PJSC Gazprom Environmental Report
2019

Efficient Growth

The Environmental Report features photographs taken by the employees of Gazprom's subsidiaries.
The photos were exhibited at the 7th Pristine Russia Festival in Moscow in January–February 2020.

PJSC Gazprom Environmental Report 2019

Message

Dear readers,

This is the Gazprom Group Environmental Report for 2019.

Sustainable development and preservation of the environment for the next generations are at the core of PJSC Gazprom's extensive business activities. The ongoing expansion of gas infrastructure and switching to methane-fuelled vehicles contribute to a large extent to regional environmental improvement and the implementation of the Clean Air national project.

The year 2019 proved to be of paramount importance for us, as it saw the launch of two large-scale gas transmission projects — the TurkStream offshore gas pipeline that secures gas supplies to the European and Turkish markets, and the first Russian gas pipeline to China — Power of Siberia. PJSC Gazprom is strongly committed to addressing environmental challenges of the European Union and China through these projects.

Gazprom is conscientious in ensuring environmental safety and preserving natural resources. In the reporting year, we succeeded in mitigating the Company's main negative environmental factors and achieving the corporate environmental goals. The Company introduced a comprehensive list of energy-saving measures and completed the implementation of ISO 50001:2018; PJSC Gazprom's Energy Management System was successfully certified for the compliance with the requirements of the standard. In 2019, Gazprom's Comprehensive Environmental Program for 2020–2024 was developed and approved, that envisaged a number of measures aligned with the national targets on innovative environmental development of the Russian economy.

By ensuring reliable supplies and satisfying the growing global demand for energy, Gazprom is implementing the best available techniques, focusing on energy performance improvements and reducing the carbon footprint of products. Our Company helps to shape the future that will be in tune with the United Nations Sustainable Development Goals and the Paris Agreement.

Oleg E. Aksyutin
Deputy Chairman of the Management Committee — Head of Department, Chairman of Gazpom Coordinating Committee for Sustainable Resource Management

Introduction

The present Environmental Report has been prepared in accordance with PJSC Gazprom's Management Committee Resolution On Organization and Holding of the Annual General PJSC Gazprom's Shareholders Meeting.

The Report uses annual statistical reporting data on environmental protection (EP) and energy efficiency collected by the corporate information & management system along with other content from nature protection reports, corporate websites, Russian and international publications by the Group's companies.

The Report highlights EP and energy efficiency activities of Gazprom Group's companies in 2019, including actual impact on air, water and land resources, waste management and measures undertaken to mitigate such an impact. The Report specifies the issues of EP management and financing arrangements, research and technical upgrade of the industrial complex aimed at enhancing environmental safety of Gazprom Group's facilities.

Data are provided in general for the Gazprom Group, PJSC Gazprom (including five-year retrospective data) and for some companies from the Group that significantly contribute to reviewed aspects of activities.

The terms PJSC Gazprom and the Company used in the Report refer to the parent company of the Gazprom Group, Public Joint Stock Company Gazprom and its 100% owned subsidiaries and organizations involved in hydrocarbons exploration, production, transmission, underground storage, processing and maintenance of the Unified Gas Supply System (UGSS):

OOO Gazprom dobycha Astrakhan
OOO Gazprom dobycha Irkutsk
OOO Gazprom dobycha Krasnodar
OOO Gazprom dobycha Kuznetsk
OOO Gazprom dobycha Nadym
OOO Gazprom dobycha Noyabrsk
OOO Gazprom dobycha Orenburg
OOO Gazprom dobycha shelf Yuzhno-Sakhalinsk
OOO Gazprom dobycha Urengoy
OOO Gazprom dobycha Yamburg
OOO Gazprom geologorazvedka
OOO Gazprom transgaz Volgograd
OOO Gazprom transgaz Grozny
OOO Gazprom transgaz Ekaterinburg
OOO Gazprom transgaz Kazan
OOO Gazprom transgaz Krasnodar
OOO Gazprom transgaz Makhachkala
OOO Gazprom transgaz Moscow
OOO Gazprom transgaz Nizhny Novgorod
OOO Gazprom transgaz Samara
OOO Gazprom transgaz Saint-Petersburg
OOO Gazprom transgaz Saratov
OOO Gazprom transgaz Stavropol
OOO Gazprom transgaz Surgut
OOO Gazprom transgaz Tomsk
OOO Gazprom transgaz Ufa
OOO Gazprom transgaz Ukhta
OOO Gazprom transgaz Tchaikovsky
OOO Gazprom transgaz Yugorsk
OOO Gazprom UGS
OOO Gazprom pererabotka
OOO Novy Urengoy gas chemical complex
OOO Gazprom energo
OOO Gazprom tsentrremont
OOO Gazprom geotekhnologii
OOO Gazprom nedra
OOO Gazprom gazomotornoye toplivo
OOO Gazprom avia Aviation Company
OOO Gazpromtrans
OOO Gazprom flot
OOO Gazprom invest
OOO Gazprom sotsinvest
OAO Gazpromtrubinvest

The terms Gazprom Neft Group and Gazprom Neft refer to PAO Gazprom Neft and its subsidiaries.

The term Gazprom neftekhim Salavat refers to OOO Gazprom neftekhim Salavat and its subsidiaries.

The term Gazprom energoholding refers to OOO Gazprom energoholding and its subsidiaries (PAO Mosenergo, PAO MOEK, PAO OGK-2, PAO TGK-1, PAO Murmansk CHPP, AO Saint-Petersburg heat distribution network, OOO TSK Mosenergo).

The Gazprom Group, Gazprom or the Group stand for PJSC Gazprom (with all listed above 100% owned subsidiaries and organizations) and the following companies:

Gazprom Neft Group
Gazprom energoholding
Gazprom neftekhim Salavat
Vostokgazprom Group
OOO Gazprom mezhregiongaz
AO Daltransgaz
Sakhalin Energy Investment Company Ltd. (Sakhalin Energy)
OAO Severneftegazprom
PAO Spetsgazavtotrans
ZAO Purgaz

as well as PJSC Gazprom's subsidiaries operating abroad:
OAO Gazprom transgaz Belarus
ZAO Gazprom Armenia
OsOO Gazprom Kyrgyzstan
Gazprom EP International B.V.

The Group's gas business companies comprise PJSC Gazprom (and all its 100% owned subsidiaries and organizations involved in hydrocarbons production, transmission, underground storage and processing, as well as UGSS maintenance), OOO Gazprom mezhregiongaz, Vostokgazprom Group (OAO Tomskgazprom), AO Daltransgaz, Sakhalin Energy Investment Company Ltd, OAO Severneftegazprom, ZAO Purgaz, PAO Spetsgazavtotrans.

The environmental impact indicators, ecological and economic indicators are given for Gazprom Group operations in the Russian Federation. Environmental performance abroad is reviewed separately.

Environmental management

Environmental management system

PJSC Gazprom adheres to the principles of sustainable development, which means a balanced and socially acceptable combination of economic growth and preservation of environment for future generations.

PJSC Gazprom's Environmental Policy is a fundamental document of the Environmental Management System (EMS).

In 1995 PJSC Gazprom adopted in-house Environmental Policy and became the first Russian oil and gas company to declare voluntary environmental responsibility.

Revised version of the Company's Environmental Policy approved by the Management Committee in 2015 features current environmental protection, energy efficiency and climate control trends. The Environmental Policy stipulates obligations and instruments for ensuring environmental safety (specifically during development of hydrocarbon fields on the continental shelf and in the Arctic zone of the Russian Federation), and mitigating negative environmental impact risks, including highly vulnerable natural sites and sites of primary protection and preservation concern. Internal staff and external stakeholders, first of all contractors and outside suppliers, are informed on PJSC Gazprom's Environmental Policy provisions.

Since 2011, PJSC Gazprom has adopted a certified EMS designed to implement the Environmental Policy, set and pursue environmental goals, manage PJSC Gazprom's environmental aspects, fulfill assumed obligations, and address risks and opportunities.

Independent audit 2019 acknowledged PJSC Gazprom's EMS conformance to ISO 14001:2015 requirements.

The Gazprom Management Committee is the top governing body in the Environmental Management System.

PJSC Gazprom established the Coordinating Committee for Sustainable Resource Management with intention to advance corporate management system in energy efficiency, environmental protection and sustainable development.

The Committee is primarily responsible for:

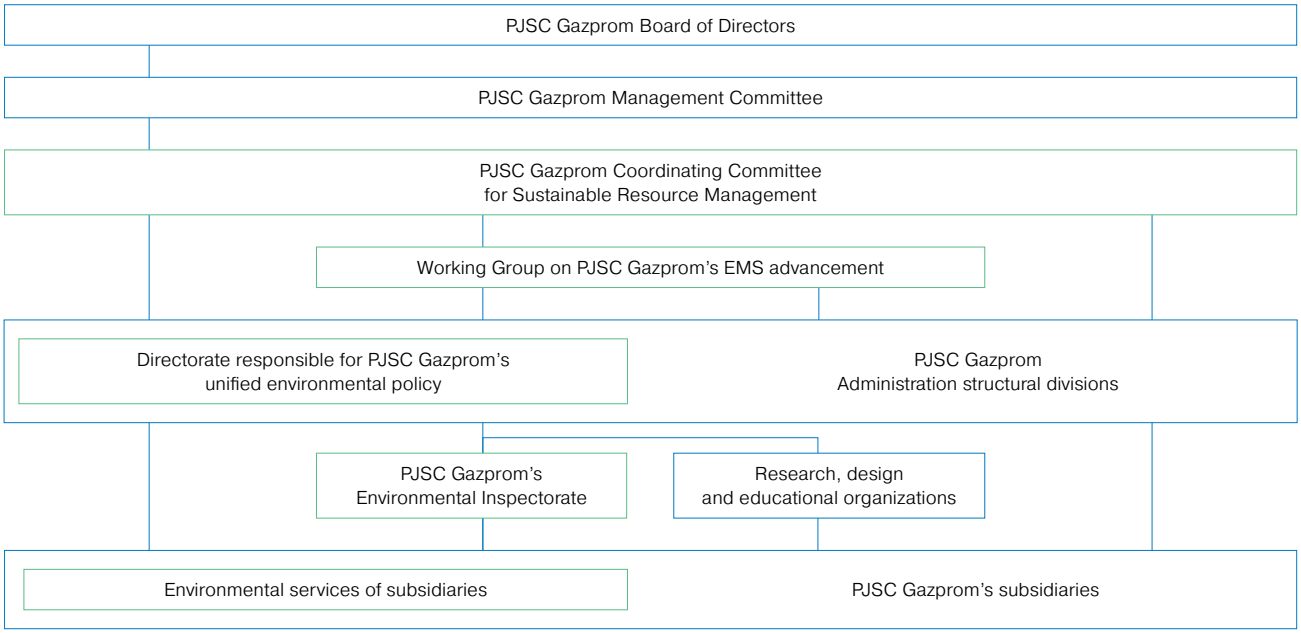
— high environmental and energy performance of PJSC Gazprom business processes, and their compliance with the best global practices;
— introduction of the best available techniques into PJSC Gazprom's business activities to arrange rational use of natural resources and reduction of carbon intensity;
— coordination of activities on constant improvement of PJSC Gazprom's energy and environmental management systems.

The Committee comprises the heads of Administration's structural divisions and subsidiaries of PJSC Gazprom, and is governed by Oleg E. Aksyutin, Deputy Chairman of the Management Committee, Head of the Department.

Teamwork of PJSC Gazprom's subsidiaries and organizations on environmental protection activities, implementation of Coordinating Committee's and PJSC Gazprom's executive resolutions is arranged by the Directorate that is in charge of the unified environmental policy and arrangements aimed at improvement of Gazprom's Group energy efficiency.

A permanent Working Group on PJSC Gazprom's EMS advancement has been established to administer comprehensive approach and coordinate the work of PJSC Gazprom's divisions.

The structure of PJSC Gazprom's Environmental Management System



Scope of PJSC Gazprom's EMS application is specified in the Company's standard STO Gazprom 12-0-022-2017 Environmental Management System. Requirements and application guide. It is applied to management of subsidiaries that perform key activities, including:

- natural gas and gas condensate production (on the continental shelf as well);
- gas and gas condensate processing;
- gas and gas condensate transportation;
- underground gas storage;
- geological exploration;
- well stimulation and repair;
- power and water supply and operation of UGSS power equipment.

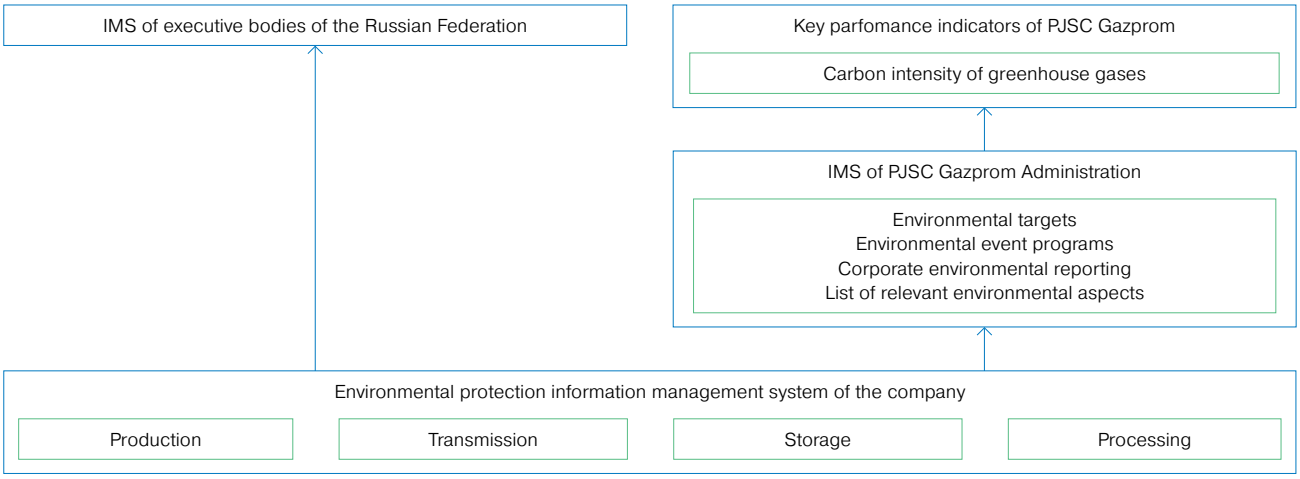
PJSC Gazprom's EMS applies to structural divisions of Administration, 34 subsidiaries with 100% ownership involved in key activities, and PJSC Gazprom's Environmental Inspectorate.

