is 0.17, which is significantly lower than the Company's E&P subsidiaries and affiliates, which was 1.3, and higher than the Company's similar indicators for Processing and Marketing subsidiaries and affiliates (0.06) and

Transportation subsidiaries and affiliates (0). In the Upstream business area, the majority of industrial safety incidents were caused by wear on pipelines and equipment breakdowns caused by corrosion.

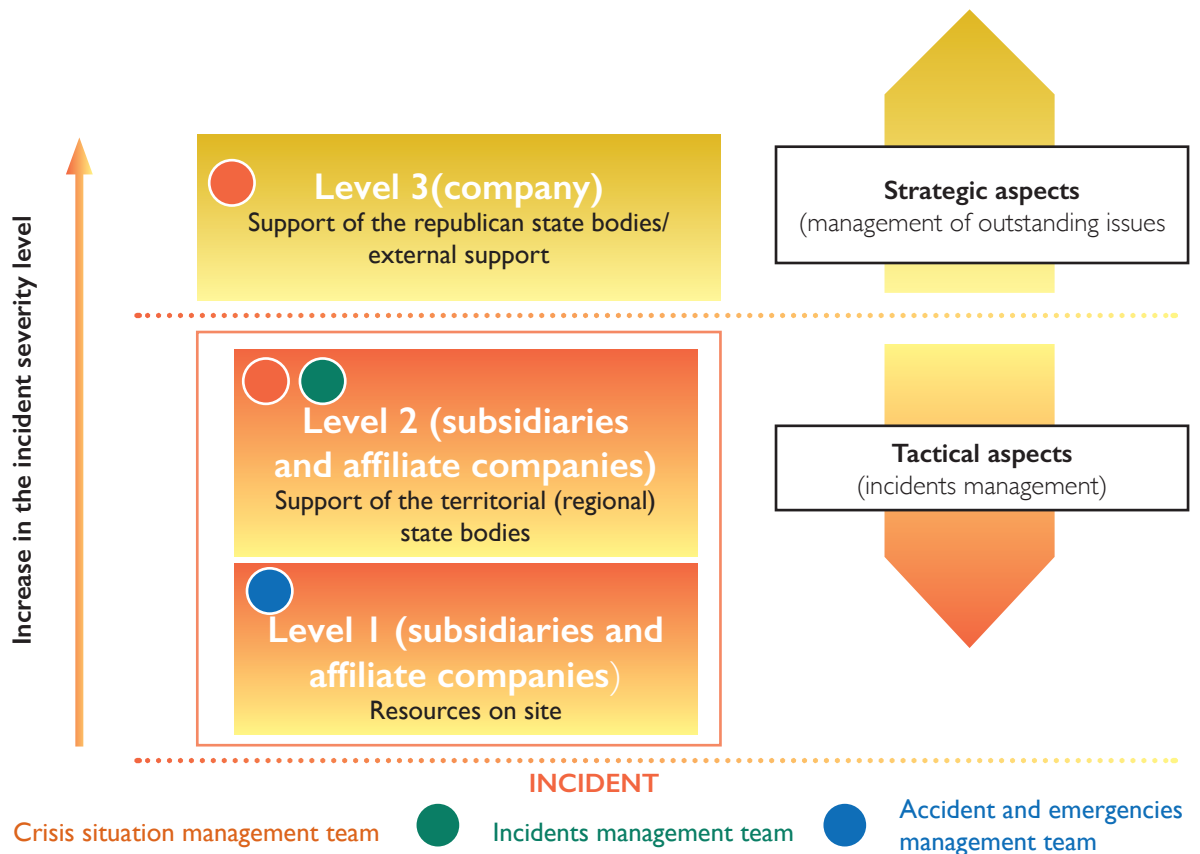
Emergency preparedness (crisis) situations

In the reporting year, the corporate center of the Company developed a draft Regulation on crisis management to ensure prompt response, prevent the escalation of possible crisis situations, reduce the severity of consequences and possible damage as a result of their occurrence.

The regulation assumes a three-level approach to managing incidents that can have a significant impact on the reputation of the Company and its subsidiaries and affiliates, its financial

well-being or long-term viability. Crisis situations are considered both of an industrial nature (accidents, fires, explosions, etc.) and not related to production (large-scale fraud, social unrest, acts of terrorism, etc.).

In all cases, the involvement of the Company's senior management for making strategic decisions aimed at reducing the impact and minimizing the effects of crisis situations is envisaged.



Fire Safety

In 2018, the companies of the Group introduced fire safety rating sheets, which are aimed at checking the readiness of non-state fire services to prevent and extinguish fires.

Inspection and evaluation of preparedness for prevention and extinction of fires is carried out in order to determine the readiness of non-state fire services (NSFS), as well as the effectiveness of the fulfillment of contractual obligations in the field of prevention and extinction of fires at the Company’s facilities. Inspections are carried out on in the following areas:

- 1) availability of NSFS’s permits for implementation of activities in the field of fire safety regarding prevention and extinction of fires;
- 2) NSFS unit’s staffing with man-power, fire-technical equipment, RPD;
- 3) presence of a fire station building or specially designed boxes;
- 4) organization of man-power training;
- 5) organization of guard service;

- 6) organization of gas-smoke protection services;
- 7) organization of operation and maintenance of fire trucks;
- 8) organization of operation and testing of fire-technical equipment;
- 9) organization of fire prevention activities;
- 10) readiness for actions to localize and suppress the fire (based on the results of the test fire-tactical training).

Scheduled inspections for evaluating the readiness of NSFS are carried out by employees of the HSE service, specialists in the field of fire safety of subsidiaries and associates of the company in accordance with plans approved by the heads.

According to the comprehensive analysis of the evaluation data, a number of subsidiaries and affiliates where it is necessary to take urgent corrective actions, such as: ensuring staffing of NSFS staff, building a fire station, the presence and staffing of fire engines in accordance with the regulations, etc., were identified.

Land Oil Spill Prevention

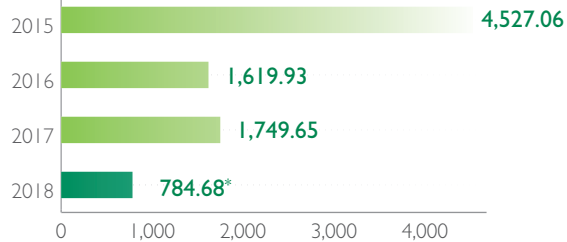
In 2018, the Company, as before, paid great attention to ensuring the integrity of pipelines as one of the important areas in the field of industrial and environmental safety.

The volume of oil spills in 2018 decreased by 55% compared with the level of the previous year and amounted to 784.68* tons. Last year’s figure was 1,749.65 tons. These results are a consequence of implementation of programs to improve reliability of field pipelines in the Company’s E&P subsidiaries and affiliates aimed at replacing worn-out pipelines and protecting pipelines from corrosion by inhibiting.

The main cause of oil spills in the Company is impulses of field pipelines under the influence of corrosion processes. Therefore, in 2018

GRI 306-3

Oil Spill Volume, tons



the Company continued to reduce the number of failures and gusts of field pipelines through the timely and high-quality implementation of measures for diagnosis, reconstruction, replacement, inhibition and cleaning of pipelines aimed at improving their integrity and reliability.

In close cooperation with law enforcement agencies, starting in 2012, “KazTransOil” JSC

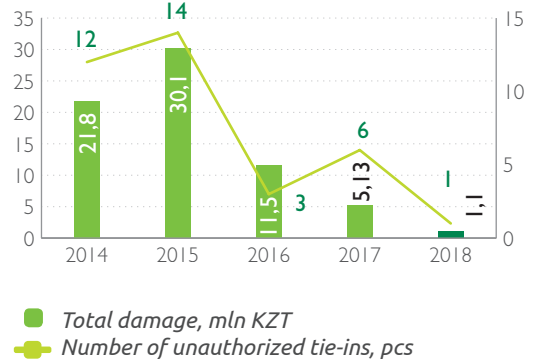
* Indicator reflects data on oil spills in the “Upstream” business area.

turned the tide of criminal illegal tie-ins into the company’s pipelines. Already in 2013, it was possible to reduce the number of unauthorized tie-ins from a few dozen or even hundreds per year to 17 facts; at the end of 2014, 12 unauthorized tie-ins were revealed; in 2015, 14 frames were completed; in 2016 – 3 unauthorized connections, in 2017, 6 illegal tie-ins were revealed, in 2018 – 1 tie-in.

These indicators are achieved largely due to the implementation of the following activities:

- strengthening control over the monitoring of the work of mobile groups on GPS systems and the timely implementation of mobile groups of detours and inspections of pipelines;

Unauthorized Tie-Ins



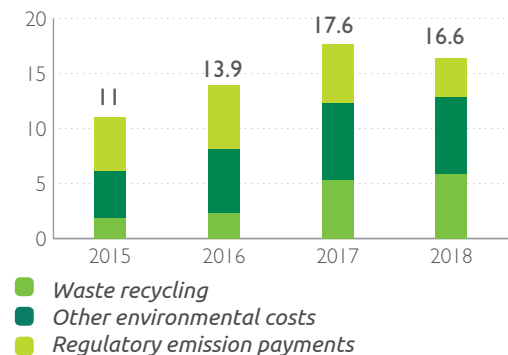
- protection of pipelines through the monitoring system “Optosense”.

ENVIRONMENTAL INDEX

In accordance with the precautionary principle (Principle 15 of the Rio Declaration on the Protection of the Environment and Development of the United Nations), as well as the requirements of the KMG environmental management system and the provisions of the legislation of the Republic of Kazakhstan at the planning stage of each project, an environmental impact assessment (EIA) is carried out to determine the environmental and other effects of management and business decisions, develop recommendations for improving the environment, preventing destruction, degradation, damage and depletion of natural ecological systems and natural resources. In addition, at the design stage of each project, public hearings are held with the participation of representatives of interested parties: administrative, state and regulatory bodies, research organizations, public associations, the local population, the media. We provide access of all interested parties to the draft EIA, reception and registration of comments and suggestions. All KMG Group EIA projects are subject to state environmental impact assessment and are available to the public concerned on the official

GRI 102-11, 103-1, 103-2, 103-3, 302, 303, 304, 305, 306, 307

Dynamics of environmental payments and costs, bln KZT



website of the Company, on the websites of local authorities throughout the project life cycle. In the period 2017–2018, 95 meetings were held with the local community and public organizations, including 45 meetings in 2017 and 50 meetings in 2018. According to the results of public hearings, appropriate measures are taken, taking into account the recommendations and opinions of stakeholders.