The Gazprom Group companies outside the boundaries of EMS application have successfully adopted and put into operation EMSs, the majority of which is certified for conformance to ISO 14001:2015 requirements. Unique EMS of those companies takes into account specific features of their activities.

The corporate environmental impact assessment and environmental control (audit) are effectively employed at PJSC Gazprom as voluntary environmental responsibility instruments. Environmentally-oriented studies, front-end engineering and design performed by R&D organizations by the order of Gazprom are an integral part of the management system.

For the first time ever in Russia, PJSC Gazprom actualized the single software suit to boost executive decision-making efficiency. The suit comprises the whole sequence of environment protection activities at vertically-integrated company from collection and processing of industry facilities data to preparation of summary report forms submitted to corporate and state systems. The software suit has been developed on the basis of the Russian 1C within the scope of information management system development for all key activities of PJSC Gazprom. In 2019, the Company's information & management system Environmental Management was put into commercial operation in 21 subsidiaries of PJSC Gazprom in charge for production, transmission, underground storage and processing of natural gas. This measure allowed to minimize costs for collection, processing and storage of data, EMS maintenance, to speed up report making and monitor PJSC Gazprom's environmental key performance indicators.

PJSC Gazprom Information & Management System Environmental Management



Environmental training

Continuous advancement of environmental knowledge and corporate culture are prerequisites for strong environmental management.

Since 1995, Gazprom Corporate Institute has been the leading educational establishment for continuous vocational education of PJSC Gazprom's personnel largely contributing into the Company's development. A multi-level corporate training system of the Institute encompasses all groups of personnel from young professionals to top management pool.

In 2019, the Corporate Institute carried out several educational projects to advance environmental education.

Managers and new employees of PJSC Gazprom obtained basic knowledge on the environmental management system and corporate environmental policy during the introductory training.

Managers and experts of environmental services at subsidiaries completed training under the following programs:

- Development and implementation of the environmental management system based on ISO 14001-2015 requirements at gas industry enterprises, internal audit;
- Organizing environmental support for production activities in the oil and gas industry;
- Environmental audit and development of environmental management systems in compliance with the series of ISO 14001 requirements;
- The best available techniques, transition to technological regulation and integrated environmental permits, new requirements and international experience.

The following courses on environmental protection have been delivered to personnel within the scope of professional development programs:

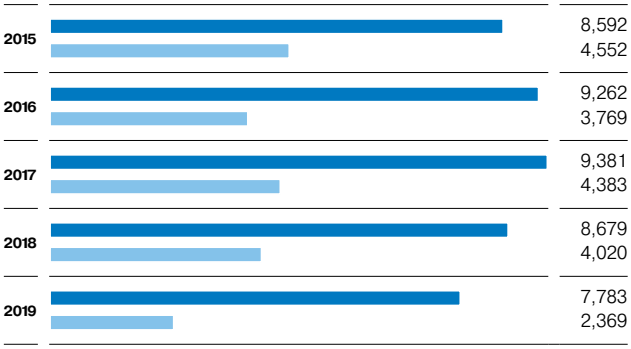
— Basic principles for environmental protection during offshore oil and gas field development under the Offshore Drilling and Operation of Oil and Gas Wells Program;
— Environmental protection for construction project designers under Front-End Engineering and Design under the Capital Structures Program;
— Environmental support of engineering surveys. Engineering and environmental surveys; requirements and procedure for state environmental review under professional training program of PJSC Gazprom's Chief Project Engineer School;
— Environmental review under Projects Review in the Gas Industry professional training program.

Throughout the year a considerable number of Gazprom Group employees have completed the following training courses with the help of online learning technologies:

— Environmental protection in PJSC Gazprom;
— Environmental management in PJSC Gazprom.

In 2019, the Corporate Institute and other educational institutions provided training and skill upgrade for 7,783 employees in subsidiaries (2,369 of them in the EMS), 5,205 in PJSC Gazprom (2,250 of them in the EMS), 1,553 in Gazprom Neft Group (75 of them in the EMS), 295 in Gazprom energoholding.

Environmental training of Gazprom Group personnel, 2015–2019, prs.



43,697 employees completed environmental training in the Gazprom Group in 2015–2019.

Contest of environmental services and ecologists of PJSC Gazprom subsidiaries

OOO Gazprom Dobycha Yamburg (L.A. Solovischuk, head of the department) won the 2019 Contest among environmental services and became The Best Environmental Service following the results of works carried out in 2018.

The following specialists were declared winners of The Best PJSC Gazprom Ecologist Contest:

— A.V. Bendas — the leading engineer of the Transpolar Laboratory of Environmental Control at Engineering & Technical Centre affiliated branch of OOO Gazprom dobycha Yamburg;
— R.A. Gareev — head of the Environmental Protection and Energy Saving Department at OOO Gazprom transgaz Kazan;
— A.V. Dolgov — the leading engineer of the Environmental Protection and Energy Saving Department at OOO Gazprom transgaz Saratov.

Environmental goals and programs

The Gazprom EMS sets environmental goals, develops and implements nature conservation measures on the basis of annually estimated crucial environmental aspects.

The following environmental aspects have been recognized as relevant and crucial for PJSC Gazprom: methane emissions during repair of gas trunklines (GTL), nitrogen oxides emissions during operation of compressor stations (CS), wastewater discharges and waste disposal.

PJSC Gazprom Corporate Environmental Goals for 2017–2019 achieved in 2019, %

№	Corporate environmental goal	Organizations covered by EMS	Progress
1	Reduction of methane emissions into the atmosphere (during repair works of gas transmission system), %	All natural gas transmission subsidiaries	Down 13.1%
2	Reduction of specific emissions of nitrogen oxides into the atmosphere, t/mln m^3	All natural gas transmission subsidiaries	Down 5.0%
3	Reduction of discharge of contaminated and insufficiently treated wastewaters into surface water bodies, %	All subsidiaries	Down 28.2%
4	Reduction of landfill share, %	All subsidiaries	Down 52.9%
5	Reduction of the payment for limit-exceeding environmental impact, %	All subsidiaries	Down 7.5%
6	Reduction of specific fuel and energy consumption for own process needs, kg c.e./mln m^3·km	All natural gas transmission subsidiaries	Down 0.4%

2019 saw achievement of all target values set by PJSC Gazprom Corporate Environmental Goals for 2017–2019 through implementation of measures envisaged by some corporate programs and projects. Information on measures taken that allowed to accomplish corporate environmental goals is given in sections Environmental Impact Indicators and Energy Efficiency Enhancement and Energy Saving.

To promote further mitigation of environmental impact and EMS advancement, in 2019, PJSC Gazprom approved the Corporate Environmental Goals for 2020–2022. Values achieved in 2018 were taken as a benchmark.

PJSC Gazprom corporate environmental goals for 2020-2022

№	Corporate environmental goal	Organizations covered by EMS	Benchmark (2018)
1	Reduction of greenhouse gas emissions during natural gas transmission, t CO_2e / bln m^3·km	All natural gas transmission subsidiaries	55.3
2	Reduction of nitrogen oxides emissions during transmission of natural gas, t/mln m^3	All natural gas transmission subsidiaries	4.23
3	Reduction of limit-exceeding discharge of pollutants into surface water bodies, %	All subsidiaries	5.29
4	Reduction of landfill share from the total share of circulating waste, %	All subsidiaries	38.28
5	Reduction in the share of subsidiaries that surpassed 5% payment for limit-exceeding environmental impact, %	All subsidiaries	35

O.E. Aksyutin, Deputy Chairman of the Gazprom Management Committee, Head of the Department, approved PJSC Gazprom Comprehensive Environmental Program for 2020–2024 to coordinate measures aimed at fulfillment of 2020–2022 corporate environmental targets. The Program represents a system of corporate actions intended to boost efficiency of environmental management, ensure environmental safety, rational use of natural resources and energy saving amid confrontation with increasing environmental challenges and in keeping with the state policy oriented towards innovative environmental development. The Program outlines a set of steps to improve environmental safety of process facilities, including organizational, technological, R&D, design and engineering works.

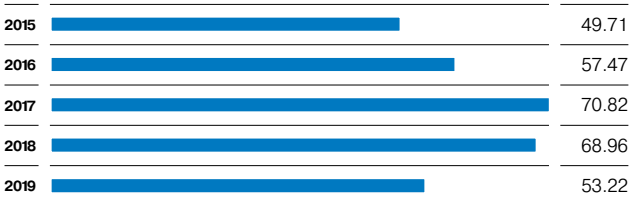
Target values of PJSC Gazprom Comprehensive Environmental Program for 2020–2024

№	Name of the value	UOM	Benchmark (2018)	Target value for 2024	Numerical value
1	Reduction of greenhouse gas emissions during natural gas transmission	t CO_2e/bln m^3·km	55.3	▼ by 3.8%	▼ to 53.2
2	Reduction of nitrogen oxides emissions during natural gas transmission	t/mln m^3	4.23	▼ by 5%	▼ to 4.0
3	Reduction of the share of limit-exceeding discharge of pollutants into surface water bodies from gross water pollutants value	%	5.29	▼ by 1.3%	▼ to 4.0
4	Reduction of landfill share from the total share of circulating waste	%	38.28	▼ by 5.8%	▼ to 32.45
5	Reduction in the share of subsidiaries that surpassed 5% payment for limit-exceeding environmental impact	%	35	▼ by 8.6%	▼ to 26.5

Environmental financing

In 2019, total expenditures of the Gazprom Group for environmental protection in the Russian Federation decreased by 22.8% as compared to 2018 due to reduction of investment expenditures in Gazprom Neft Group and reduction of operational expenditures in OOO Gazprom neftekhim Salavat.

Dynamics of Gazprom Group expenditures for environmental protection, 2015–2019, bln RUB



Fixed capital investments in environmental protection and rational use of natural resources, 2015–2019, mln RUB

	2015	2016	2017	2018	2019
Gazprom Group	15,754.33	22,541.85	35,584.53	29,188.61	20,421.32
Gas business companies	6,931.87	2,542.10	4,450.87	5,612.57	5,732.34
including PJSC Gazprom	6,893.16	2,270.89	2,862.86	5,283.52	5,119.59
Gazprom Neft Group	3,114.05	14,275.03	27,101.67	19,028.63	13,015.56
Gazprom energoholding	2,837.54	368.31	579.20	1,374.55	305.69
Gazprom neftekhim Salavat	2,870.87	5,356.41	3,452.79	3,172.86	1,367.73

PJSC Gazprom investments in 2019 have not significantly changed and have been made under large-scale investment construction projects of PJSC Gazprom, such as Power of Siberia, Nord Stream 2, Ukhta — Torzhok-2, TurkStream.

Gazprom Neft invested over 70% of its funds in atmospheric air protection in the course of Novoportovskoye, Urmanovskoye and Archinskoye fields facilities construction.

Reduction of Gazprom energoholding investments in 2019 was due to completion of treatment facilities construction at Murmansk CHPP and Pravoberezhnaya CHPP (PAO TGK-1), and development of sulphur recovery system at PAO OGK-2 Troitskaya GRES (PAO OGK-2).

In 2015–2019, the Gazprom Group invested RUB 123.5 bln into environmental protection and rational use of natural resources.

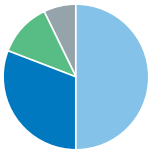
In 2019, investments were made into:

- air protection RUB 10,178.35 mln (50%), of which RUB 9,235.78 mln are investments of Gazprom Neft, including increase of APG use;
- protection and rational use of water resources — RUB 6,440.48 mln (31%), of which RUB 3,194.58 mln for construction of wastewater treatment facilities and circulation water systems;
- protection and rational use of lands — RUB 2,388.32 mln (12%), including land remediation — RUB 1,157.50 mln:
- RUB 1,414.17 mln (7%) were spent to address other environmental issues, including RUB 843.52 mln for waste recycling, treatment and disposal facilities and sites, RUB 98.49 mln
for fishery protection and reproduction, RUB 2.18 mln
for protection and rational use of forests, other — RUB 469.98 mln.

In the reporting year, the Gazprom Group commissioned: 145 wastewater treatment facilities and structures with a total capacity of 26.66 thousand m^3/day; 12 units for entrapment and neutralization of contaminants from off-gases with a capacity of 2,387.05 thousand m^3/hour, one circulation water system with a capacity of 0.39 thousand m^3/day; 10 units for waste neutralization and treatment with a capacity of 93.96 thousand t/year; one site for treatment, neutralization and disposal of toxic process, household and other wastes with a capacity of 0.23 thousand tons per year.

Structure of Gazprom Group investments in environmental protection and rational use of natural resources, 2019, %

Air protection	50
Protection and rational use of lands	31
Protection and rational use of water resources	12
Protection and rational use of forests, fishery protection and reproduction, facilities and sites for waste treatment, neutralization and disposal, and other	7

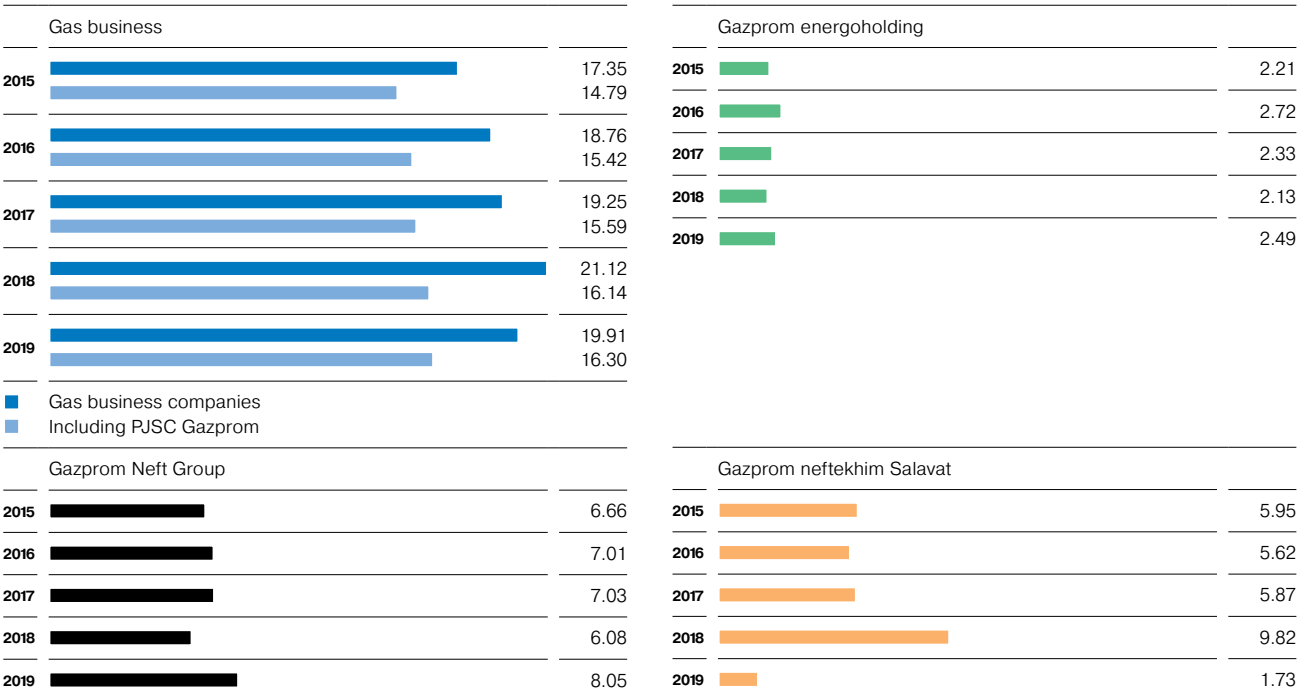


In 2019, current environmental protection expenditures of the Gazprom Group decreased by 18% as compared to 2018. It was due to changes in cost allocation methodology in Gazprom neftekhim Salavat. It did not have any negative impact on actual implementation of environmental protection measures.

Current environmental protection expenditures, 2015–2019, mln RUB

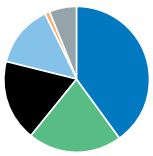
	2015	2016	2017	2018	2019
Gazprom Group	32,169.03	34,103.25	34,467.98	39,154.34	32,180.11
Gas business companies	17,348.59	18,757.29	19,246.65	21,124.78	19,909.65
Including PJSC Gazprom	14,787.92	15,423.62	15,595.46	16,137.67	16,300.29
Gazprom Neft Group	6,656.05	7,005.29	7,027.52	6,080.42	8,053.81
Gazprom energoholding	2,214.70	2,717.38	2,325.85	2,132.36	2,486.13
Gazprom neftekhim Salavat	5,949.69	5,623.29	5,867.97	9,816.77	1,730.52
Including current (operating) expenditures for environmental protection					
Gazprom Group	16,399.90	17,189.74	18,219.75	22,638.04	14,964.57
Gas business companies	8,561.32	9,539.58	10,083.97	10,527.75	10,431.86
Including PJSC Gazprom	8,328.66	9,273.12	9,707.42	10,104.97	9,933.54
Gazprom Neft Group	2,282.08	2,190.53	2,520.95	2,527.70	3,088.78
Gazprom energoholding	413.00	457.90	515.12	613.87	656.20
Gazprom neftekhim Salavat	5,143.50	5,001.73	5,099.71	8,968.72	787.73
Including current expenditures for environmental protection services					
Gazprom Group	12,806.27	14,725.57	14,495.59	14,584.14	15,601.86
Gas business companies	6,591.72	7,735.50	7,854.85	9,226.03	8,530.24
Including PJSC Gazprom	4,284.04	4,690.93	4,592.33	4,662.63	5,420.37
Gazprom Neft Group	4,095.48	4,685.08	4,387.15	3,225.50	4,673.04
Gazprom energoholding	1,729.35	1,843.82	1,683.04	1,378.41	1,606.82
Gazprom neftekhim Salavat	389.72	461.17	570.55	754.20	791.76
Including current expenditures for overhaul repair of basic production assets (environmental protection aspects)					
Gazprom Group	2,962.86	2,187.94	1,752.64	1,932.16	1,613.68
Gas business companies	2,195.54	1,482.21	1,307.83	1,371.01	947.55
Including PJSC Gazprom	2,175.23	1,459.57	1,295.71	1,370.07	946.38
Gazprom Neft Group	278.49	129.68	119.42	327.22	291.99
Gazprom energoholding	72.36	415.66	127.69	140.08	223.11
Gazprom neftekhim Salavat	416.47	160.38	197.70	93.85	151.03

Dynamics of current environmental protection expenditures in the Gazprom Group, 2015–2019, bln RUB



Wastewater collection and treatment costs routinely prevail in the structure of Gazprom Group current expenditures. In 2019, these costs amounted to RUB 13.03 bln. The Gazprom Group spent RUB 6.68 bln on protection and reclamation of lands, surface and ground waters; RUB 4.48 bln on air protection and prevention of climate change; RUB 5.69 bln on waste treatment; RUB 0.35 bln on conservation of biodiversity and protection of natural areas. Expenditures on other environmental protection issues, such as noise, vibration and other physical impacts, radiation safety, research and development activities aimed at mitigation of negative impact on the environment, etc. totaled RUB 1.95 bln.

Structure of Gazprom Group current environmental expenditures, 2019, %



Wastewater collection and treatment	40
Waste management	21
Protection and reclamation of lands, surface and ground waters	18
Atmospheric air protection and prevention of climate change	14
Conservation of biodiversity	1
Other environmental protection measures	6

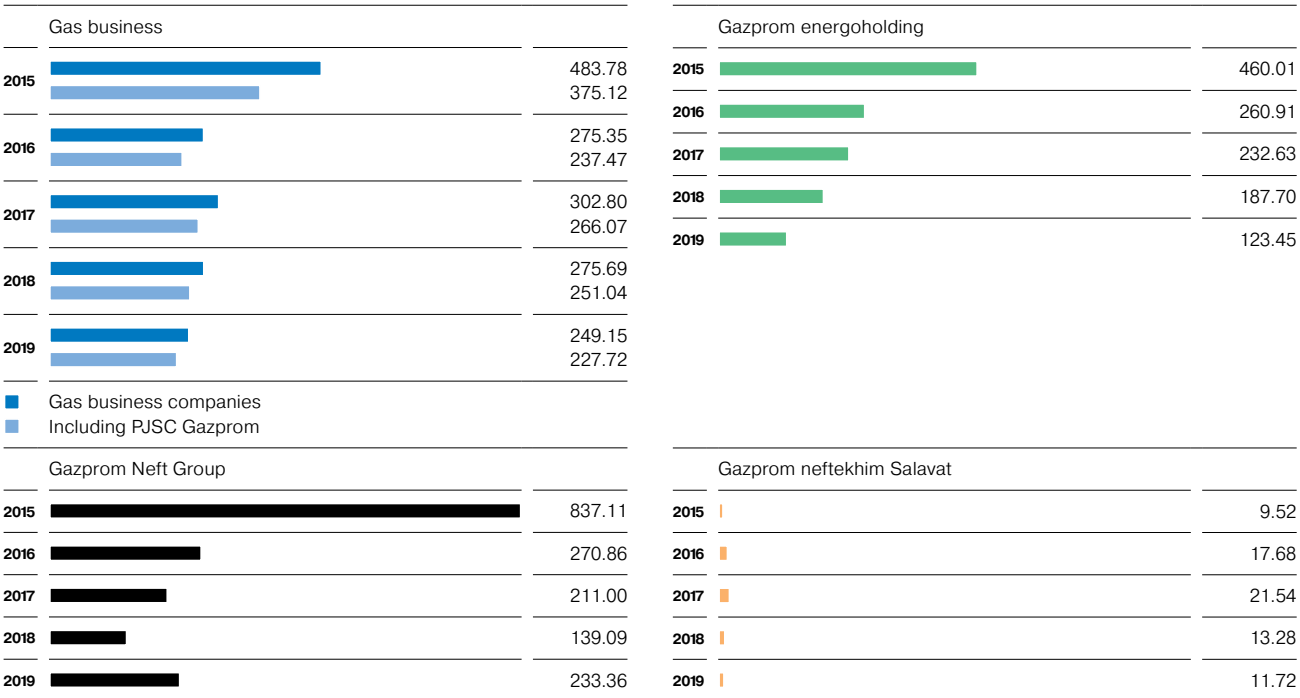
Environmental impact fee

In 2019, the Gazprom Group paid RUB 617.68 mln environmental impact fee to budgets of different levels.

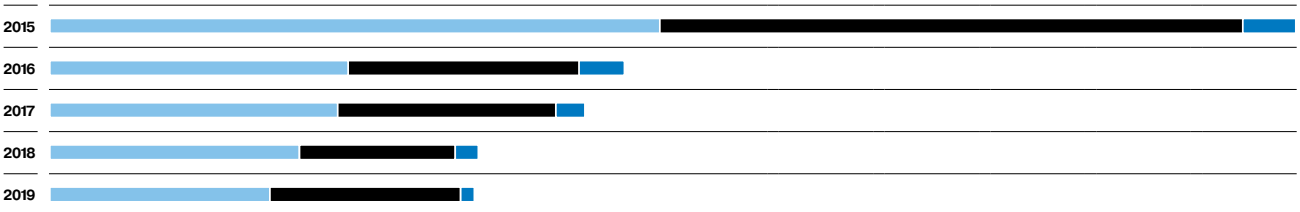
Environmental impact fee, 2015–2019, mln RUB

	2015	2016	2017	2018	2019
Gazprom Group	1,790.42	824.80	767.97	615.76	617.68
Gas business companies	483.78	275.35	302.80	275.69	249.15
Including PJSC Gazprom	375.12	237.47	266.07	251.04	227.72
Gazprom Neft Group	837.11	270.86	211.00	139.09	233.36
Gazprom energoholding	460.01	260.91	232.63	187.70	123.45
Gazprom neftekhim Salavat	9.52	17.68	21.54	13.28	11.72

Environmental impact fee dynamics in the Gazprom Group, 2015–2019, mln RUB



Dynamics of Gazprom Group environmental fees by types of negative impact on the environment, 2015–2019, mln RUB



	2015	2016	2017	2018	2019
Emissions of pollutants into the atmosphere	875.70	427.38	412.39	356.94	318.78
Industrial and consumption waste disposal	840.06	333.70	315.36	223.46	276.41
Discharge of pollutants in water bodies	74.66	63.72	40.23	35.36	22.49

Fees for emission of pollutants into the atmosphere (52%), and for disposal of industrial and consumption waste (45%) prevailed in the structure of environmental impact fees in 2019.

Environmental limit-exceeding impact fee for the Gazprom Group in general amounted to 18%, in PJSC Gazprom — 10%, in Gazprom Neft Group — 32%, Gazprom energoholding — 11%, Gazprom neftekhim Salavat — 3%. Limit-exceeding impact fees in 2019 did not result in excess impact on the environment.

The last years observe a clear trend towards decrease of environmental impact fee that is mainly caused by reduction of payment for pollutant emissions during APG flaring at Gazprom neft fields, elimination of multiplying payment factors in fee calculation and setting off overpayments during advance payments.

2015–2019 period marked three-time drop of the Gazprom Group environmental fee.

Environmental impact indicators

Atmospheric air impact

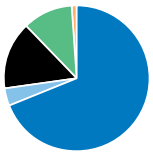
In 2019, gross pollutant emissions from stationary sources of the Gazprom Group totaled 2,862.70 thousand tons, that is slightly lower than in 2018.

Gazprom Group dynamics of gross pollutant emissions, 2015–2019, thousand tons

2015	2,830.57
2016	2,868.46
2017	2,795.97
2018	2,894.02
2019	2,862.70

Share of Gazprom Group companies in gross emissions, 2019, %

PJSC Gazprom	70
Other gas business companies	4
Gazprom energoholding	15
Gazprom Neft Group	10
Gazprom neftekhim Salavat	1

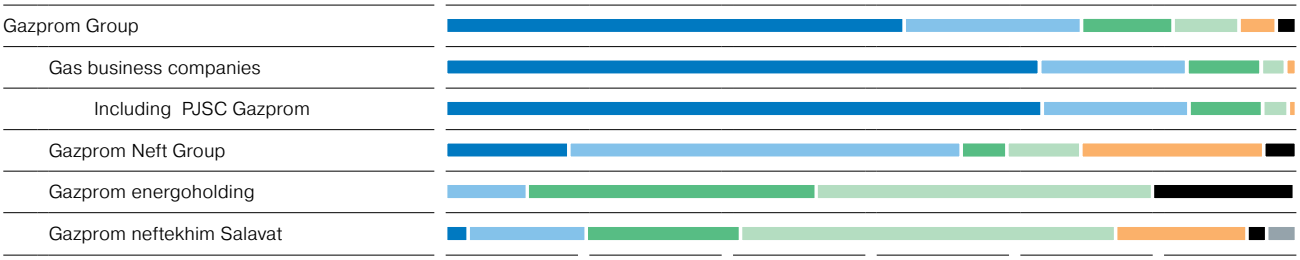


Off-gas decontamination units captured and neutralized 1,473.88 thousand tons of pollutant emissions: 1,351.35 thousand tons at Gazprom energoholding, 112.01 thousand tons at PJSC Gazprom; 10.52 thousand tons at other Group's companies.