In order to effectively manage environmental risks, the Company is constantly improving

approaches to environmental management and allocates the necessary resources to protect the environment, in particular for environmental costs, which include the payment of taxes for regulatory emissions, the cost of environmental protection measures, insurance, compensation measures in the field of environmental protection, investments in environmental impact prevention, etc.

The Company has increased the budget for processing historical waste and restoring polluted land. Since 2015, investments in waste recycling have increased 3 times and account for more than a third of all environmental protection costs. At the same time, there is a decrease in emission payments associated with a reduction in atmospheric emissions by increasing the use of associated petroleum gas.

Use of Energy Resources and Energy Performance

GRI 103-1, 103-2, 103-3

As one of the tasks in the field of environmental protection and increasing the efficiency of production, KMG sees continuing activities in the field of energy efficiency. The Corporate Center collects and analyzes data on energy consumption and energy efficiency indicators, monitors progress and identifies opportunities for improvement, conducts benchmarking with the past period and with indicators of similar companies in the industry (IOGP).

The company's activities in the field of energy conservation and energy efficiency are based on the methodology of the international standard ISO 50001 "Energy Management Systems", which is the best generally recognized international practice for system management in this activity.

Since 2017, KMG has a Roadmap on energy saving and energy efficiency of subsidiaries and affiliates, including jointly controlled organizations and joint ventures of KMG for 2017–2020. The objectives of the Roadmap for energy saving are:

- increasing the responsibility of top management through the introduction of KPI on energy efficiency for managers responsible for energy saving and energy efficiency;
- ensuring the rational use of energy resources;
- reduction of the payment burden by increasing the energy efficiency of energy-saving measures;
- ensuring energy efficiency in the procurement of construction, reconstruction, overhaul of power equipment;
- attracting private investment to improve energy efficiency, including under the terms of energy service agreements (contracts);
- improving the system for monitoring compliance with the requirements and indicators of energy efficiency;
- compliance with the requirements of legislation in the field of energy saving and energy efficiency.

Energy Consumption

GRI 302-1

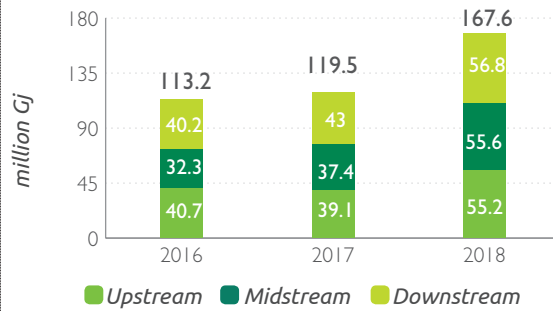
In total, 167.6 million Gj* of fuel and energy resources were consumed during the reporting year, which is 40% higher than the 2017 level, including 12.6 million Gj of electrical energy consumption, 6.0 million Gj of thermal energy,

and motor fuel – 2.0 million Gj, boiler-furnace fuel 146.9 million Gj. Energy consumption is distributed between the three business areas "Upstream", "Midstream" and "Downstream".

The increase in energy consumption compared to 2017 is primarily due to the modernization

* In the Annual report for 2018, operational data on energy consumption were indicated.

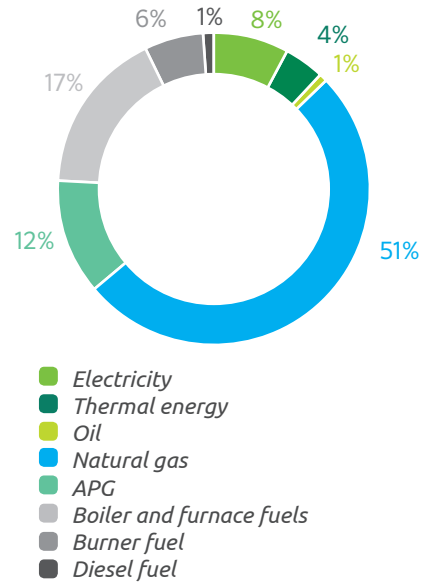
Energy contribution by area of activity



of refineries and the introduction of new technological units and to increase the depth of oil refining, as well as the increase in production watering at mature fields.

In 2018, the volume of own generated energy in the KMG Group of companies amounted to 683.4 million kW (2.5 million GJ) of electrical energy and 3,812.5 thousand Gcal (16.0 GJ) of thermal energy.

Energy consumption (by type), %



Energy consumption outside the organization

GRI 302-2

Currently, we keep records of the consumption of energy resources only within the organization; in this connection, energy

consumption outside the organization is not reflected in this report.

Reducing Energy Consumption*

GRI 302-4

Saving the consumption of fuel and energy resources is one of the KPIs of the roadmap for energy saving and energy efficiency in the KMG Group of companies. The roadmap is designed to ensure the rational use of energy resources, reduce the payment burden as a result of increased energy efficiency, increase the involvement of management in energy efficiency issues, and also to comply with legislative requirements for energy conservation and energy efficiency. It is worth noting that the implementation of the relevant measures applies to our subsidiaries and affiliates that are subjects of the State Energy Register in Kazakhstan. 14 KMG subsidiaries and affiliates

are included in this register, including assets in the upstream, midstream & downstream areas.

In 2018, 59 energy saving and energy efficiency measures were carried out, main main of which are technological equipment upgrade, implementation of devices for reactive power compensation, introduction of energy-saving technologies, thermal energy production and consumption optimization. Saving of fuel and energy resources amounted to 436.8 thousand GJ, in-kind 16.8 MMkW (60.6 thousand GJ) of electricity, 8.8 thousand Gcal (37.1 thousand GJ) of thermal energy, 9.6 million m³ (324.3

* In the Annual report for 2018, operational data on reducing energy consumption were indicated.

thousand Gj) of natural gas and 458 thousand liters (14.8 thousand Gj) of fuel and lubricants.

Due to the fact that the main measures for energy saving and energy efficiency, namely the introduction of technological equipment was realized in the end of 2018, the economic effect in kind of energy resources will be visible only in 2019. The financial expenses for the implementation of these measures amounted to KZT 1.8 billion. Saving financial expenses for the purchase of fuel and energy resources amounted to KZT 395,2 million. The planned payback period is 4.6 years.

This year, an energy audit of “Kazgermunai” LLP was held. According to the results of the energy audit, measures were taken to install the VFD, to modernize the heating system of the laboratory building of the Nurali metro station and to replace fluorescent lamps with LED lamps. The total cost of implementing the agreed activities is KZT 30.15 million, the total savings will be KZT 6.5 million annually. The potential energy savings relative to the base year will

Energy Intensity

In 2018, the specific energy consumption in the direction of hydrocarbon production averaged over the Group of companies was 2.38 Gj per ton of produced hydrocarbons, which remains 59% higher compared to the international association of oil and gas producers IOGP, which in 2017 was 1,5 Gj per ton of produced hydrocarbons. In oil production, the specific consumption of energy resources is primarily due to the increase in water cut in production at mature fields.

In 2018 the specific energy consumption in the direction of oil refining averaged at the refinery was 3,5 Gj per ton. This is 15% higher than the level of European plants and is primarily associated with the harsher climatic conditions in the region of the petrochemical enterprise. In the reporting year, the increase in specific energy consumption is associated with the modernization

be 104.11 tons of fuel equivalent or 0.21% of the total consumption of fuel and energy resources for the base year*.

At the refineries, work is underway to conduct a study of the current level of refinery development in comparison with the world’s best refineries according to the methodology of HSB Solomon Associates LLC (hereinafter referred to as Solomon). The goal of Solomon’s research is to: determine the main indicators – “Solomon indices” – the oil refinery in a comparable basis, i.e. how efficiently the available capacity is used. Performance indicators are designed to compare refineries of similar size and configuration, and it is better to use them for operational comparisons, allowing you to compare the results of refineries (both production and economic) with the result of other refineries in different groups.

* The base year for “Kazgermunai” LLP is 2017. It is worth noting that for each KMG subsidiary and affiliate, which is a subject of the state energy register, its own base period is determined in accordance with the periods of the energy audit. In accordance with the Law of the Republic of Kazakhstan “On Energy Saving and Improving Energy Efficiency”, an energy audit is carried out at least once every five years.



of the plant, the construction of new ones and the reconstruction of existing process units to increase the depth of oil refining.

In 2019, the implementation of measures for energy saving and energy efficiency will continue, the results of which will save at least 0.8 million Gj of energy. As part of the modernization in 2019–2021, the refinery plans to introduce an automated system for technical accounting of electricity, which is implemented on the basis of microprocessor-based computing facilities and control complexes, which is a computerized system with centralized control and a distributed measurement function. The implementation of this project will lead to a reduction in energy costs due to the organization of reliable technical accounting, rational distribution and consumption of electricity.

Water Management

GRI 103-1, 103-2, 103-3

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

Activity of the KMG Group in terms of water resources utilization is consolidated in corporate center, where integral action of the company on water resources of the company is analyzed. KMG corporate center also analyzes achievements, problems, risks and determines areas for improvement, purposes and tasks for future activity, performs comparative analysis of dynamics and spatial distribution of water consumption.

The key event in terms of water resources protection in 2018 was the adoption by the Company of a corporate standard for water resources management, which will be gradually introduced in the Group of companies during 2019.

Water Footprint

The total water withdrawal of the KMG Group in 2018 was 93.7 million m³, which is 11% more than in 2017 (in 2017 – 84.4 million m³). The increase in water withdrawal occurred in the Downstream (by 4 million m³) due to the completed refinery modernization and the resulting increase in the volume and depth of oil refining; in the Midstream business area, an increase in water withdrawal of 2.6 million m³ is associated with an increase in the number of sub-subscribers who buy water for various needs from KTO; the volume of water withdrawal in the Upstream increased (by 2.8 million m³) due to an increase in the withdrawal of sea water to maintain reservoir pressure, and also due to an increase in the withdrawal of industrial water for production needs.

The standard postulates the main principles of KMG regarding the use of water resources – 8 “Water” principles, systematizes the approach to water management in KMG subsidiaries and affiliates, and also helps to increase the commitment of managers and employees to the issue of freshwater conservation.

Also in 2018, the modernization of the treatment facilities of “PKOP” LLP (Shymkent Refinery) was completed: the capacity of the plant’s treatment facilities was increased, and the quality of wastewater treatment was improved. Additional wastewater treatment at the reverse osmosis unit saves fresh water of up to 1.5 million m³ per year. In addition, a system for returning treated wastewater to the fire protection system has been introduced at the treatment facilities of PKOP. These measures will help to save up to 30% of fresh water previously collected from urban water supply systems.

GRI 303-1, 303-2, 303-3, 306-1, OGS

In 2018, KMG Group of companies discharged 10.9 million m³ of wastewater (9 million m³ in 2017). The main receiver (and end point) of KMG enterprises is various specialized receivers: storage ponds, evaporation fields and filtration fields. These facilities are technical facilities designed for natural wastewater treatment and prevention of environmental pollution. Enterprises that do not have their own drives transfer wastewater for cleaning and disposal to specialized companies. Quality standards for discharged water, established by environmental legislation, are achieved through the use of mechanical and biological methods of wastewater treatment.

A significant amount of treated wastewater is used for the second time at refineries, where in 2018 4.1 million m³ of treated wastewater

KMG BLUE PRINCIPLES

Water is the basis of life, the source of all things existing.

The stability and security of the state is determined by the abundance of clean fresh water, and the success and sustainability of business - by responsible, caring attitude to it. These principles express the Company's commitment and demonstrate its intention to conserve water resources for people, nature and well-being of current and future generations of our country.

We constantly use water - from daily needs to the extraction and processing of oil. And at the same time, within the daily routine, we must not forget how much water is priceless. Every employee of the Company can and should contribute to its preservation.

KazMunayGas NC JSC CEO



UNCONDITIONALLY ACCEPT AND UNDERSTAND THE VALUE OF WATER RESOURCES



COMPLY WITH LEGAL REQUIREMENTS AND INTERNATIONAL BEST PRACTICES



CONSIDER FRESHWATER CONSERVATION ISSUES WHEN MAKING MANAGEMENT DECISIONS



TRACK THE INITIAL SOURCES OF WATER INTAKE



STRIVE NOT TO USE DRINKING WATER FOR INDUSTRIAL PURPOSES



100% INSTRUMENT METERING OF WATER INTAKE AND DISCHARGE



IMPLEMENT WATER CIRCULATION AND WATER SAVING TECHNOLOGIES



CONTINUOUSLY IMPROVE WATER MANAGEMENT

Заявление о приверженности рациональному управлению водными ресурсами

8 ВОДНЫХ ПРИНЦИПОВ



Мы осознаем высочайшую ценность воды для жизни и здоровья человека, для общества и нашей производственной деятельности, и безоговорочно принимаем важность бережного и рационального отношения к водным ресурсам страны.



Мы стремимся не только выполнять требования законодательства Республики Казахстан, но и соответствовать международным стандартам и лучшим практикам, а также учитывать мнение всех заинтересованных сторон в регионе присутствия.



Мы учитываем вопросы сохранения пресной воды и эффективности ее использования при принятии управленческих решений и при управлении операциями.



Мы понимаем и оцениваем первоначальные источники своего водозабора, независимо от того, забирается вода напрямую или покупается через посредников.



Мы не используем воду питьевого качества для производственных целей.



Мы стремимся к стопроцентному приборному учету водозабора и водоотведения.



Мы стремимся к максимальному сокращению забора свежей воды за счет внедрения водооборотных и водосберегающих технологий и к снижению объемов сбросов, стремимся повышать качество очистки воды для максимально возможного повторного использования.



Мы наращиваем потенциал, участвуя в отраслевых ассоциациях и поддерживая международные инициативы в области водных ресурсов с целью изучения передового опыта для непрерывного совершенствования своей системы управления водными ресурсами.

Председатель Правления
АО НК «КазМунайГаз»

Айдарбаев А.С.



was reused, mainly this water is used to feed recycled water supply units. In total, 360 million m³ of water was used (circulated) in the KMG refinery's water recycling systems. The percentage of water reuse at KMG's plants is 26% (of the volume of water withdrawal in the direction of Recycling). Purified wastewater in the Mining and Transportation sectors is reused mainly for cleaning vehicles, dust suppression and fueling systems.

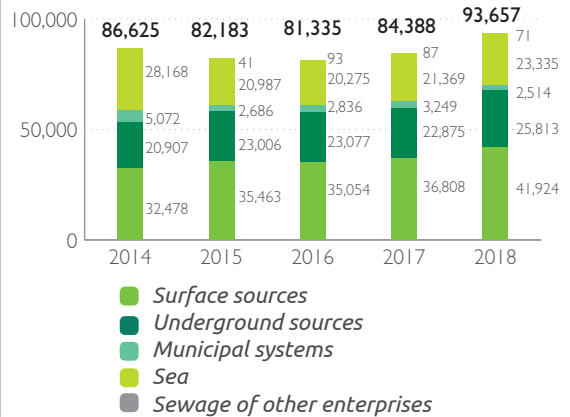
In the process of oil production large volumes of so-called, associated-formation waters – an oil-water emulsion is extracted to the surface, which is subsequently separated into water and oil by the gravity method. The water thus separated is sent for injection into the reservoir. A total of 124.4 million m³ of produced reservoir water in 2018, 99% was pumped back to maintain reservoir pressure, and only 1% into absorbing wells. Significant volumes of produced-surface water extracted to the surface, as well as a gradual increase in its volumes, indicate a depletion of oil fields (an increase in water-cut). In addition, in order to maintain reservoir pressure, 47.8 million m³ of water from other sources (23.3 – sea water, 7.2 – Volga and 17.3 – water from underground sources).

Total volume of produced water, thousand m³

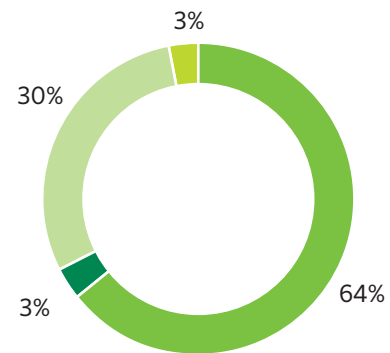
2015	2016	2017	2018
121,933	123,172	124,416	124,372

The most significant impact of the Company's activities is on the water bodies of the western region of Kazakhstan (the Ural and Kigach rivers, the Kokzhide sands, the Pyatimar reservoir), which are of particular ecological, economic, historical, cultural and recreational

Water withdrawal sources breakdown of KMG Group, thousands of m³



Use of water resources by type of operations in 2018, %



- Production needs
- Drinking needs
- Transmitted without use
- Technical losses

value. To prevent negative impacts on sensitive ecosystems, regular monitoring is conducted.

FUTURE PLANS

In 2019, the Atyrau Refinery will begin to design and build a new treatment plant for the plant. Modernization of treatment facilities will be carried out in 4 stages: the construction of the first line of mechanical wastewater treatment (MWT), the reconstruction of the biological wastewater treatment unit, the construction of the final treatment unit and the construction of the 2nd line of MWT. Modernization of wastewater treatment plants will help reduce water withdrawal from the Ural River through the use of a multi-stage wastewater treatment system, which will remove up to 99% of pollutants from wastewater and, therefore, multiply the reuse of water. Completion of the project is scheduled for the end of 2023.

Biodiversity Conservation and Environmental Monitoring

GRI 103-1, 103-2, 103-3, 304-1, 304-4, OG4

We recognize that biodiversity is a security of ecological well-being.

Biodiversity management is based on the following key principles:

- Identification and assessment of environmental and social risks and impacts. To do this, when planning future activities, we assess the possible impacts that may be caused to biodiversity. In accordance with international practice, to monitor changes in the environmental situation in contract areas in the process of exploration and development of oil fields, as well as to assess and clarify possible

damage to biodiversity, we conduct regular environmental monitoring, paying particular attention to specially protected natural territories and protected areas;

- Implementation of preventive and preventive measures or measures to reduce the impact, and in the case of persistence of residual effects – compensatory measures to compensate the consequences of adverse effects;
- Continuous improvement of the management system in the field of health, safety and environmental protection.

Natural areas of our operations under protection and affected species of flora and fauna

Conservation zone of the Northern Caspian of republican significance

The Northern Caspian is the most productive part of the Caspian. The biological resources of this part of the sea are very large. The main commercial objects of ichthyofauna are 25 species, of which the most valuable are sturgeon, constituting more than 70–80% of their world reserves in the basin.

Water area of the eastern part of the North Caspian with deltas of Volga River (within the RoK) and Ural River are included into state conservation area in the north part of the Caspian Sea. Wetlands of the north part of the Caspian, especially deltas of rivers Volga, Ural and Emba, as well as adjoining coast and water area of the sea, are the most important agricultural lands on the Eurasian continent, which provide support to millions of swimming and semiaquatic birds during nesting, mew, seasonal migration and wintering. One of the largest in Eurasia, the Siberian-Black Sea-Mediterranean flyway, passes through the Northern Caspian.

Based on background research, more than 70 species of birds migrate through the open

areas of the North-Eastern Caspian Sea, located at a distance of 20–60 km from the coast (5 of them are rare species listed in the Red Book of Kazakhstan). In the coastal zones, the small white egret, spoon-bill, nesting pelicans, the whooper swan, the white-eyed black and the black-headed gull nest. Sultanas, White-tailed Eagle and Osprey are also marked there.

Five RoK Red Book species of birds nest there as well. The most numerous is steppe eagle. Rare birds can be encountered such as avoset, sandpipers, magpies, small white egret.