Solid particles, predominantly solid fuel ash of power facilities constitute 92% of the total weight of captured and neutralized pollutants, while 8% goes for gaseous and liquid substances (92% of which is sulphur dioxide).

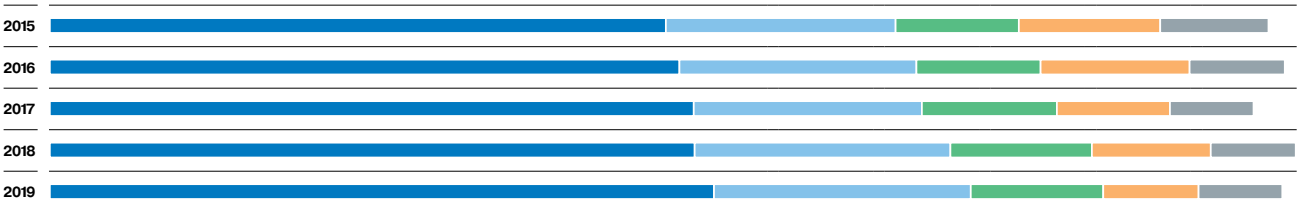
The structure of Gazprom Group emissions is determined by specifics of operating activities of PJSC Gazprom and other gas business companies. Main pollutants in Gazprom's gross emissions comprise hydrocarbons (including methane), carbon oxide, nitrogen oxides, sulphur dioxide. Emissions of solid particles come mostly from the Gazprom energy sector, while volatile organic compounds are commonly associated with Gazprom Neft Group and gas business companies.

Component structure of pollutant emissions in the Gazprom Group, 2019, thousand tons, %



	Gazprom Group	Gas business companies	Including PJSC Gazprom	Gazprom Neft Group	Gazprom energoholding	Gazprom neftekhim Salavat
Hydrocarbons (including methane)	1,542.64	1,478.94	1,400.73	62.59	0.24	0.87
Carbon oxide	596.42	365.70	344.19	199.46	26.67	4.59
Nitrogen oxides	307.71	184.13	172.34	23.18	94.42	5.98
Sulphur dioxide	221.46	59.48	59.29	37.55	109.89	14.54
Volatile organic compounds	124.76	26.40	18.82	92.97	0.30	5.09
Solid particles	67.47	3.78	2.41	16.60	46.33	0.76
Other gaseous and liquid substances	2.24	0.86	0.45	0.23	0.01	1.15

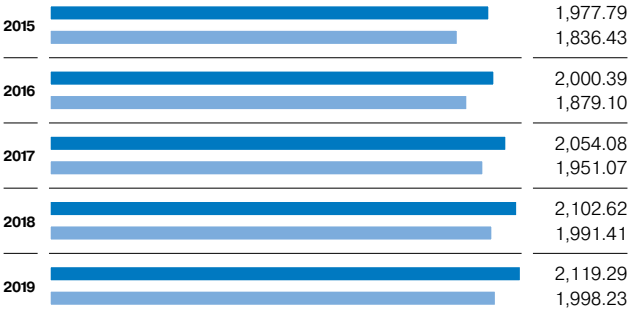
Dynamics of the main pollutant emissions from Gazprom Group stationary sources, 2015–2019, thousand tons



	2015	2016	2017	2018	2019
Hydrocarbons (including methane)	1,430.80	1,462.35	1,495.67	1,497.78	1,542.64
Carbon oxide	533.64	550.48	529.92	594.10	596.42
Nitrogen oxides	286.26	288.46	313.57	328.62	307.71
Sulphur dioxide	328.43	346.09	262.66	276.16	221.46
Other substances	251.42	221.08	194.15	197.36	194.47

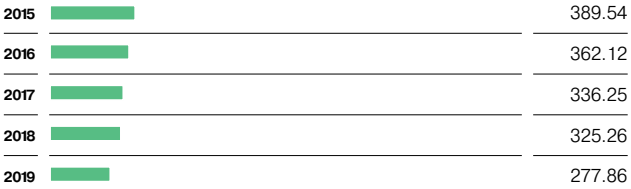
Dynamics of gross emissions in the Gazprom Group, 2015–2019, thousand tons

Gas business companies

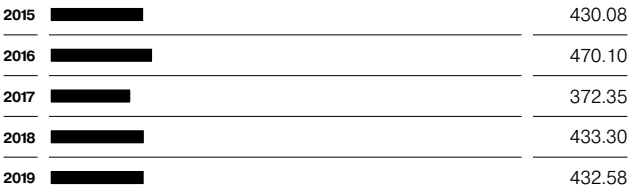


Gas business companies
Includig PJSC Gazprom

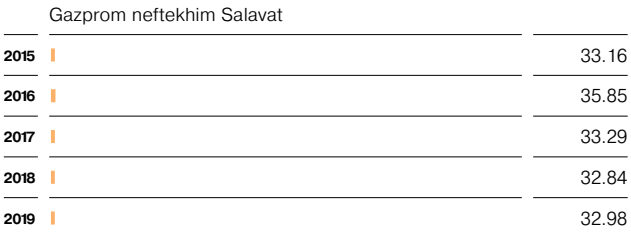
Gazprom energoholding



Gazprom Neft Group



Gazprom neftekhim Salavat



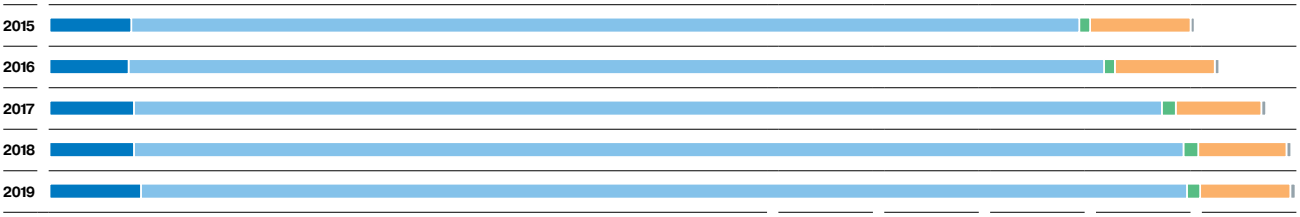
Pollutant emissions from stationary sources of the Group's gas business companies totaled 2,119.29 thousand tons that is 0.8% higher as compared to 2018. PJSC Gazprom's share in the general volume of gas business emissions totaled 94%, and determined the common indicators trend.

PJSC Gazprom's total emissions have slightly increased as compared to 2018 (by 6.82 thousand tons, or by 0.3%). The main reason for that is commissioning of new facilities, and implementation of PJSC Gazprom's energy saving measures that resulted in reduction of gross pollutant emissions at GTL transmission facilities in 2019.

Gross emissions in Gazprom Neft Group and Gazprom neftekhim Salavat have not significantly changed as compared to the last reporting period. Reduction in gross emissions by 15% at Gazprom energoholging is due to fuel balance change with increase of natural gas share.

Every year subsidiary companies of Gazprom hold a large number of environmental campaigns aimed at emissions reduction. Gas transmission companies apply hot tapping, natural gas pumping technologies with the use of mobile compressor units, bypass of gas from pipelines under repair to adjacent sections. Gas producing subsidiaries carry out well logging without releasing natural gas into the atmosphere, introduce the use of multi-component surfactants that improve conditions for removing formation fluid from bottomhole, and thus reduce gas emissions.

Dynamics of gross emissions by the types of PJSC Gazprom* basic activities, 2015–2019, thousand tons



	2015	2016	2017	2018	2019
Production	131.05	126.75	135.30	135.35	146.58
Transmission	1,520.37	1,564.34	1,648.55	1,683.16	1,677.52
Underground gas storage	17.38	20.57	22.34	23.69	21.17
Processing	161.08	160.14	137.18	141.45	144.62
Other types of activities	6.55	7.30	7.70	7.76	8.34

* Pollutant emissions (including methane) at PJSC Gazprom's facilities were calculated in compliance with PJSC Gazprom standardization system documents included in the list of methods used in 2016 for calculation, regulatory actions and monitoring of pollutant emissions approved by AO Scientific Research Institute Atmosphera on the 28th December 2015.

Utilization of associated petroleum gas

Gazprom activities aimed at reduction (stop) of APG flaring play significant role in decreasing emissions of pollutants and greenhouse gases, and efficient use of resources.

Prevention of APG flaring is a burning issue for oil and gas industry in the context of global trends of economy switching to low-carbon and energy efficient development scenario with due account of economic losses and environmental risks. APG investment projects are aimed at achievement of minimum 95% APG used at Gazprom Group fields according to the requirements of the Russian Government Decree No. 1148 as of the 8th of November 2012.

In 2019, APG effective use factor at the fields of PJSC Gazprom's gas producing subsidiaries (including OAO Tomskgazprom) totaled 98.5%, Gazprom Neft Group — 89.0%, Sakhalin Energy — 98.0%.

In 2019, APG effective use factor at PJSC Gazprom totaled 98.5%

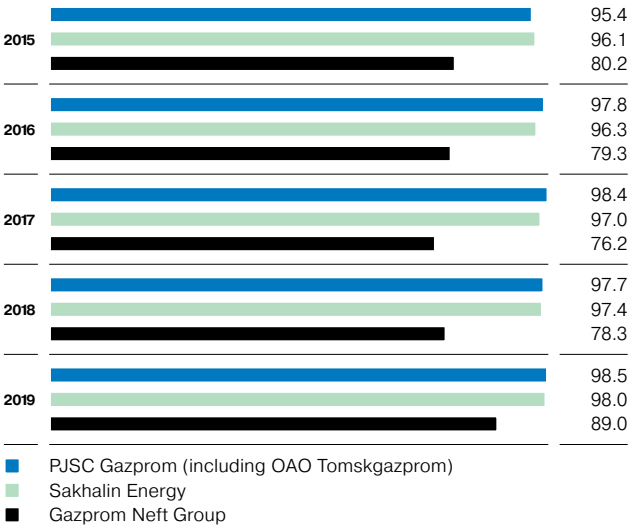
As for Gazprom Neft Group, the actual value for the operated assets in 2019 totaled 89.0%, which is 10.6% higher, than in 2018. The real growth of APG production volumes amounted to 2.242 bln m^3 (+ 15,6%). Growth dynamics for APG effective use can be explained by commissioning of facilities under the Gas Program, as well as organizational and technical measures undertaken at assets with developed gas infrastructure. The most relevant projects that helped to enhance APG effective use are as follows:

— Commissioning of CS with comprehensive gas treatment unit (CGTU) on the Novoportovskoye oil gas condensate field (OGCF) — by 23.3%;
— Commissioning of CS at TL-4 process line with gas-air duct (GAD) in the Eastern area of the Orenburg OGCF — by 6.2%;
— Commissioning of booster compression station (BCS) with GAD on the Urmanskoye field — by 5.0%.

Implemented project portfolio of the Gazprom Neft Group gas program enables the Company to maintain APG effective use uptrend. Competent material and equipment management, launching of new infrastructure facilities are the key growth drivers.

Gazprom Neft Group is oriented to provide required level of APG utilization alongside with bringing new fields into development and increasing the recovery rate of oil and gas. The Board of Directors of Gazprom Neft made resolution to warrant 95% of APG utilization: for assets with developed gas infrastructure in 2020, for Gazprom Neft Group in general with new assets taken into account — in 2022.. Set targets are meant to be achieved through the APG Utilization and Efficiency Program that envisages implementation of investment projects on gas infrastructure construction.

APG utilization dynamics throughout the Gazprom Group companies, 2015–2019, %



Water use

The Gazprom Group companies are committed to mitigate negative water impact by reducing water consumption for production needs and wastewater discharge to surface water bodies.

In 2019, the Gazprom Group companies withdrew 3,921.41 mln m^3 of water for supply purposes, that is 8.4% lower than in 2018.

Sewage disposal in 2019 decreased by 12.5% and totaled 3,389.63 mln m^3.

As compared to 2018, water discharge to surface water bodies decreased by 11.4% and amounted to 3,241.79 mln m^3. Water disposal to irrigation sewage and absorption fields made 7.10 mln m^3, to holding basins — 0.45 mln m^3, to underground horizons — 45.67 mln m^3, 37.92 mln m^3 of which to maintain formation pressure. Disposal to public and other systems totaled 93.52 mln m^3.

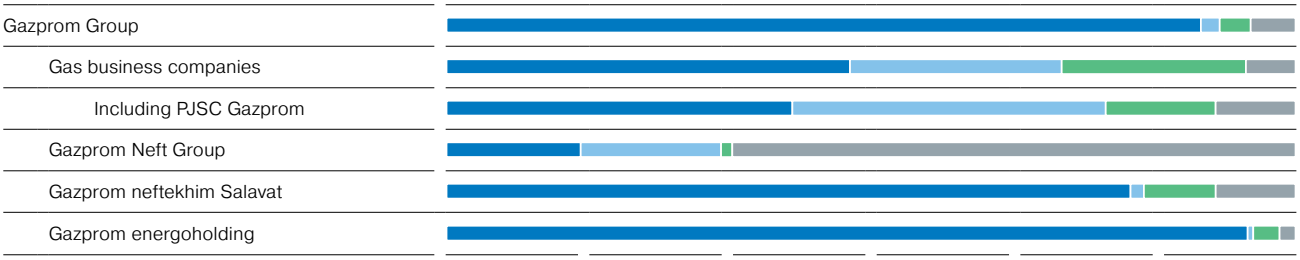
Water recycling systems used 11,409.12 mln m^3.

Water use rates in the Gazprom Group, 2015–2019, mln m^3

	2015	2016	2017	2018	2019
Total water intake	4,511.81	4,538.21	4,523.45	4,280.21	3,921.41
Including water from natural sources	4,290.12	4,301.46	4,283.52	4,065.34	3,571.28
Used for own needs	4,387.64	4,449.27	4,421.11	4,180.89	3,863.11
Including production needs	4,149.04	4,192.10	4,164.84	3,947.36	3,678.12
Water disposal to surface water bodies	3,853.75	3,855.45	3,905.26	3,658.44	3,241.79
Including clean and treated as per standards	3,660.57	3,691.24	3,781.68	3,579.48	3,152.71

In 2015–2019, the Gazprom Group reduced water consumption for production needs by 11%; and water intake from natural sources by 17%.

Gazprom Group water consumption structure by source types, 2019, mln m^3, %



	Gazprom Group	Gas business companies	Including PJSC Gazprom	Gazprom Neft Group	Gazprom neftekhim Salavat	Gazprom energoholding
Surface sources	3,484.33	58.32	27.66	30.75	33.25	3,362.01
Underground sources	86.95	30.60	25.06	32.17	0.65	23.53
Domestic water supply facilities	143.11	26.63	8.79	2.57	3.49	110.42
Other water supply facilities	207.02	7.17	6.39	129.08	3.88	66.89

The share of natural sources in the Gazprom Group's water intake volume comprises 91%: 97.6 per cent is accounted for surface water bodies, and 2.4 per cent - for underground sources. The Gazprom Group's water consumption structure depends on specifics of operation activities and location of facilities.

In 2015–2019, the Gazprom Group discharged 16% less wastewaters to surface water bodies. Clean without treatment and treated as per standards wastewaters accounted for 97.3% in the total volume of the Group's discharge.

Gazprom energoholding covers 91% of the total water consumption, and 97.5% of the total water disposal to surface water bodies. The Gazprom Group's gas business share in overall water consumption volume is not very high, and amounts to 3.1%, including 1.7% of PJSC Gazprom's share.

In 2015–2019, the Gazprom Group reduced wastewater discharge to surface water bodies by 16%.

Disposal to surface water bodies in the Gazprom Group, 2015–2019, mln m³

	2015	2016	2017	2018	2019
Gazprom Group	3,853.75	3,855.45	3,905.26	3,658.44	3,241.79
Gas business companies	34.09	35.10	33.87	31.80	41.83
Including PJSC Gazprom	10.88	11.69	10.74	9.78	18.89
Gazprom Neft Group	27.20	0.11	0.12	0.11	0.09
Gazprom energoholding	3,754.12	3,781.85	3,832.00	3,587.15	3,161.88
Gazprom neftekhim Salavat	38.34	38.39	39.26	39.38	37.99

Dynamics of water disposal to surface water bodies at PJSC Gazprom by types of activities, 2015–2019, mln m³

	2015	2016	2017	2018	2019
PJSC Gazprom	10.88	11.69	10.74	9.78	18.89
Production	0.40	1.61	0.37	0.59	1.35
Transmission	6.63	6.89	6.73	5.53	5.47
Underground gas storage	0.15	0.15	0.14	0.14	0.11
Processing	0.17	0.14	0.10	0.24	0.23
Other activities	3.53	2.89	3.40	3.28	11.73

Increase in wastewater disposal to surface water bodies by PJSC Gazprom companies is mainly associated with discharge of wastewaters in the course of the Kaliningradskoye UGS construction.

The Gazprom Group conducted a large number of environmental campaigns aimed at improvement of water use efficiency for production and household needs, and increasing the treatment level of disposed wastewaters.

In 2019, the Gazprom Group commissioned 145 wastewater treatment facilities with a total capacity of 26.66 thousand m^3/day (70 facilities in Gazprom Neft, 5 in Gazprom energoholding, and 70 in gas business companies). From the total number of treatment facilities commissioned in 2019, 68 units with a capacity of 17.22 thousand m^3/day were put into operation in PJSC Gazprom.

Waste management

In 2019, the Gazprom Group companies generated 3,337.08 thousand tons of waste that is by 6.1% lower, as compared to 2018. The reduction is due substitution of coal with gas in a fuel balance of Gazprom energoholding, which finally resulted in the V hazard class bottom ash waste decrease by 22,1%.

Waste generation dymanics in the Gazprom Group, 2015–2019, thousand tons

2015	4,954.05
2016	4,289.81
2017	4,130.29
2018	3,555.09
2019	3,337.08

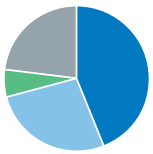
The majority of Gazprom Group waste products (95.3%) is categorized as low hazardous and almost nonhazardous.

In 2015–2019, the Gazprom Group reduced waste generation volume by 32.6%

The main volume of Gazprom Group waste is represented by bottom-ash from Gazprom energoholding (solid coal combustion by-products at heat power plants), drilling waste and oil sludge generated mainly at oil and gas production and refining facilities.

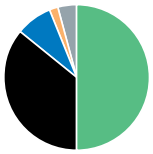
Gazprom Group waste structure by types, 2019, %

Bottom ash waste	44
Drilling waste	27
Oil sludge	6
Other waste types	23



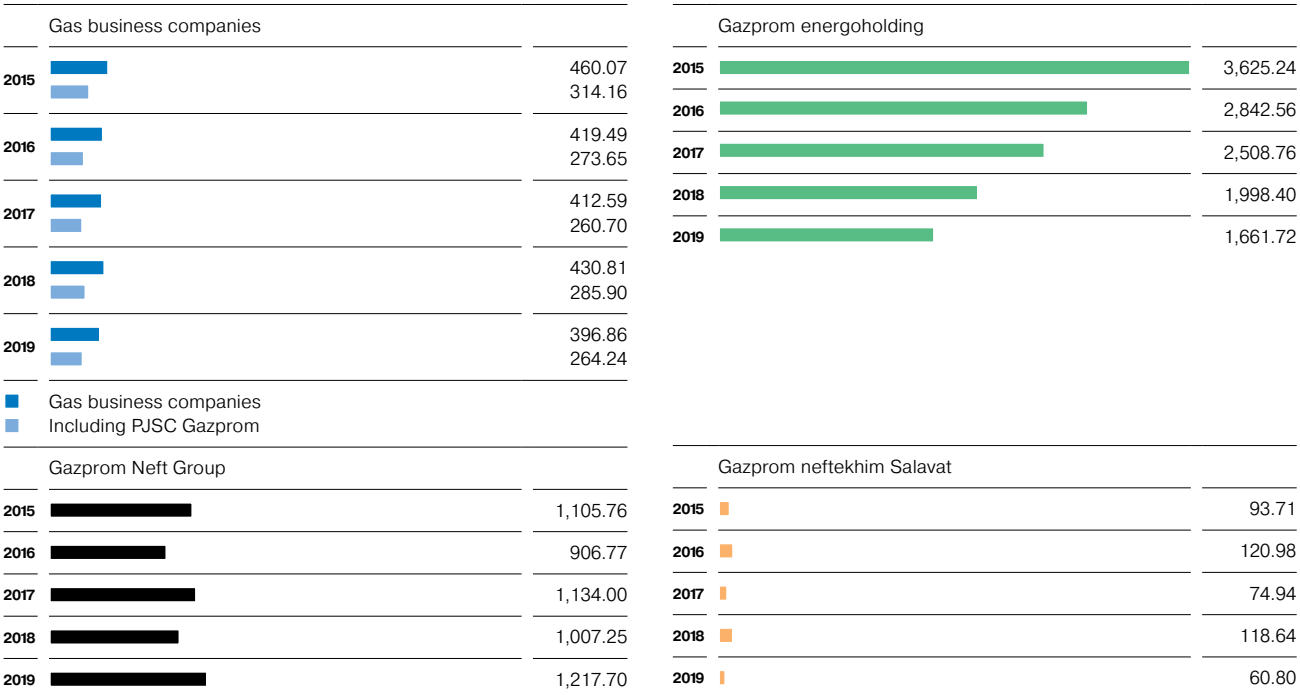
Share of the Gazprom Group companies in waste generation, 2019, %

Gazprom energoholding	50
Gazprom Neft Group	36
PJSC Gazprom	8
Gazprom neftekhim Salavat	2
Other gas business companies	4

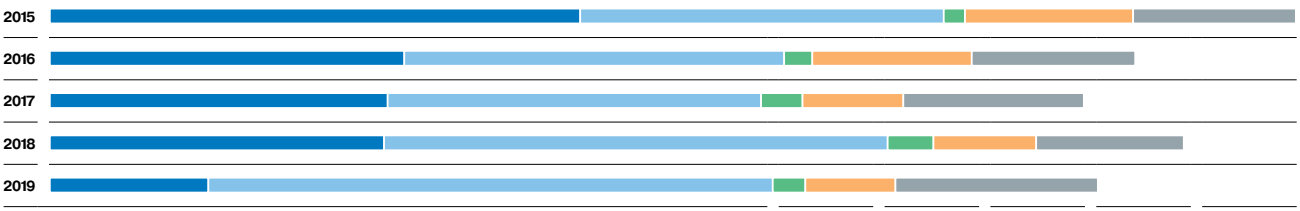


The year 2019 saw launching of 10 waste treatment and recovery facilities in the Gazprom Group with a total capacity of 93.96 thousand tons per year. Nine units were commissioned in Gazprom Neft Group, and one – in PJSC Gazprom (waste thermal treatment facility at OOO Gazprom energo). OAO Tomskgazprom put into operation one site for recovery, treatment and disposal of industrial, household and other wastes with a total capacity of 0.23 thousand tons per year.

Dynamics of waste generation in the Gazprom Group companies, 2015–2019, thousand tons



Waste generation dynamics by PJSC Gazprom's types of activities, 2015–2019, thousand tons



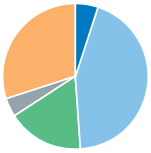
	2015	2016	2017	2018	2019
Production	133.73	89.37	85.18	84.27	39.97
Transmission	91.66	95.78	94.15	126.98	142.30
Underground gas storage	5.36	7.10	10.45	11.54	8.22
Processing	42.40	40.20	25.42	25.91	22.72
Other types of activities	41.01	41.20	45.50	37.20	51.03

As compared to 2018, the volume of wastes generated by PJSC Gazprom in 2019 decreased by 7.6% and totaled 264.24 thousand tons.

PJSC Gazprom gas producing subsidiaries provided the main share in waste decrease (52.6%). This happened specifically due to transition to pitless well drilling, when the waste is not disposed at own waste disposal sites. Moreover, contractors generate and ensure waste management at well construction sites by themselves.

Structure of production and consumption waste management at PJSC Gazprom, 2019, %

Managed, recovered and treated at the company	5
Transferred to third-party organizations for management, recovery and treatment	44
Transferred to third-party organizations for storage and landfilling	17
Disposed at operated landfill sites	4
Waste remaining at the company by the end of the reporting year, including storage sites	30



In 2019, 374 thousand tons of waste were managed by PJSC Gazprom subsidiaries (with account of 23.3 thousand tons available at the beginning of the year, 264.2 thousand tons generated during the year and 86.5 thousand tons that came from other companies).

From that volume, 182.12 thousand tons were managed, recovered and treated by in-house capacities and transferred to third-party organizations for management, recovery and treatment, and 15.81 thousand tons were disposed at operated landfill sites.

The Gazprom Group companies place high emphasis to environmentally friendly management of oil-contaminated waste.

In the reporting year, the volume of oil-contaminated waste has slightly decreased (1.5%) as compared to 2018 and totaled 216.55 thousand tons, 90% of which was in Gazprom Neft Group.

Share of the Gazprom Group companies in oil contaminated waste generation, 2019, %

Gazprom Neft Group	90
Gas business companies	5
Gazprom neftekhim Salavat	3
Gazprom energoholding	2

In 2019, 291.35 thousand tons of oil-contaminated waste were managed by the Gazprom Group (with account of 74.67 thousand tons available at the beginning of the year, 216.55 thousand tons generated during the year, and 0.13 thousand tons that came from other companies). Of that volume 65% was transferred to special organizations for use, treatment and safe disposal.

Structure of oil-contaminated waste management in the Gazprom Group, 2019, %

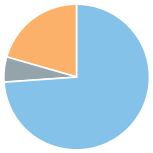
Transferred to other organizations for recovery and treatment	33
Transferred to other organizations for disposal	32
Waste remaining at the company by the end of the reporting year, including storage sites	35

Environmentally safe recovery of drilling waste during well construction and operation is one of the main goals of the Gazprom Group's oil and gas producing companies.

In 2019, 1,065.9 thousand tons of drilling cuttings were subject to waste management (with account of 116.2 thousand tons available at the beginning of the year, 887.9 thousand tons generated during the year, and 61.8 thousand tons that came from other companies). 74% (790.4 thousand tons) of that volume was transferred to special licensed organizations for recovery, treatment and safe disposal.