The only large marine mammal (detachment of pinnipeds) living in the Caspian Sea is the Caspian seal (*Phoca caspica*). It is an endemic species of mammal. Seals are distributed throughout the Caspian Sea, but their number in the Northern part varies with the season. The nature of the seasonal distribution of animals in the sea area is determined by the three main phases of the annual cycle: reproduction, molting and feeding season. Breeding sites are located in the northern Caspian in the freezing winter. The feeding season from April to September, the seals spend mainly in the Middle

Location and scale of production activities in relation to key biodiversity areas



Site	Location	Key biodiversity areas (KBA)	Location in relation to KBA	Contract Area (sq. km)	Impact reduction plan
Kansu	Karakia district of Mangistau region	Kenderli-Kayasansky Reserve Zone and Ustyurt State Reserve	Located in a conservation area and located near the reserve	4,374.6	Decided to withdraw from the Project
Samtyr	Southeast Mangistau region	Kenderli-Kayasansky Reserve Zone and Ustyurt State Reserve	Located near the reserve	10,396.9	Exploratory design stage
Urichtau	Mugalzhar district of Aktobe region	State natural complex reserve of local significance “Kokzhide – Kumzhargan”	Includes part of the territory	239.9	Hydrogeological monitoring
Alibekmola and Kozhasay	Mugalzhar district of Aktobe region	Sands Kokzhide Kokzhide groundwater	Located near	156.5	Hydrogeological monitoring
Zhambyl	Kazakhstani sector of the Caspian Sea Atyrau district	Special environmentally sensitive zone of Kazakhstani sector of the Caspian Sea, Novinsky reserve	Located in a conservation area and includes part of the territory	1,935.2	Regular environmental monitoring, restrictions on offshore oil operations
Isatay	Central part of Kazakhstani sector of the Caspian Sea, Northern Mangistau region	Special environmentally sensitive zone of Kazakhstani sector of the Caspian Sea	Located in a conservation area	1,060	Seasonal background environmental studies, Regular environmental monitoring

and Southern Caspian. In the summer, a small number of animals live in the North Caspian (about 30,000 individuals), the majority of the population is located in the deeper and colder waters of the South Caspian. In late autumn, they migrate to the northern shoal area, where the water begins to freeze. Most of the population is collected in the Northern Caspian in October–November.

Continuous monitoring and timely protective measures are required for such territory, which is important for preservation of biodiversity of Kazakhstan and the whole Eurasian continent. KMG paid attention to environmental

protection of this region since start of its activity in the North Caspian. In full compliance with the requirements of environmental legislation, the regime of use of the water area, environmental requirements during the implementation of economic activity and compliance with the principle of “zero discharge” were observed.

Novinsky state natural (zoological) sanctuary of the republican significance was found for the purpose of creation of optimal conditions for fauna and flora reproduction, including listed in the Red Book of the RoK. Security arrangement is protection.

Zhambyl area is located in the northern part of the Caspian Sea. The contract territory is located within the reserve zone of the Caspian Sea, as well as partly within the Novinsky wildlife sanctuary reserve, but the production sites do not affect environmentally sensitive areas. This site complies with restrictions on conducting production operations in a period of high environmental sensitivity. During the study period, no abnormal natural phenomena of the state of the environment or non-natural factors causing concern or increased attention were recorded in the water area.

Isatai area is located in the northern part of the Caspian Sea, 45 km north of the coast of the Bozashi Peninsula, in Mangistau Region.

Myortvyi Kultuk (Ustyurt) is the habitat of the most characteristic representative of the Caspian Sea – flamingo, formerly widespread in the northeast, and still using this part of the sea, molting and flying birds in the Komsomolets Bay area and Dead Kultuk and Korak Bay. Flamingo (*Phoenicopterus roseus*) is a locally nesting species with a declining number. The only representative of the genus in the fauna of Kazakhstan. The main nesting sites in Kazakhstan to date are Lake Tengiz, Lake Chelkarteniz and the northeast coast of the Caspian Sea.

The Komsomolets Bay area, the Sorts Dead Kultuk and Kaidak are still regularly used by thousands of birds spending their summers here. Birds from the colony of Central Kazakhstan fly through these areas, increasing the local non-breeding population in April and August–September. Through the Gulf Komsomolets annually migrate up to 35 thousand individuals.

Mangistau area. There is an extensive network of specially protected natural territories on the territory of Mangistau Oblast, including the Ustyurt State Nature Reserve and the Kenderli-Kayasan Reserve Zone of republican significance, as well as 8 reserves and 1 natural park of regional subordination. Among the species of reptiles living in Mangistau region, there is *Elaphe sauromates* which is listed in the Red Book of the Republic of Kazakhstan (2010). The Central Asian tortoise, which is a common, widespread species in Mangistau, is quite numerous in places, however, according to the criteria of the Red List of the International Union for Conservation of Nature (IUCN), it has the status of vulnerable species.



Kenderli-Kayasanskaya conservation area of the republican significance was found for the purpose of preservation of habitat and natural reproduction of houbara bustard and saker falcon. Established modes: reserve status, protection regime, regulated regime.

Ustyurt state natural reserve is related to the first-class specially protected areas of the republican significance. Purpose of reserve establishment – preservation of natural complex of north deserts of Ustyurt in natural state, including rare species of flora and fauna. Security arrangement is protection. The reserve is a key habitat for a number of species listed in the Red Book of the Republic of Kazakhstan and (or) the International Red Book of IUCN: gazelle, Ustyurt mountain sheep – Urial, Caracal, honey badger, saker falcon, golden eagle, eagle owl, vulture, bustard beauties, etc. According to leading experts, the USPP meets the criteria for UNESCO World Cultural and Natural Heritage sites and in the future can receive this honorary status indicating the highest international level of recognition of its value.

For the first time in the history of observations of the Ustyurt GPP in 2018, a live front Azahit leopard was found. Previously, the leopard in Kazakhstan was known only for 3 facts of the human production of this animal, including in Mangistau region in 2007 and 2015. In Mangistau, leopards periodically come from neighboring Turkmenistan and, given the satisfactory food base (urials and gazelles), could probably form a local population here if there is no harassment from humans and proper protection of their habitats. The distance from the Ustyurt reserve to Kopetdag in Turkmenistan, where the leopard reliably lives now, is at least 600 km.

History Case:

KMG, together with the Ministry of Agriculture of the Republic of Kazakhstan, the United Nations Development Program in Kazakhstan (hereinafter referred to as UNDP) and the NGO "Association for the Conservation of Biodiversity of Kazakhstan" (hereinafter referred to as ACBK) discussed compensatory measures of harm caused during the planned work at the Kansu and Samtyr sites. The results of the second stage of the expedition to assess the state of biodiversity in South Ustyurt, held in April–May 2018, were also discussed. The expeditionary research was carried out within the framework of the implementation of the project MSF / 203/17 "Desert Initiative of Central Asia" with the assistance of UNDP and ACBK. Also given are estimates of some anthropogenic threats to the biodiversity of the region and recommendations for their

compensation, which subsequently formed the basis of the new environmental policy of the Company. For example, the Company will commit itself to preventing illegal hunting and fishing, both on the part of its employees and the side of its contracting companies. Moreover, the intention not to carry out activities in specially protected natural areas will become one of the points of the new environmental policy of the Company. It has been decided to award the southern part of the Ustyurt Plateau with special status, including the Kaplankyr chink, within the Karakiya district of the Mangistau region, as a reference intact region of the biome of the Turanian deserts with cold winters, which is a key habitat for a number of species listed in the Red Book of RoK, including for gazelle and honey badger.

It should also be noted that the leopard is currently not listed in the fauna list of Kazakhstan and the Red Book of RoK. Employees of the Ustyurt GPP have already sent an appeal to the Committee of Forestry and Fauna of the Ministry of Agriculture of the Republic of Kazakhstan with a proposal to immediately include the Persian leopard in the Red Book of the Republic of Kazakhstan, which will ensure the necessary legal status for its effective protection.

Over the past decades, the presence of a number of new mammal species for the region has been revealed: a white-bellied arrowhead in Western Ustyurt, a sharp-haired moth and a red female party in North Ustyurt, a honey badger in South-West Ustyurt, a jackal in plain Mangyshlak and Karagiye depression and raccoon dog. A meeting of the striped hyena in Western Ustyurt and traces of the presence of an Indian porcupine in the region, information about which has not been here for more than 40 years.

The Kansu section is located in the Karakiyansky district of the Mangistau region, partly within the Kenderli-Kayasansky reserve zone and borders with the Ustyurt state natural reserve (2 km buffer zone from the site borders). In 2016, exploration

work at the site was not carried out. Given the high geological, environmental risks, as well as economic unprofitability, KMG made a strategic decision to withdraw from the project. In 2019, the contract territory will be returned to the state.

Samtyr section. Since 2018, KMG is the owner of a 50% stake in "Samtyr" LLP, located in Mangistau Oblast. Located within the South Ustyurt sedimentary basin in the immediate vicinity of the fields Uzen, Shahpaty, Dzhel.

State natural local complex reserve "Kokzhide – Kumzhargan". There are two objects of natural-reserved fund of the republican significance: sands Kokzhide and underground waters Kokzhide, which are included into the List of geological facilities of the state natural-reserved fund of the republican and international significance.

The Urikhtau, Alibekmola and Kozhasai fields are located in the Mugalzharsky district of the Aktyubinsk region of Kazakhstan. The northwestern part of the contract area of the Urikhtau deposit is located on the sands of Kokzhide, the deposits also border the Kozhide-Kumzhargan state natural complex reserve of local significance. In order to prevent groundwater

pollution, work is carried out on regular monitoring of the state of the environment, both in the area of operations of the Group

companies and in the area of the Kokzhide sand massif adjacent to the Contract Area.

Production sites, located within the border and specially protected natural reservations

Type of the specially protected natural reservation	Inside borders	Adjacent bodies (part of territory is included)	Outside borders (located near 1-5 km)
IUCN I-IV category	0	0	Kansu Samyr
IUCN V-VI category	Zhambyl Satpayev Isatai Myortvyi Kultuk (Ustyurt)	Zhambyl Urikhtau	Alibekmola Kozhasay
World Heritage sites	–	–	–
Ramsar lands	–	–	–

The implementation of hydrocarbon production projects in the immediate vicinity of the reserve’s borders, the development of appropriate infrastructure and the emergence of a large number of people with heavy machinery can adversely affect the unique nature of Ustyurt and lead to the disappearance of the South Ustyurt populations of a number of “Red Book” species.