Structure of drilling waste management in the Gazprom Group, 2019, %

Transferred to other organizations for recovery and treatment	74
Disposed at own landfill sites	5
Waste remaining at the company by the end of the reporting year, including storage sites	21



One of the main requirements for technological process of well construction is negative environmental impact prevention of drilling waste, especially under severe natural and climatic conditions of the Far North. Design solutions that can minimize impact on ecosystems in the process of drilling are being actively adopted. For example, development and use of low-toxic drilling mud formulae and pitless drilling. The practice of drilling waste recovery technologies to produce mineral construction materials for further use in field development is widely introduced.

Land use

Geological exploration, construction, repair works, operation of wells, pipelines and other facilities performed by the Gazprom Group impact vegetation and soil cover.

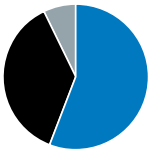
Gazprom pays constant attention to preservation and restoration of disturbed land. Technical and biological reclamation aimed at recovery of productivity and economic value of disturbed land, as well as conservation of landscape are carried out. The Gazprom Group performs comprehensive measures to improve reliability of pipeline systems that have a positive effect on preservation of natural environment components.

Indicators of land protection activities of the Gazprom Group, 2015–2019, ha

	2015	2016	2017	2018	2019
Disturbed lands per year	58,054.53	27,027.45	42,162.29	25,786.97	22,885.37
Including contaminated areas	82.30	71.31	87.33	111.26	73.16
Disturbed land reclaimed per year	18,220.34	42,450.24	19,600.05	15,767.52	17,670.50
Including contaminated areas	187.37	94.08	89.10	96.13	65.69

Share of the Gazprom Group companies in disturbed lands indices during the year, 2019, %

PJSC Gazprom	56
Gazprom Neft Group	37
Other companies of the Group	7



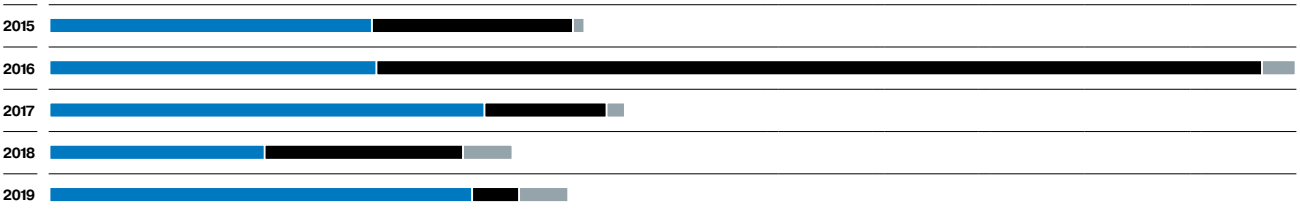
During the reporting year, the Gazprom Group Companies disturbed 22.89 thousand ha of land, which is 11% lower than in the previous year, of which PJSC Gazprom takes the share of 12.72 thousand ha, Gazprom Neft Group — 8.46 thousand ha, and other Group's companies — 1.71 thousand ha. Disturbed land area reduction in 2019 is mainly associated with completion of some construction works at PJSC Gazprom's facilities. Disturbed land area increase in Gazprom Neft is due to assignment of land plots for Gazpromneft-Yamal field development, and construction of Gazpromneft-Orenburg and Gazpromneft-Vostok well pads.

Impact on land resources is not a relevant environmental aspect for Gazprom, as reclamation is being performed as needed and on schedule. The majority of subsidiaries ensure a full-scale remediation of disturbed land during the year.

Lands, where works have been totally completed, and which were disturbed or contaminated during the previous years, were reclaimed. The reporting year saw reclamation of 17.7 thousand ha of land, including 14.4 thousand ha reclaimed by PJSC Gazprom, 1.6 thousand ha reclaimed by Gazprom Neft Group, and 1.7 thousand ha reclaimed by other Group companies.

12% increase in the volume of lands reclaimed in 2019 is due to completion of repair and construction works on lands leased during the previous periods, including construction of facilities under the Power of Siberia gas trunkline project.

Dynamics of disturbed land reclamation in the Gazprom Group companies, 2015–2019, thousand ha



	2015	2016	2017	2018	2019
PJSC Gazprom	10.98	11.14	14.82	7.33	14.40
Gazprom Neft Group	6.85	30.17	4.16	6.76	1.60
Other companies of the Group	0.39	1.14	0.62	1.68	1.67

Necessary land quality restoration measures have been undertaken by Gazprom Neft Group on the area of 65.69 ha contaminated during the year.

Applied reclamation methods are aimed to prevent negative erosion processes development, stabilize landscapes and restore soil and vegetation cover. Technologies use accessible including secondary materials (for example, treated drilling waste), geotextile, plant growth stimulants. Specially selected strains of soil microorganisms allow strengthening of topsoil, including embankment slopes, fastening and intensifying root formation and growth of plants.

The Gazprom Group companies take every precaution to prevent pollutant penetration into the soil, surface and ground waters, avoid erosion and other types of soil degradation. Environmental regulation compliance audit of reclaimed soils (including soil, geobotanical, agrochemical and other studies) is done within environmental monitoring and control programs during construction and reconstruction of Gazprom Group facilities.

Prevention of accidents

Every year, the Gazprom Group companies take measures to prevent accidents to increase equipment reliability and mitigate accident risk at the operated facilities of the Gazprom Group. They comprise technical diagnostics of pipelines on fields, injection of corrosion inhibitors; timely repair and maintenance works; flood and erosion protection measures; regular inspection of plugged and abandoned wells; regular inspection of linear sections of GTL and Offshoot pipelines to detect cracks and gas leaks, including the use of laser radars; supply of necessary equipment and hydrocarbon spill response tools.

In 2019, there were 6 environmental accidents at the Gazprom Group companies at GTL transmission and processing facilities: in OOO Gazprom transgaz Yugorsk — two accidents, in OOO Gazprom transgaz Chaikovsky, OOO Gazprom transgaz Moskva, OOO Gazprom pererabotka, OOO Gazprom neftekhim Salavat — each with one accident. Propagation of stress corrosion cracks was the main reason of accidents at operated facilities.

Accidents culminated in 21.4 mln m^3 natural gas losses in the Gazprom Group that is equivalent to RUB 11.2 mln in environmental damages.

The reporting year evidenced 756 ruptures of oil pipelines that is 17.6% less than in 2018. The volume of oil and petroleum products spilled due to pipeline ruptures amounted to 128.5 tons. Gazprom Neft Group made the main contribution into the volume of spilled oil and petroleum products — 128 tons. Pipeline ruptures in Gazprom Neft Group occurred on the linear section of infield pipelines. Internal corrosion defects caused by transmission of corrosive media are the main reason for ruptures on oil and gas fields. The number of pipeline ruptures in Gazprom Neft Group was decreased by implementing the Clean Territory investment program that comprised measures to assess, monitor, forecast and extend service life of pipeline systems, and also thanks to advance replacement of pipeline sections according to inspection results.

Environmental accidents were not registered at facilities of other Gazprom Group companies.

International activities

Republic of Armenia

ZAO Gazprom Armenia is a 100% subsidiary of PJSC Gazprom engaged in transportation, storage, processing, distribution and selling of natural gas, electrical power generation and trade in the Republic of Armenia.

In 2019, gross pollutant emissions totaled 62.36 thousand tons, i.e. 10.2% lower than in the previous year. Reduction of gross emissions is due to environmental measures aimed at improving reliability and safety of process facilities. Greenhouse gas emissions (GHG) from gas business and power facilities decreased and amounted to 1.96 mln tons of CO_2-equivalent that is 20.3% lower than in 2018. This was due to decrease in the volume of fugitive emissions caused by reduced natural gas injection and extraction at the CS of the Abovyan underground gas storage facility and reduced generation of electrical energy at the Razdan-5 facility.

Water disposal into surface water bodies in 2019 amounted to 140.00 thousand m^3. 100% of this volume are effluents treated to standard quality.

During the year, 0.125 thousand tons of waste was produced, 94.6% of which belongs to hazard class IV.

Environmental fee decrease in 2019 by 14% is a result of mitigation of pollutant emissions from electric power generation at the Razdan-5 heat and power plant.

State environmental control bodies did not inspect during the reporting year.

ZAO Gazprom Armenia basic environmental indicators, 2015–2019

Indicators	2015	2016	2017	2018	2019
Gross emissions, thousand tons	80.07	83.80	88.61	69.48	62.36
GHG emissions, mln tons CO_2e*	–	2.44	2.61	2.46	1.96
Water discharge into surface water bodies, thousand m^3	105.00	122.00	115.00	146.00	140.00
Including clean and treated as per standards	105.00	122.00	115.00	146.00	140.00
Produced waste, thousand tons	0.36	0.19	0.12	0.12	0.12
Disturbed land by the end of the year, ha	0.00	0.00	0.00	0.00	0.00
Environmental fee, thousand RUB	360.27	449.85	592.42	1,109.56	953.74
Share of payments within established rates in the total payment amount, %	100	99.99	100	100	100

* GHG emissions were calculated in compliance with the Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities engaging in Business and other Activities in the Russian Federation approved by the Ministry of Natural Resources and Environment of the Russian Federation as of 30 June 2015 No. 300.

Republic of Belarus

OAO Gazprom transgaz Belarus is a 100% subsidiary of PJSC Gazprom that is engaged in transmission and underground storage of natural gas in the Republic of Belarus. The company is included in PJSC Gazprom EMS application scope.

Gross pollutant emissions amounted to 22.11 thousand tons that is 4.6% lower than in 2018. This fact is associated with goods transport moderation and reduction of gas injection and extraction from underground storages. Total emissions volume did not violate set limits.

Disposal of wastewaters into surface water bodies amounted to 125.43 thousand m^3 that is 4.8% lower as compared to 2018. All effluents by 100% pertain to the category treated as per standards.

During the year, OAO Gazprom transgaz Belarus generated 5.61 thousand tons of waste that is 14% higher than in 2018. This is due to increase in the volume of drilling operations in the reporting period, and corresponding growth in drilling waste.

Environmental fee within the scope of set limits totaled RUB 21.32 mln, which is 6% less than in 2018. There were no limit-exceeding impacts. Reduction of environmental fee (as compared to 2018) is associated with mitigation of pollutant emissions.

Measures carried out under the scope of OAO Gazprom transgaz Belarus Energy-saving Program prevented emission of 11.8 thousand tons of methane during repair of the linear part of gas trunklines.

OAO Gazprom transgaz Belarus basic environmental indicators, 2015–2019

Indicators	2015	2016	2017	2018	2019
Gross emissions, thousand tons	24.85	23.78	26.98	23.17	22.11
GHG emissions, mln tons CO_2e*	0.32	0.30	0.38	0.32	0.32
Water discharge into surface water bodies, thousand m^3	167.42	97.48	142.94	131.69	125.43
Including clean and treated as per standards	167.42	97.48	142.94	131.69	125.43
Produced waste, thousand tons	5.00	4.13	5.96	4.92	5.61
Disturbed land by the end of the year, ha	14	0	0	0	0.87
Environmental fee, thousand RUB	25,600.88	22,116.42	24,608.43	22,664.04	21,315.97
Share of payments within established rates in the total payment amount, %	100	100	100	100	100

* GREENHOUSE GAS emissions were calculated in compliance with requirements of the Technical Code of Common Practice "Environmental protection and management of natural resources. Climate. Emissions and absorption of greenhouse gases. Rules for emissions calculation by means of energy-saving measures, renewable energy sources" approved by Decree of the Ministry of Natural Resources and Environmental Protection of the Republic of Belarus as of 5 September 2011 No. 13-T On approval and enforcement of technical statutory and regulatory enactments and making amendments in technical statutory and regulatory enactment.

In 2019, regulatory bodies of the Republic of Belarus made one inspection at OAO Gazprom transgaz Belarus facilities, which revealed two violations that were corrected within the time limits set and without penalties.

In December 2019, certification body (Republican Unitary Enterprise Belorussian State Institute of Metrology) performed compliance audit in the company. The audit confirmed OAO Gazprom transgaz Belarus EMS conformance to requirements of STB ISO 14001-2017 state standard of the Republic of Belarus.

Kyrgyz Republic

OsOO Gazprom Kyrgyzstan is a 100% owned subsidiary of PJSC Gazprom engaged in natural gas transmission, storage, distribution and trade in the Kyrgyz Republic.

In 2019, gross pollutant emissions decreased by 23% and comprised 2.93 thousand tons, greenhouse gas emissions — 0.07 mln tons of CO_2-equivalent.

The volume of generated waste escalated to 1.78 thousand tons due to repair works and commissioning of new administrative buildings.

The reporting year saw 2.5 times increase in disturbed land, as compared to 2018 (180 ha). This is because of construction works at GTL branch Bishkek-Kant-Tokmok and GDS Tokmok. All disturbed land during the year were reclaimed.

Environmental fee stayed within set standards and totaled RUB 93.3 thousands.

In 2019, state environmental regulatory bodies of the Kyrgyz Republic did not make inspections at OsOO Gazprom Kyrgyzstan facilities, no penalties were imposed.

OsOO Gazprom Kyrgyzstan basic environmental indicators, 2015–2019

Indicators	2015	2016	2017	2018	2019
Gross emissions, thousand tons	1.88	13.52*	1.49	3.82	2.93
GHG emissions, mln tons CO_2e **	—	0.33,	0.04	0.09	0.07
Water discharge into surface water bodies, thousand m^3	0	0	0	0	0
Including clean and treated as per standards	0	0	0	0	0
Produced waste, thousand tons	0.16	0.14	0.16	0.18	1.78
Disturbed land by the end of the year, ha	0	0	0	0	0
Environmental fee, thousand RUB	166.95	61.75	63.84	66.5	93.3
Share of payments within established rates in the total payment amount, %	100	100	100	100	100

* With account of process losses of natural gas.

** GHG emissions were calculated in compliance with the Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities engaging in Business and other Activities in the Russian Federation approved by the Ministry of Natural Resources and Environment of the Russian Federation as of 30 June 2015 No. 300.

Non-CIS countries

Gazprom EP International B.V. is PJSC Gazprom single operator of international projects on hydrocarbon fields prospecting, exploration and development. Recognizing its high responsibility towards partners and communities in the countries of operation, Gazprom EP International B.V. strives for preserving environment in every possible way by following the highest environmental standards and introducing technological and scientific innovations aimed at environmental impact mitigation.

Currently the company is operating in twenty countries across four continents facilitating economic growth and strengthening energy potential of its partners by rendering high-quality services: geological exploration, drilling, pipeline and CS construction, etc.

Developed environmental management system functions at Gazprom EP International B.V. and complies with requirements of ISO 14001:2015. The 9 of December 2019 saw the solemn award of certificates to Gazprom EP International B.V. by Lloyds Register Commercial Director for North Europe.

ISO compliance certification became an achievement of three-year preliminary work and confirmed efforts invested by the company into sustainable development and constant perfection acknowledged by independent experts.

Preventing negative impact on the environment

Environmental assessment of projects

In compliance with requirements of the Russian and international legislation, the Gazprom Group companies perform environmental impact assessment of planned business operations at all investment project life-cycle stages from investment idea to construction projects.

Since 1994, PJSC Gazprom has been carrying out corporate expert review of design documents on a proactive basis before submitting them to state expert review and environmental review.

Corporate expert review comprises comprehensive assessment of documentation conformance to requirements of the Russian Federation legislation, international norms and rules, PJSC Gazprom's guidelines and regulations on environmental protection, energy-saving and enhancement of energy efficiency.

Corporate expert review is aimed at improvement of documentation quality related to making timely nature protection and energy efficient decisions to address environmental risk mitigation in the course of project implementation.

In 2019, corporate environmental expert review examined 394 sets of preliminary design and project documentation on development, construction, reconstruction, upgrading and technical re-equipment facilities.

Preliminary design and project documentation of the following large process facilities was reviewed:

- Expansion of UGSS to ensure gas feeding into the South Stream gas pipeline. 2nd stage (eastern corridor) in the volume of up to 63 bln m^3/year. Stage 2.4 the Korenovskaya CS (phase 3, 4), the Kazachya CS (phase 3, 4), the Russkaya CS (phase 3, 4);
- Expansion of UGSS to ensure gas feeding into the South Stream gas pipeline. Stage 2.1. Linear section. Section Pochinki–Anapa, km 0–km 181, km 181–km 295.7, km 295.7–km 347.5;
- Expansion of UGSS to ensure gas feeding into the South Stream gas pipeline. Stage 2.2. Linear section. Section Pochinki–Anapa, km 963.7–km 1168.1 (km 963.7–km 978, km 978–km 1168.1);
- The Power of Siberia gas pipeline. Stages 2.1. – 2.8. Section Lensk-Belogorsk (8 sections), Stage 5.1. Compressor station CS 1 Saldykelskaya, Stage 5.5. Compressor station CS 5 Nagornaya, Stage 5.7. Compressor station CS 7 Sivakinskaya, Stage 5.4 Compressor station CS 4 Nimnyrskaya;
- The Power of Siberia gas pipeline. Section Kovykta-Chayanda;
- Development of the Chayandinskoye OGCF. Stage 2.1, 2.2, 2;
- Development of the Kovyktinskoye gas condensate field. Stage 2. Drill sites and access roads in the area of CGTU-3 (8 well pads);
- Development of the Kshukskoye and Nizhne-Kvakchikskoye gas condensate fields. Hookup of additional wells at the Kshukskoye field №№ 4P, 5P, 6P;
- The Amur gas processing plant;
- Investment feasibility study for the Novourengoysky gas chemical facility upgrading project;
- Booster compressor station at CGTU-3S of the Zapolyarnoye OGCF (phase 2). Stage 1. Reconstruction of solid household waste facility at the Zapolyarnoye OGCF.

Environmental risk insurance

Environmental insurance provides risk coverage for damage to the environment, life, health and property of third parties in the course of onshore and offshore exploration, drilling, production, transportation, processing, and storage of hydrocarbons, operation of hazardous facilities, construction and other related operations, including those performed on the Arctic shelf.

In 2019, PJSC Gazprom and AO SOGAZ resigned contract on liability insurance for damage to the environment (environmental risks), life, health and property of third parties in respect to PJSC Gazprom's activities. Extent and conditions of insurance coverage remained unchanged.

Insurance coverage territory is the Russian Federation and continental shelf of the Russian Federation.

Insurance contract is voluntary and complements compulsory civil liability insurance contracts of the hazardous facility owner (according to the Federal law No. 225-FZ On Compulsory Insurance of Civil Liability of the Owner of a Hazardous Object for Inflicting Damage as a Result of an Accident at the Hazardous Object as of 27 July 2010). Voluntary insurance covers liability that is not insured by compulsory civil liability contracts for damage caused by accident at a hazardous facility, as well as liability for damage that goes beyond liability limits under compulsory insurance contracts, and/or if liability limit under compulsory insurance contract is over.

AO SOGAZ payments in the reporting year amounted to RUB 243.38 mln, including RUB 224.39 mln for damage of the previous years.

Operational environmental control and monitoring

Operational environmental control (OEC) is organized in all Gazprom Group companies and is aimed at fulfillment of environmental protection legislation, compliance with specified environmental standards, rational use of natural resources and mitigation of environmental impact.

Environmental control is a crucial legal step intended to ensure rational use of natural resources and environmental protection from harmful impact. It is implemented at all stages of business activities of PJSC Gazprom subsidiaries, organizations and contractors.

Moreover, PJSC Gazprom has an effective Environmental Inspection that not only controls compliance of subsidiaries and contractors with requirements of environmental protection legislation and corporate environmental rules, but also carries out internal EMS audits of PJSC Gazprom subsidiaries.

PJSC Gazprom is the only Russian oil and gas company with its own Environmental Inspection Service.

In 2019, PJSC Gazprom Environmental Inspection conducted 424 environmental legislation compliance verifications.

Environmental Inspection carried out 197 scheduled checks in 48 Gazprom's production subsidiaries and organizations, including 168 EMS audits. Specialists of PJSC Gazprom Environmental Inspection Service checked 10 gas producing companies, 18 gas transmission companies (including OAO Gazprom transgaz Belarus), 7 branch offices of OOO Gazprom UGS, 3 natural gas processing plants, 8 branch offices of OOO Gazprom energo, and ZAO Gazprom Armenia, OsOO Gazprom Kyrgyzstan, OOO Gazprom geologorazvedka, and other organizations. The audit plan was 100% fulfilled.

OOO Gazprom gazomotornoe toplivo passed 38 inspections aimed at checking how OEC is organized and implemented at its facilities.

At construction and reconstruction facilities, as well as at the facilities of customers and general contractors operation activities, such as OOO Gazprom invest, OOO Gazprom sotsinvest, Gazprom tsentrremont, OOO Stroygazmontazh, AO StroyTransNefteGaz and other, 50 environmental legislation compliance verifications have been performed.

In 2019, PJSC Gazprom Environmental Inspection accomplished 15 technical audits of PAO Gazprom Neft subsidiaries and OAO Vostokgazprom.

Furthermore, 124 checks have been performed in 9 gas producing and 17 gas transmission subsidiaries of PJSC Gazprom to control how the companies organize and implement OEC in compliance with Article 67 of the Federal Law No7-FZ On environmental protection as of the 10 January 2002.

The management teams of the checked companies were informed on the results of inspection along with recommendations on improving environmental activities, corrective actions and prevention of violations. Remedy non-compliance factor (within the prescribed time limit) totaled 98%.

The system of Operational Environmental Monitoring (OEM) of PJSC Gazprom is equipped with cutting edge technologies and is constantly advancing.

Sticking to precautionary principle, Gazprom makes every effort to provide maximum possible mitigation of process impact on the environment, especially where it is essential to preserve endangered and vanishing species of plants and animals, unique natural sites and ecosystems.

The stage of investment project development envisages environmental impact assessment to identify vulnerable ecosystems, and solutions to prevent ecological disturbance in the course of facilities construction and operation. Operational environmental monitoring of environmental parameters, including the state of flora and fauna is carried out. Compensation measures aimed at preservation of natural ecosystems and fish replacement are undertaken.

Gazprom has developed and successfully operates the OEM system that comprises stationary and mobile ecolaboratories, meteorological and hydrological stations, automated control stations, and observation wells. This enables to monitor atmospheric pollutant emissions from controlled emission sources; quality of atmospheric air in populated areas and at the border of sanitary protection zones; noise impact; radiation background; quality of surface and ground waters, bottom sediments; quality of utility and drinking water supply sources; state of geological environment, soil and snow cover; solid waste and waste waters. The system monitors environmental parameters, analyzes obtained results and develops measures to minimize negative impact on the environment. Annually with the help of certified laboratories, subsidiaries make millions of tests to determine concentration of hazardous substances in industrial wastes of companies, drinking waters, waste waters, surface waters and soils. The test results guide investigations that form data package on the nature, number and scale of the company's environmental impact. A set of company's environmental management measures is developed in accordance with the obtained information.

Monitoring surveys and observation programs are developed and agreed with the state regulatory bodies on an annual basis to organize and implement OEM.

The created OEM system provides quick acquisition of valid data on environmental conditions of the company's facilities and in their impact zone, timely engineering analysis of the current ecological situation in the process of industrial and business operations, planning of environmental protection measures, control of their implementation and making effective environment protection decisions.

In some cases, Gazprom Group's OEM is integrated into regional systems of environmental monitoring.

In 2019, OOO Gazpromneft-Orenburg put into service 9 stationary environmental monitoring stations that provide air monitoring in populated areas located close to east of the Orenburg OGCF. Each station measures concentration of nitrogen oxides and dioxides, hydrogen sulphide, sulphur dioxide and hydrocarbons in air on a 24-hour basis. Data from mobile laboratories and eco-control stations are automatically transmitted online to the unified air monitoring service of the company.

The OEM carried out in August 2019 confirmed compliance of the Amur gas processing plant construction to the Russian and international environmental standards. Specialists of Federal State Budgetary Institution Centre of Laboratory Analysis and Technical Measurements in the Far Eastern Federal District performed monitoring and took atmospheric air samples from 6 observation points. Experts determined concentration of dust and suspended particles, carbon oxides and nitrogen, nitrogen dioxides and sulphur, hydrocarbons, benzapyrene and hydrogen sulphide. Tests did not reveal atmospheric air pollution and excess of maximum permissible concentrations in samples. Environmental monitoring at the construction site of the Amur gas processing plant and at the border with the nearest apartment blocks is carried out on a permanent basis.

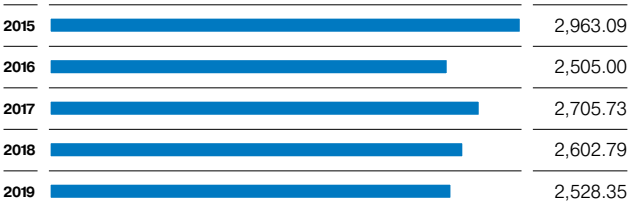
OOO Gazprom energoholding (PAO MOEK, PAO Mosenergo) has automated emissions monitoring system in service. Control devices that monitor emissions form 42 boilers are both the part of process control systems at stations, and Moscow eco-monitoring system. Information on pollutant emissions (nitrogen oxides and carbon oxide) has been transmitted to State Environmental Budgetary Institution Mosecomonitoring throughout 2019.

PAO MOEK has automated emissions control devices installed at 24 facilities (20 — PAO MOEK and 4 — PAO TSK Mosenergo). Information about emissions is used to regulate the heat generation process.

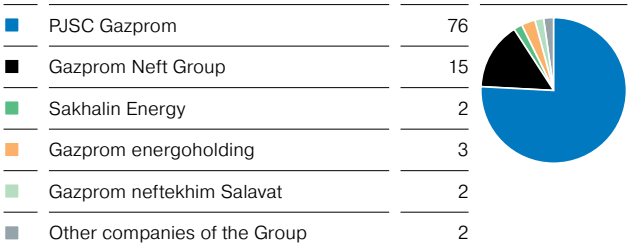
In case operating activities are performed in specially protected natural areas or special ecological status territories, the Gazpom Group includes monitoring of their condition in OEM programs.

In 2015–2019, the Gazprom Group spent RUB 13.3 bln on operational environmental monitoring and control.

Gazprom Group expenditures on operational environmental monitoring and control, 2015–2019, mln RUB



Structure of operational environmental monitoring and control expenditures in the Gazprom Group, 2019, %



State environmental supervision

In 2019, state supervisory bodies conducted 628 environmental compliance verifications for Gazprom Group facilities, which resulted in 527 violations revealed. Upon the results of 388 verifications, violations were not revealed.

Out of 527 revealed violations, 50 violations (9.5%) have been cancelled through legal proceedings, 284 violations (54%) have been corrected at a given time, correction deadline for 103 violations has not expired in the reporting year. The year saw correction of 377 violations, including 93 remedied upon the results of inspections of previous years.

From the total number of identified violations, 269 (51%) did not constitute threat to the environment and did not carry penalties for legal entities.