At the same time, according to experts, it is quite possible to make compromise decisions that not only ensure the socio-economic

development of the region, but also allow preserving Mangistau’s unique natural and cultural heritage. In particular, as the most important compensatory measures to minimize damage from the development of the Kansu and Samtyr deposits, it was proposed to expand the UGPP protection zone to 5–10 km and create a new specially protected natural area “South Ustyurt”, including the Kaplankyr chink near Kazakhstan’s state border with Turkmenistan and Uzbekistan. In an optimal variant, a cluster of the Ustyurt GPP should be created in this territory.

Number and percentage of significant operating sites where the biodiversity risk for 2018 was assessed and monitored

304-2, OG4

In 2018, background environmental studies (Isatay), well drilling and testing (Zhambyl) were conducted in areas located in the state reserve zone in the Northern part of the Caspian Sea. At the present stage of activity in these areas, anthropogenic impact is not significant and does not prevent the free movement of wild animals and birds in their habitats. During drilling, the following types of work have impact on the environment: rig installation, drilling and testing of wells, shipping. Impact factors are: an increase in suspended matter concentrations in the water during construction at sea, a violation of the natural

structure of bottom sediments, including under the influence of intensive navigation, the physical effects of noise.

On the Urikhtau section, or bordering on specially protected land areas, the construction of an appraisal well at the East Urikhtau field and the construction of an appraisal directional well in the South Urikhtau field began. Groundwater impact factors are the direct drilling of wells, which can be a source of groundwater pollution. Pollutants can also get into groundwater with infiltrating precipitation from surface sites of industrial

and household waste, oil-contaminated areas, oil storage sites and stratum waters. In this regard, KMG is taking a number of measures aimed at protecting groundwater and preventing their pollution, clogging and depletion. A well design is provided to insulate groundwater strata using conductors lowered to a depth of 80–85 meters, as well as organizing regular monitoring of the conditions of occurrence, level and quality of groundwater in areas of existing and potential pollution.

Another factor influencing the industrial development of territories on biodiversity is power lines, which rearrange a serious danger to the avifauna. The network of overhead power lines (OHTL) is constantly expanding, intruding into the natural habitats of birds and often becoming the cause of their mass death. This problem is particularly relevant for birds of prey found in treeless steppe and semi-desert regions, where the OHTL towers are most attractive for these birds as perches.

Thus, the presence of an average-capacity (6–10 kV) average 60 km long power

transmission line between the Kenderli UGPP cordon and the Tulep village has a negative impact on the populations of birds of prey in the Ustyurt State Natural Reserve and in the adjacent territory of Southern Ustyurt. Every year on this line in the area of the Kenderli boundary there are numerous facts of the death of birds of prey from electric shock, including those related to species listed in the Red Book of the Republic of Kazakhstan (golden eagle, steppe eagle, owl).

KMG, in order to find ways to solve this problem, in November 2018, took part in the Round Table on the topic of “Death of rare bird of prey species on high-voltage power lines: problems and possible solutions”, the main purpose of which was to obtain initial information on existing facts of bird deaths on high-voltage power lines. The experts noted that the problem of protection of birds from electric shock should be paid attention to even during the design, coordination and construction of new high-voltage power lines. The most optimal solution to this problem is the use of modern effective bird protection devices (BPD).

Percentage of significant operating sites where the biodiversity risk for 2018 was assessed and monitored

	Land-based operation		Offshore marine operations	
	2017	2018	2017	2018
Biodiversity areas is covered by an EIA or similar document (%)	100	100	100	100
Areas where environmental monitoring is conducted regularly (%)	100	100	100	100
Areas with abandoned wells that regularly monitor abandoned wells (%)	100	100	100	100

Offshore oil spill prevention

The Caspian Sea is a closed reservoir, the fragile ecosystem of which is especially sensitive to oil pollution. Prior to the start of any type of work at sea, background environmental studies are carried out in contract areas to assess potential social and environmental impacts. Impact monitoring, emission monitoring and emergency monitoring are also carried out – during and after operations. And upon completion of work, continuous environmental monitoring of abandoned wells is ongoing.

The absolute priority for the Company is to ensure constant preparedness for the elimination of all possible emergency oil spills before drilling operations at sea begin. Therefore, the Group has a system for ensuring prompt and effective response to emergency situations, including oil spills and the implementation of appropriate operations to eliminate their consequences. To increase the level of preparedness for oil spill response (hereinafter – OSR), practical and theoretical exercises, trainings and exercises of various levels are regularly held to improve the practical skills of personnel.

In the event of a possible spill, contracts are also concluded with specialized companies for the elimination of oil spills of the first and second levels. In the event of a spill of the third level, an agreement is concluded with the international association Oil Spill Response Limited, specializing in the elimination of accidents at offshore oil and gas fields.

In 2018, before the start of the construction of the appraisal well in the Zhambyl section, to ensure readiness for the OSR, an agreement was concluded with a consortium represented by “KMG Systems & Services” LLP, “Kazmortransflot” LLP and Republican State Enterprise on the right of economic management “Professional Militarized Emergency Rescue

Service”. For the entire period of construction of the appraisal well, the vessels for the OSR were in the 500 meter zone from the rig.

Also, the Operator at the Zhambyl site conducted a series of command and staff exercises on first and second level OSR with the participation of representatives of state bodies in the field of industrial safety and ecology.

A subsidiary of “KMG Systems & Services” LLP owns the North Caspian Environmental Oil Spill Response Base in Atyrau Oblast, the only specialized facility in Kazakhstan intended for OSR.

During the reporting period, no oil spills were recorded in the Caspian Sea.

Climate Change and Air Quality

GRI 103-1, 103-2, 103-3, 305-1, 305-2, 305-3, 305-4, 305-5, 305-6, 305-7

In 2018, the Emission Management Policy was developed in the KMG group of companies, where the main principles of managing activities to reduce the harmful effects on the atmosphere are defined:

- 1) carrying out activities in strict accordance with legislative requirements and other obligations of the Company;
- 2) compliance with the established emission standards and emission limits, quotas for greenhouse gas emissions;
- 3) a clear distribution of roles and responsibilities, increased competence, training and awareness;
- 4) conducting regular accounting, inventory and monitoring of emissions;
- 5) the termination of the regular combustion of crude gas in the extraction of hydrocarbons;
- 6) taking measures to reduce greenhouse gas emissions and reduce the carbon footprint;
- 7) carbon asset management;
- 8) continuous improvement of emission management activities.

We give primary attention to measures to minimize negative impact of our activities on the environment, observing the requirements of environmental legislation, rationally using natural resources and constantly improving environmental protection activities. Our priorities are the careful and rational use of natural resources, the minimization of environmental risks. Targeted programs are aimed at reducing the combustion of crude gas in flares, developing green energy based on renewable energy sources and improving overall energy efficiency.

KMG controls the activity of subsidiaries and dependent entities in the area of greenhouse

gas emissions and air contaminants, monitors timely receipt of all necessary permits for operations, such as emission permits, GHG quota, gas flaring permits etc. at corporate center level. We develop environmental measures air protection, including inventory of emission sources of pollutants and greenhouse gases, development of project document, organization of industrial environmental control and monitoring, modernization of equipment, leading to reduction of pollutant emissions.

Programs for minimizing exposure to atmospheric air are: implementation of programs for the development and processing of crude

gas in the extractive sector, a program to modernize refineries, the use of the latest available technologies in the construction of new facilities in the transportation sector, etc. Phased implementation of programs will reduce emissions of pollutants and greenhouse gases to the atmosphere, increase the beneficial use of crude gas.

The Company adheres to the requirements of national legislation, advanced international standards, the provisions of the Company's internal documents in the field of occupational health and safety, environmental protection and other internal corporate documents, carries out identification and assessment

Greenhouse Gas Emissions

The Company strives to increase the production of oil and natural gas to meet the growing global demand for energy, and therefore we give priority to measures to minimize the negative impact of our activities on the environment, observing the requirements of environmental legislation, rationally using natural resources and constantly improving environmental protection activities.



For the first time, KMG has developed a Carbon Disclosure Information Project under the Carbon

Disclosure Project (CDP), which disclose data on direct and indirect greenhouse gas (GHG)



emissions for 2018 for all KMG assets, including international (Romania, Georgia). Data on GHG emissions for 2018 will be verified and will be available at the CDP site on following link:

<https://www.cdp.net>*

Calculation of greenhouse gas emissions is based on methodological guidelines for calculation of greenhouse gas emissions, approved by the authorized body, and cover following greenhouse gases: carbon dioxide

* The Questionnaire will be posted on the CDP platform in mid-2019. To view the Questionnaire, follow the link in the "Search" section and enter the company name in English: "KazMunayGas National Company JCS". Methodology for calculating greenhouse gas emissions, as well as the disclosures 305-2, 305-3, 305-4, 305-5, were described and posted on the CDP site.

of environmental risks, ensures transparency and openness of our actions in the field of environmental protection.

The Company continues to work on improvement of activities of production facilities on reduction of impact on atmospheric air. We take active part in improvement of the country's regulatory legislation, hold meetings of the Working Group on Emissions Management, participate in forums and conferences on climate change, improve our knowledge and skills in order to increase our abilities on implementation of strategy on emissions reduction.

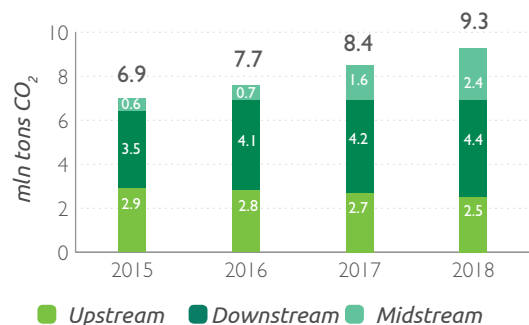
(CO₂); methane (CH₄); nitrogen oxide (N₂O); perfluorocarbon (PFC).

The approach to establishing organizational boundaries of reporting was determined on the basis of international recommendations of the GHG Protocol, according to which data on direct and indirect emissions were consolidated using the operational control approach.

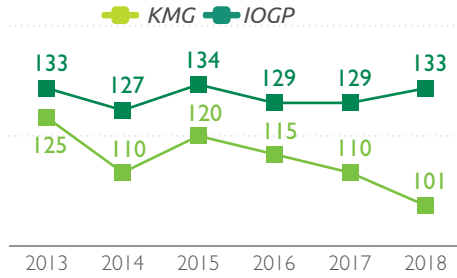
According to the results of 2018, carbon dioxide emissions in the KMG Group of companies amounted to 9.3 million tons (8.4 million tons in 2017). The increase in emissions is due to the increase in gas transportation volumes and addition of new sources.*

* Data for 2017 differ from the data in the 2017 report in the amount of 1.9 million tons of CO₂, due to the expansion of reporting limits and the inclusion of international assets

Direct greenhouse gas emissions by business area

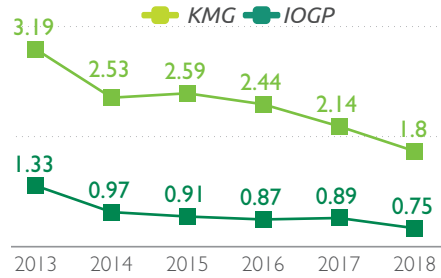


Emissions intensity CO₂ in Upstream, ton/1,000 tons



Volume of direct greenhouse gas emissions by business area “Hydrocarbon production” was 2.5 million ton of CO₂ in 2018, which 7% lower than the level of the previous year (2.7 million tons in 2017). The main reduction of CO₂

Emissions intensity CH₄ in Upstream, ton/1,000 tons



Graph Data Source:



emissions is associated with the measures taken to reduce flaring of associated gas, respectively, the indicator of the intensity of CO₂ and methane emissions decreases.

	Units	2015	2016	2017	2018
Level 1. Direct emissions					
Breakdown by area of activity					
Upstream	mIn t CO ₂ equiv. ¹	4.9	5.0	4.4	4.2
Downstream	mIn t CO ₂ equiv. ¹	3.5	4.2	4.3	4.4
Midstream	mIn t CO ₂ equiv. ¹	3.2	3.7	5.2	6.1
Breakdown by countries					
Kazakhstan	mIn t CO ₂ equiv. ¹	10.7	11.8	12.8	13.7
Romania	mIn t CO ₂ equiv. ¹	0.9	1.1	1.0	1.0
Georgia	mIn t CO ₂ equiv. ¹	0.02	0.01	0.02	0.009
Emissions breakdown by type of greenhouse gases					
CO ₂	mIn t CO ₂ equiv. ¹	9.3			
CH ₄	mIn t CO ₂ equiv. ¹	5.4			
N ₂ O	mIn t CO ₂ equiv. ¹	0.02			
Level 2. Indirect emissions					
	mIn t CO ₂ equiv. ²	2.5	2.5	2.7	3.2
Level 3. From using sold products					
	mIn t CO ₂ equiv. ²				71.3

Over the past two years the emission intensity has increased in the “Downstream” business direction owing to increased refinery yield

and the introduction of new facilities as part of the modernization work (data are presented for 3 Kazakhstani refineries).

¹ IPCC Fifth Assessment Report (AR5 - 100 years)

² The methodology used is described in the CDP report: https://www.cdp.net/en/formatted_responses/responses?campaign_id=66216852&discloser_id=850098&locale=en&organization_name=KazMunayGas+National+Company+JCS&organization_n=&project=nproject@number=eryproject_number=Programm%2F%2Fcdp.credit360.com%2Fsurveys%2F9hz110bc%2F67889&survey_id=65670419.

In the “Midstream” business area, there is an increase in emissions intensity associated with an increase in gas transportation (for export) and the commissioning of new plants.

The calculation of the emission intensity for the business area “Gas Transportation” will begin in the coming years after the launch of new facilities at several gas transmission organizations.

Methane Leak Direct Detection Project

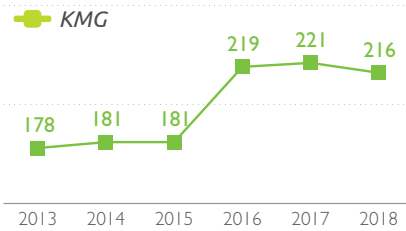
Since 2017, KMG has been a member of the Global Methane Initiative (GMI) project network. In 2018, pilot projects were carried out to detect and quantify methane leaks at the Company’s production facilities in Mangistau Oblast.

One of the basic principles of the Emission Management Policy is Subparagraph of Principle 6: The company takes measures to prevent methane leaks at production facilities by conducting campaigns to detect and quantify methane leaks, install floating cisterns in new tank farms, introduce light oil fractionation plants, the use of mobile compressor stations in the repair of gas pipelines.

KMG took part and represented the Republic of Kazakhstan at the meeting of the GMI Oil and Gas Subcommittee during the Global Methane Forum held in April 2018. in Toronto (Canada). KMG participates in the international project of the United Nations Economic Commission for Europe “Project on MRV (monitoring, reporting and verification) and reducing methane emissions in the oil-producing and extractive industries”.

In order to minimize the impact of gas storage, 3 underground gas storage facilities are used to store natural gas (UGS). The largest of them UGS “Bozoy” (with an active storage capacity of 4,000,000 thousand m³) is located in the Aktobe region (UMG “Aktobe”). There are also UGS “Poltoratskoe” (with an active storage capacity of 350,000 thousand m³), located in the Turkistan region (UMG “Shymkent”), as well as the UGS “Akyr-tobe” (with an active storage capacity of 300,000 thousand

Emissions intensity in Downstream, ton/1,000 tons



History Case:

Due to the launch of the integrated gas processing unit at the Prorvinskaya group of fields, the volume of direct GHG emissions from the flare in this organization was reduced by 80% and amounted to 41.5 thousand tons (211.6 in 2017).



m³), in the Zhambyl region (UMG “Taraz”). Underground gas storages are intended to provide consumers with natural gas during the winter seasons, as well as during periods of reduced gas supply.

CO₂ emissions from biomass burning or decomposition are not included.

In its activities, the Company does not release ozone-depleting substances that affect climate change. Periodic control and monitoring are conducted.

Air quality

We conduct industrial environmental monitoring and take measures on reduction of emissions of pollutants into the atmosphere, formed in the result of operations and production processes. As part of industrial environmental monitoring programs, emissions to the atmosphere are monitored at designated sampling sites and measurements are made to assess potential impacts. The main amount of pollutant emissions is generated as a result

of fuel gas combustion in boilers, process furnaces and compressors, gas turbine plants, compressor stations, gas flares, etc.

The actual gross amount of emissions of all pollutants for the Group in 2018 amounted to 269 thousand tons (in 2017, 256 thousand tons). There is a slight increase in emissions due to the introduction of new sources into operation.

Gross emissions of pollutants into the atmosphere in the KMG Group of companies, thousand tons

	2016	2017	2018
Emissions of pollutants into the atmosphere, in total, including:	241.1	256.3	269.3
NOx emissions	12.9	13.8	16.7
SOx emissions	16.9	14.8	13.6
emissions of other pollutants	211.3	227.7	239.1

In “Upstream” business area, emissions of pollutants are reduced by 16% due to an increase in the beneficial use of crude gas and a corresponding decrease in its flaring. In “Downstream” and “Midstream” business areas, an increase in emissions of 10–12% is observed due to the commissioning of new sources and the growth of gas exports.

Sulfur production facilities were commissioned in all plants. With implementation of this project, hydrogen sulfide gas will undergo regeneration, while simultaneously obtaining an important production product – marketable sulfur. This affects the reduction of pollutants

in the exhaust gases of road transport and the improvement of air quality in populated areas. The sulfur content in gasoline K4 is 10 times less than in the fuel produced before the modernization of the plant.



As a result of carried out projects for the modernization of oil refineries, environmental indicators of fuel produced by plants were improved by producing oil products of European quality standards corresponding to K4 classes in accordance with the requirements of the Technical Regulations of the Customs Union.

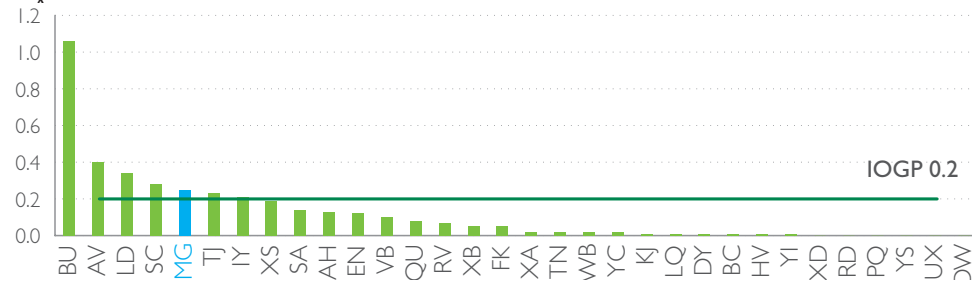
Specific emissions of pollutants in the KMG Group of companies

	2016	2017	2018
Mining of hydrocarbons, t/1,000 TOE of extracted hydrocarbon raw materials	2.14	2.35	1.93
Oil refining, t/1,000 tons of refined oil	3.3	3.3	3.3
Oil transportation, t/1,000 tons of oil transported	0.5	0.5	0.5
Gas transportation, t/1,000 TOE transported gas	1.4	1.2	1.4

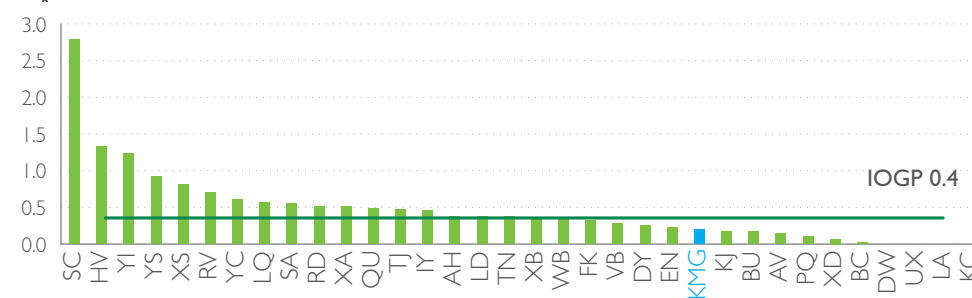
There is a decrease in emissions of sulfur oxide/sulfur dioxide in comparison with 2017 by 9% due to the reduction of gas flaring in oil-producing assets, as well as measures to reduce emissions in “Downstream” and “Midstream”

business areas. NO_x emissions increase in 2018 associated with an increase in gas exports and the introduction of new installations in enterprises.

SO_x emissions per thousand toe of raw hydrocarbon production in 2018



NO_x emissions per thousand toe of raw hydrocarbon production in 2018



History Case:

In order to reduce the impact on the air, the following measures were taken as part of the modernization of the refinery. The PKOP modernization project has been implemented in two phases. At the first stage of modernization, production of motor fuel of environmental classes K4 and K5 (analogues of Euro-4 and Euro-5) was mastered, in accordance with the requirements of the Technical Regulations of the Customs Union. Construction of an isomerization unit with a capacity of 600 thousand tons per year has been completed. In July 2017, isomerization unit was commissioned with the release of K4 and K5 classes of fuel.

The second stage of modernization is set aside to increase the capacity of the plant to 6 million tons of oil per year and the depth of oil refining.

In December 2015, a sulfur production unit with a capacity of 4 thousand tons per year was commissioned. Installation is aimed at utilization of acid gases, previously burnt on a flare, with sulfur production with mass purity

of more than 99.9%. Due to commissioning of UPS-4000 tons, emissions of sulfur dioxide (SO₂) into the atmosphere decreased by 21%. Installation of point loading of petroleum products in the plant was commissioned. With the commissioning of the Point Loading Equipment for light oil products, emissions of volatile hydrocarbons into the atmosphere were reduced when filling, the share of volatile hydrocarbons was reduced by 7%.

Connecting furnaces of existing technological installations and facilities for modernization and reconstruction to natural gas makes it possible to reduce emissions of pollutants and greenhouse gases into the atmosphere. In 2019, it is planned to replace 44 nozzles on LK-6U furnaces with nozzles of an improved, energy-saving design. When replacing the injectors, the reduction of pollutant emissions into the atmosphere will be 135.8 tons per year.

Gas-flare unit commissioned. The installation provides safe removal of process gases, the height of the barrel is 137 m. This allows emissions to be better dispersed in the atmospheric air, which significantly reduces the burden on the environment.

The Company does not yet make direct measurements using, for example, gas analyzers in real time, however, under the new Environmental Code, the authorized environmental protection agency is planning to switch to automated monitoring of pollutant emissions by installing sensors / gas analyzers at emission sources at environmental facilities 1st category. Currently, a number of organizations are developing project documentation for switching to online monitoring of pollutant emissions.



Average ratio of NOx emissions to total raw hydrocarbon production in oil equivalent by KMG Group of companies was 0.2 ton per thousand ton of raw hydrocarbon production in 2018, average IOGP indicator was 0.4. Compared to 2017, there is a 17% drop in NOx emissions. Average ratio of SOx emissions to total raw hydrocarbon production in oil equivalent for KMG Group of companies was 0,25 ton per thousand ton of raw hydrocarbon production, average IOGP was 20%. Compared to 2017, there is a reduction in SOx emissions.



The Company does not release persistent organic pollutants in its activity.

Beneficial use of crude gas



This section contains information on companies in the “Upstream” business area of the KMG Group.

One of goals in reducing greenhouse gas emissions is to increase the beneficial use and utilization of associated petroleum gas, minimizing flaring. Associated petroleum gas utilization in 2018 is the highest in the entire history – 93%, gas flaring is at 6 tons per 1,000 tons of produced hydrocarbons (11 in 2017), which is almost 50% lower than the average IOGP.



This was achieved due to the commissioning of a comprehensive gas processing unit (GPU) at the Provinskaya group of fields and a reduction in gas production and combustion in the oil-producing assets of the Aktobe region.

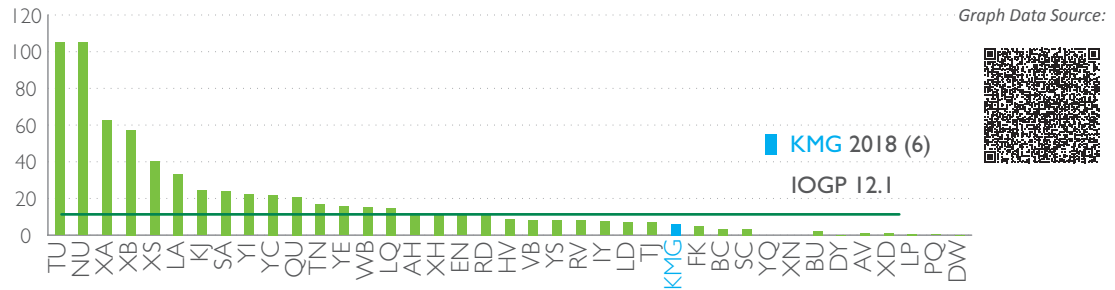
The volume of natural and associated gas production by the main producing companies of the KMG Group in 2018 amounted to 2,873 million m³ (including associated petroleum gas (APG) – 2,049.5 million m³), the volume of crude gas burned was 148.9 million m³. At the end of 2018, a modern gas processing complex was put

into operation in the Baiganinsky district of the Aktobe region at the Kozhasai field. The Head of the State opened its work online during a national teleconference dedicated to the Day of Industrialization. Commissioning of the integrated gas processing unit at the Kozhasai field into full-scale operation will significantly reduce gas flaring from 173 million m³ to 50 million m³, which will have a positive effect on the reduction of pollutant emissions (by 70%).

In 2015, KMG supported the World Bank’s initiative “Complete utilization of associated petroleum gas by 2030”. On November 20, 2018, working meetings were held with representatives of the World Bank Group



Benchmarking of APG flaring rate by industry



to discuss the status of the implementation of the initiative in KMG and possible cooperation to reduce regular burning of crude gas. Reporting on the volume of combustion

of crude gas under this Initiative is submitted on an annual basis.

The company does not recycle APG.

The volume of crude gas flaring

	2016	2017	2018
Total volume of crude gas flaring, million m ³	322.8	315.8	148.9
The beneficial use of APG, %	86	85	93
The intensity of burning of crude gas, t/1,000 produced by raw hydrocarbons	12	11	6

Construction of infrastructure and modern facilities for the utilization of crude gas make it possible to fully develop mining assets and significantly reduce greenhouse gas emissions and pollutants into the atmosphere.

In 2018, the average ratio of gas burned to total hydrocarbon production in oil equivalent for the KMG Group of companies was 6 tons per thousand tons of hydrocarbon production, the average IOGP was 12.1.

Waste Management

GRI 103-1, 103-2, 103-3, 306-2, 304-3, 306-4

Waste management in companies of the Group is one of the most important environmental aspects for KMG. Criticality lies primarily in the substantial amounts of hazardous waste formation inherent in the oil industry. For the quality control of this process, the Company develops a system for managing industrial waste, constantly improves the accounting for the generation and movement of waste, increases the potential for increasing waste reuse.

introduce higher world standards and industry practices. Companies of the Group develop and implement waste management programs, allocate substantial funds to solve problems associated with waste generation and land pollution at production facilities. Records of generated wastes are conducted throughout the entire contract area, including wastes generated by contracting companies. KMG also controls its contractors for compliance of their activities with the requirements for safe transportation, disposal and recycling. New approaches and technologies in the field of waste management for their introduction at production facilities are regularly studied.

The companies of the Group try to meet the requirements of the legislation in the area of waste management, as well as gradually

Volume of generated wastes in 2018 is 288.3 thousand ton (14% less than in 2017), among them 268.9 thousand ton were classified as “hazardous”, and 19.4 thousand ton as “unhazardous”. Most part of hazardous waste 67% are drill mud (drill cuttings and waste drilling mud). The reduction in total waste generation compared with 2017 was primarily due to the reduction in drilling waste generation.

More 80% of all generated wastes is transferred for processing to specialized companies under a contract. Other significant ways of waste management are: reuse, recovery, combustion and placement at disposal site.

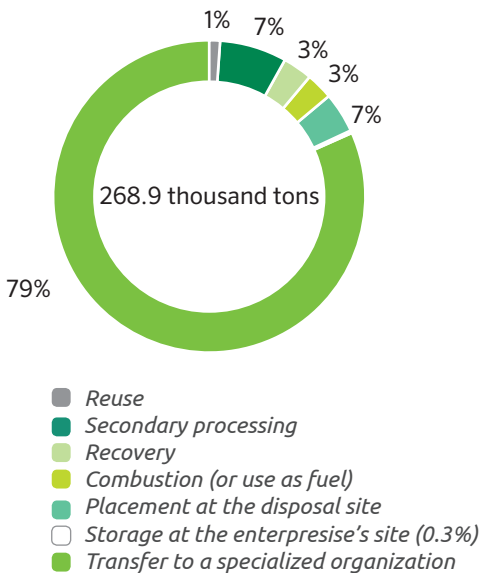
Given the enormous role that contracting companies play in the process of processing and disposing of KMG waste, the Company strives to improve the selection criteria of potential suppliers to ensure that work is performed at a high level and with full transparency throughout the cycle – from waste generation, transportation, to processing and final placement. In 2019, KMG plans to standardize the procedure for interaction with contractors and ensure the same high level of environmental management for both the KMG Group companies and their contractors.

KMG is also carrying out tremendous work on the recultivation of polluted land and sludge pits – pollution of the “historical heritage”.

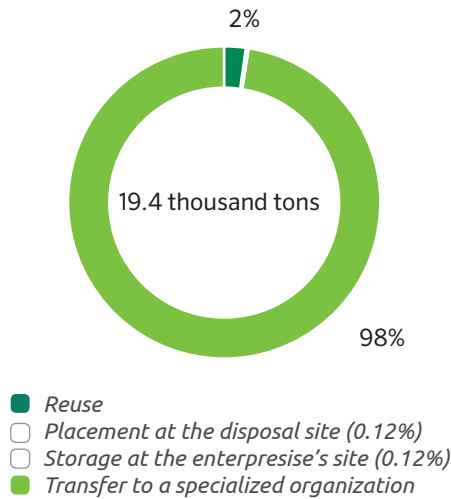
For each individual case, projects are being developed for the remediation of oil-contaminated lands, taking into account the climatic features of the region, the nature, volume and duration of pollution; selected the most effective methods for cleaning and remediation. This issue is controlled by the top management of the Company and is one of the highest priority at the moment. In 2019, a single roadmap for all historical pollution at KMG fields will be formed, and by 2024 the Company plans to completely eliminate them. For example, already in 2018, “Embamunaygas” JSC carried out the reclamation of historically contaminated lands in areas in the oil and gas extraction departments of Zhylyoymunaygas and Dossormunaygas – it cleared 24 hectares of oil-contaminated land (99.4 thousand tons of oily soil). Further works of Embamunaygas on the reclamation of historically contaminated lands will continue until 2022.

Much work in this direction is also being carried out by “Mangistaumunaygas” JSC. By the end of 2018, 6 oil waste storage sites were completely cleaned and disposed of. By the end of 2019, it is expected to clean up and eliminate the remaining 4 landfills. In the future, oil waste will not be stored on the company’s territory but will immediately be transferred to specialized organizations for processing.

Hazardous waste for 2018 by type treatment, %



Unhazardous waste for 2018 by type treatment, %

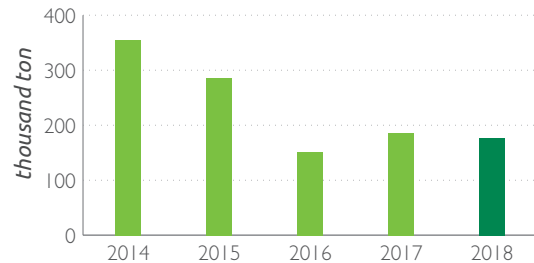


Drill mud generation



In 2018, Extracting companies of the KMG generated 176.4 thousand ton of drill mud (6% less than in 2017), including: 38.4 thousand ton of waste drilling mud; 138 thousand ton of drilling cuttings. All drill mud of extracting companies of the KMG Group is transferred to specialized organizations for disposal. Methods of further waste disposal by these companies: inertisation, thermal method, chemical method, biological remediation and dumping at special disposal sites.

KMG waste drilling mud generation



	Onshore projects		Offshore projects	
	Waste drilling mud, thousand tons	Drill cuttings, thousand tons	Waste drilling mud, thousand tons	Drill cuttings, thousand tons
2014	116.50	236.95	0.91	0.88
2015	83.08	200.62	1.14	1.10
2016	44.24	107.13	0	0
2017	49.50	134.28	0.99	1.06
2018	37.05	137.19	1.36	0.81

Transportation of hazardous wastes

KMG does not import/export hazardous wastes outside/within Kazakhstan.

COMPLIANCE WITH THE REQUIREMENTS



We try to conduct our production activity within the framework of the legislation of the Republic of Kazakhstan and to take appropriate measures to prevent environmental damage.

The Company will continue its work on detection of inconsistencies with the environmental legislation of the Republic of Kazakhstan at production facilities, on identification of problem issues and risks management to take measures on prevention of any inconsistencies with the requirements of the legislation.

For 2018, the environmental protection Group of KMG companies was charged with administrative fines, damages and tax payments for excess emissions in the amount of KZT 85.6 billion, of which the Company recognized and actually paid KZT 9.7 billion, contested in court 55.9 billion tenge. The remaining claims are disputed by the Company in court as unlawful.

One of the extractive companies was imposed an administrative penalty for disposing of production waste at landfills without permits for emissions into the environment for periods amounting

to KZT 55.9 billion. KMG was able to prove the illegality of the claim and in January 2019, by decision of the judicial division in civil cases, it was decided to cancel the administrative fines and tax payments and terminate the proceedings.

Another company for burning sour gas without a permit in the flare of the Complex Gas Treatment Facility imposed penalties of KZT 29.7 billion, including administrative fines, damages for environmental pollution and tax payments for excessive gas flaring. The reason for the excess of the acid gas combustion rate was the delayed launch of the LO-CAT desulfurization system at the CGTP. The desulfurization system began to work at the end of 2018, and the flaring of sour gas at the flare was immediately stopped. Of the amount claimed, in 2018 KZT 9.2 billion was actually paid. For the remaining amount, litigation is ongoing.

HSE TRAINING

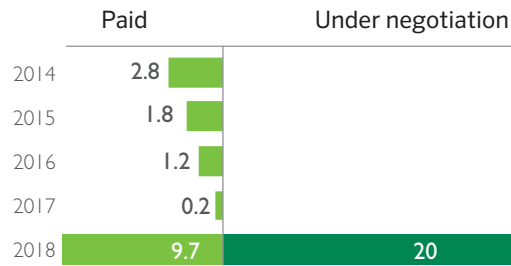
Despite the importance of technologies designed to reduce risk, no technological innovation can solve the problem of rash solutions. People continue to be the determining factor. Therefore, we are ensuring employee competence as an integral part of HSE control system development.

More than 45,458 people were trained in the existing 70/20/10 – on-site / internal / external / on-the-job training model implemented in the KMG Group of companies based on their own 6 Training and Course Plants / Centers on occupational health and safety, industrial and fire safety.

Own training centers are located in “Ozenmunaygas” JSC (Zhanaozen), “KazTransOil” JSC (Aktau), “Intergas Central Asia” JSC (Atyrau, Shymkent), “Pavlodar Petrochemical Plant” LLP (Pavlodar) and “Oil Services Company” LLP (Aktau).

In addition to the existing teaching staff in the centers for advanced training, line managers and highly qualified experts from

Environmental Fines 2014–2018, bln tenge



In 2018, non-financial sanctions were also applied to one of the Company’s oil refineries, namely, such requirements were set as: to adjust the design of permissible discharges, comply with established standards for the concentration of pollutants in wastewater, take the necessary measures to improve the efficiency of treatment facilities, develop plan for the modernization of treatment facilities. The Company carried out work on all of the above items.



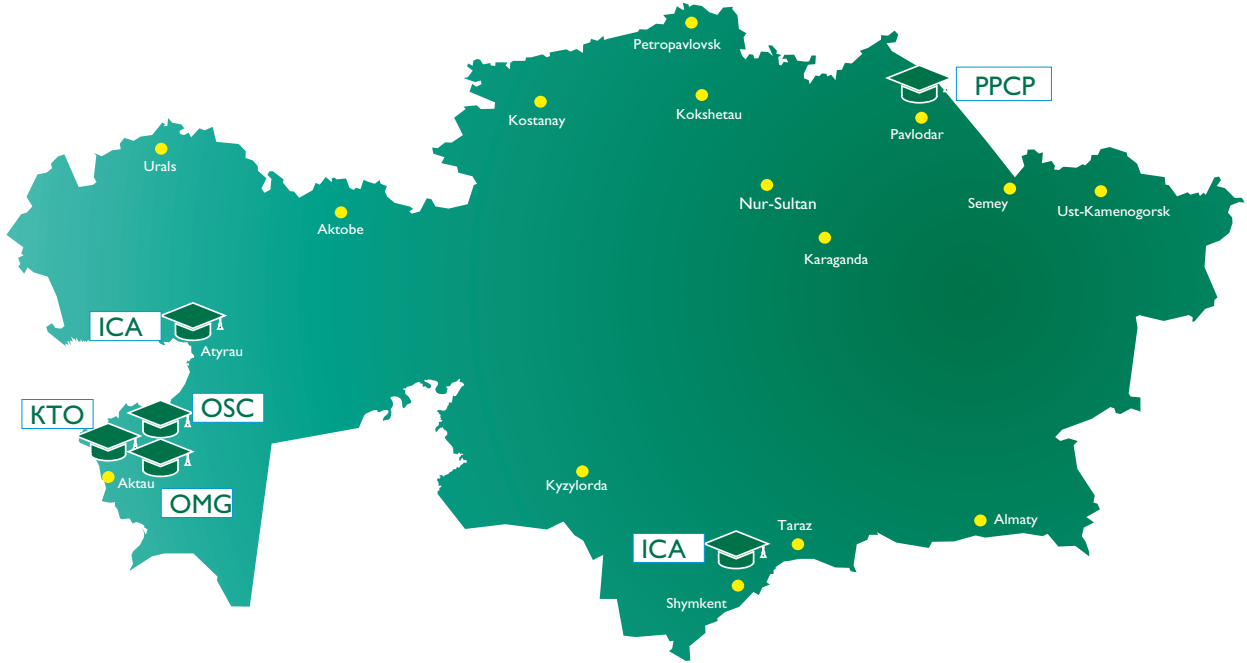
among the production personnel who have a long production experience are also involved.

There are mentoring and internal coaching programs among experienced workers implemented, master classes and trainings, various competitions among advanced workers are held, which allow to improve internal communications and motivate staff to strive to be the best in their profession.

In order to improve safety culture, in 2018, together with ExxonMobil, a free two-stage training course on the exchange of experience in the field of HSE and environmental protection was held, in which over 65 employees of the KMG Group of companies participated.

As part of the implementation of the new modules “Incident Management” and “Audits and Inspections”, training was conducted for 220 employees who are users of the system in the KMG Group of companies. Training took place in Aktau, Atyrau and Nur-Sultan.

KMG Training Overview



 Location of 6 KMG Group Training Centres

Six KMG Training Centres covered **34%** of HSE mandatory State legislation trainings for KMG Group

Remaining **66%** of mandatory by State legislation HSE trainings were done by 3rd parties for **1.1 billion KZT**

On the basis of “Mangistaumunaygaz” JSC in Aktau, training was conducted (seminar / training) on the topic: “Professional pathology and certification of workplaces on working conditions”, which was attended by about 40 health and occupational health professionals of the KMG Group. ■