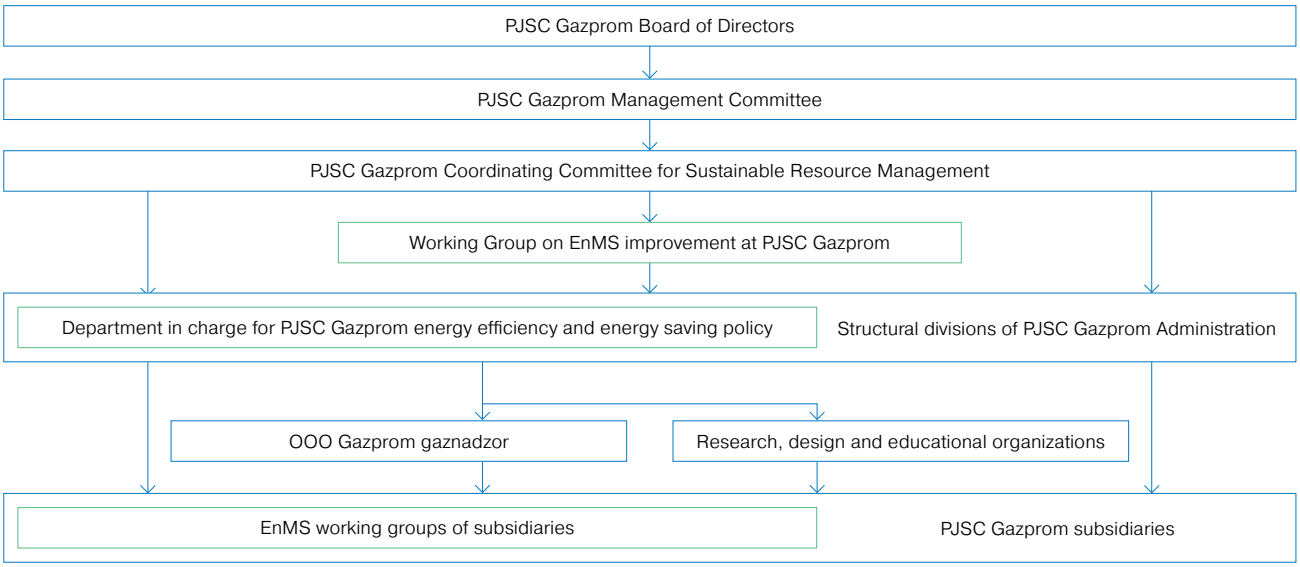
Penalties paid in the reporting year totaled RUB 14.63 mln, including RUB 2.25 mln as a result of previous years inspections. Penalty payments were as follows: Gazprom Neft Group — RUB 8.54 mln; PJSC Gazprom — RUB 2.93 mln; Gazprom energoholding — RUB 2.03 mln, OAO Tomskgazprom — RUB 0.67 mln, OOO Gazprom mezhregiongaz — RUB 0.16 mln; OOO Gazprom neftekhim Salavat — RUB 0.31 mln.

In 2019, compensation payments for damage to the environment by the Gazprom Group amounted to RUB 119.07 mln (of which PJSC Gazprom — RUB 27.24 mln), including RUB 90.43 mln paid for damage incurred in previous reporting periods (of which PJSC Gazprom — RUB 6.95 mln).

Improving energy efficiency and energy saving

In 2019, PJSC Gazprom stuck to the principle of rational use of energy resources, improvement of its energy efficiency and further reduction of greenhouse gas emissions at oparating facilities. The Company proceeded its work in strict compliance with its Corporate Energy Saving and Energy Efficiency Improvement Policy approved by PJSC Gazprom Decree No. 39 as of 11 October 2018 (hereinafter referred to as Policy of PJSC Gazprom).

Energy management system organization chart



Action plan on introduction of ISO 50001:2018 into PJSC Gazprom management activities and preparation to ISO 50001:2018 conformance certification in 2019 was implemented in said year to improve efficiency of using fuel and energy resources. The plan included development of regulatory and methodical energy management system documentation as well as training of PJSC Gazprom Administration specialists and employees from subsidiaries, carrying out internal audits. Analysis of the scope of use of energy resources and functioning of the energy management system as a whole has been performed.

PJSC Gazprom EnMS has been certified in compliance to ISO 50001:2018. Energy management systems - Requirements with guidance for use.

PJSC Gazprom succeeded in ISO 50001:2018 conformance certification of its energy management system. Upon certification audit results, independent international certification body made positive decision on issuance of the UKAS international accredited certificate (he UK's National Accreditation Body) on conformance of PJSC Gazprom energy management system to ISO 50001:2018 requirements as per declared the EnMS certification scope:

- production and treatment of natural gas and gas condensate;
- natural gas transportation;
- electricity, heat-, water supply and operation of energy equipment of the Unified Gas Supply System objects;
- underground gas storage.

In 2019, the Gazprom EnMS included 26 subsidiaries engaged in the main business activities of the Company, and structure divisions of PJSC Gazprom Administration.

Further expansion of PJSC Gazprom EnMS boundaries and application scope will be actualized through stepwise involvement of hydrocarbon processing business activity as well as inclusion in the scope of OOO Gazprom pererabotka and Gazprom transgaz Belarus.

PJSC Gazprom EnMS operation analysis includes annual analysis of its external stakeholders that impact EnMS performance at Gazprom and its subsidiaries. All requirements of the interested parties have been taken into account by PJSC Gazprom.

Achieved corporate energy target values

PJSC Gazprom energy policy defines priority tasks and trends for further advancement of the Company's energy efficiency. Target energy efficiency values have been developed and approved on the basis of this policy.

Energy efficiency target values are established for each subsidiary for PJSC Gazprom main activities in the form of absolute and specific indicators and are aimed at:

— reducing specific consumption of fuel and power resources during operation activities;
— saving energy resources (natural gas, electric and heat energy);

Total volume of consumed fuel and energy resources at PJSC Gazprom reduced by 2.9% in 2019. Specific consumption of fuel and energy resources in gas transmission sector, which is the most energy-intensive, decreased by 3.2%. Energy efficiency dynamics analysis confirms that consumption of energy resources for own operational needs of PJSC Gazprom has a steady downtrend for comparable scope of operations.

Reduction in specific consumption of natural gas for own operational needs during transmission
Target value for 2011–2020 — not less than 11.4%.
Achieved reduction in actual fact in 2011–2019 — 22.0%.
Goal achieved.

In 2011-2019, total volume of saved fuel and energy resources (FER) amounted to 26.4 mln tons of coal equivalent, including: natural gas — 22.4 bln m^3, electrical power — 2.5 bln kWh, heat power — 2.0 mln Gcal.

Cumulative sum of natural gas saved, bln m^3

2011	2.4
2012	4.2
2013	6.1
2014	8.2
2015	10.9
2016	12.8
2017	15.8
2018	19.1
2019	22.4

Cumulative sum of heat power saved, thousand Gcal

2011	102.9
2012	344.7
2013	562.6
2014	799.9
2015	1,004.9
2016	1,259.8
2017	1,528.2
2018	1,764.1
2019	2,016.9

Cumulative sum of electrical power saved, mln kWh

2011	194.1
2012	437.0
2013	742.9
2014	997.5
2015	1,258.1
2016	1,518.1
2017	1,849.6
2018	2,213.8
2019	2,544.3

Cumulative sum of all FER saved, mln tons of coal equivalent

2011	2.8
2012	5.0
2013	7.3
2014	9.8
2015	12.5
2016	15.3
2017	18.9
2018	22.5
2019	26.4

Energy Saving and Energy Efficiency Improvement Program

Energy Saving and Energy Efficiency Improvement Program has the following tasks:

— implementation of energy-saving measures to reduce consumption of fuel and energy resources in the most energy-intensive own operational needs areas of PJSC Gazprom taking into account experience of previous programs and achieved energy saving effect;

— introduction of energy effective innovative technologies to all areas of PJSC Gazprom's activities;

In 2019, 3.94 mln tons of coal equivalent were saved as a result of the Program execution. Implementation of the measures stipulated by Energy Saving and Energy Efficiency Improvement Program confirms fulfillment of accepted obligations on constant improvement of energy performance of operational processes, and saving of natural energy resources at process facilities.

Outcomes of PJSC Gazprom Saving and Energy Efficiency Improvement Program 2019

Type of activity	Saving		
	Natural gas, mln m^3	Electrical power, mln kWh	Heat power, thousand Gcal
Gas, condensate, oil production	392.74	28.67	16.37
Gas transmission	2,810.36	236.79	42.02
Underground gas storage	19.76	3.57	0.00
Gas, condensate, oil processing	40.83	40.71	192.15
Gas distribution	22.56	8.91	1.72
Minor types of activities	0.67	11.84	0.48
Total	3,286.91	330.48	252.74
Total, thousand tce	3,796.38	107.41	36.11

Measures undertaken in PJSC Gazprom subsidiaries in 2019 that allowed to save the main volume of fuel and energy resources comprise:

— optimization of operation mode of power equipment at process facilities;

— reduction in the volume of gas vented from pipeline sections subject to repair by gas removal to adjoining gas pipeline, use of mobile compressor stations, gas recovery from gas compressor units for own operational needs of a compressor station, gas recovery through gas distribution stations to consumers;

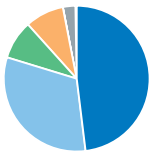
— introduction of effective lighting, heating and ventilation configurations;

— replacement and upgrading of gas compressor units;

— well research by telemetry tools without gas venting into the atmosphere.

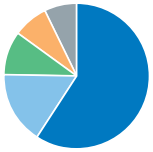
The biggest contribution in FER saving under the Energy Saving and Energy Efficiency Improvement Program was due to gas transmission sector.

Basic natural gas saving trends in trunkline gas transmission, 2019, %



Gas loss reduction at process facilities of CS, LS of GTL, GDS	48.1
Optimization of operation modes of GRS process facilities	31.8
Improvement of GCU technical state through repair	8.6
Reconstruction and upgrading of the process equipment	8.5
Gas consumption reduction for process needs of CS, LS of GTL, GDS	0.1
Other measures	2.9

Basic electrical power saving trends in trunkline gas transmission, 2019, %



Optimization of electrical equipment operation modes	59.3
Improvement of electrical equipment technical state through repair	16.2
Introduction of effective lighting, heating and ventilation configurations	9.8
Introduction of variable-frequency drive and soft start-up of E-motors	7.5
Other measures	7.2

In 2019, gas transmission subsidiaries expanded application of technologies and engineering solutions aimed at gas saving during repair operations. This resulted in positive uptrend on this position and allowed to save (prevent venting) over 1.2 bln m^3 in 2019.

Natural gas saved volume during repair of gas pipelines totaled 1.2 bln m^3 in 2019.

Achievement of the energy saving potential is mainly based on introduction of innovative technologies and engineering solutions.

The Company continued to apply the best energy efficient equipment: brand new energy-saving air cooling exchangers, concentric tubing system at field wells, assembled lube gas oil modules and gas oil heat exchangers at PJSC Gazprom compressor stations. In accordance with corporate programs, PJSC Gazprom adopts energy efficient technologies and equipment, such as turbo-expanders to produce liquefied natural gas and electrical power, energy efficient lighting facilities and lighting control systems, the use of mobile compressor stations to save gas during repair works.

To finance effective and innovative engineering projects, the Company made a decision to attract additional investments on the basis of energy service contract mechanisms.

Internal audit

According to PJSC Gazprom EnMS internal audit Program 2019, internal audits were performed in OOO Gazprom dobycha Yamburg, OOO Gazprom dobycha Noyabrsk, OOO Gazprom dobycha Astrakhan, OOO Gazprom transgaz Yugorsk, OOO Gazprom transgaz Tomsk, OOO Gazprom energo, OOO Gazprom transgaz Saint-Petersburg, OOO Gazprom transgaz Moscow, OOO Gazprom transgaz Ukhta, OOO Gazprom transgaz Kazan, OOO Gazprom UGS.

Correction action plans were developed upon the results of this internal audits. It was concluded that the EnMS of PJSC Gazprom and its subsidiaries complies with ISO 50001:2018 requirements, legislative and applicable energy-saving and energy performance improvement requirements

Training

Personnel proficiency in energy performance improvement issues is a firm basis for implementation of PJSC Gazprom Energy Saving and Energy Efficiency Policy.

In 2019, PJSC Gazprom management and specialists of subsidiary companies completed the following courses within the corporate system of continuous vocational training:

— Energy saving and energy efficiency;
— Executive role in energy management system in accordance with ISO 50001:2018 requirements;
— Energy saving and improvement of energy efficiency at the enterprise.

Over 600 Company's employees completed training.

Public activities

PJSC Gazprom subsidiaries and the Gazprom Group companies take active part in the annual All-Russian Energy Saving Festival #VmesteYarche, as well as develop in-house dedicated plans and events for promotion of specific energy-saving measures.

In 2019, PJSC Gazprom's subsidiaries and the Gazprom Group companies developed and carried out over 400 events to support #VmesteYarche Festival: energy-saving topical lessons and weeks in educational and pre-school institutions, creativity and research competitions, topical quests, energy-saving special occasions, open days at production sites, various educational and charity events. Activities of subsidiaries and individual groups under the scope of festival were highly appraised by regional executive authorities and received strong support from regional mass media.

OOO Gazprom transgaz Stavropol project won N.K. Baybakov Award on the Moscow Forum "Power industry and civil society – 2019" for breakthrough in addressing the issues of sustainable development of power industry and society. Contest Committee singled out comprehensive system of industrial safety improvement, ecological performance and fuel & energy resources saving during repair and maintenance of gas pipeline facilities to be developed on the basis of gas transmission company.

PAO Gazprom Neft

PAO Gazprom Neft runs the Energy Policy, which is the basis of the EnMS. Since 2011, it is being introduced in the company's organizations in a stepwise manner. PAO Gazprom Neft EnMS complies with ISO 50001 requirements. The company implements the plan of energy management system development for 3 years. This plan envisages introduction of new and updating of outdated regulatory documents, personnel training, and switching to new version of ISO 50001:2018.

Energy and engineering policy of PAO Gazprom Neft pursues the goal of energy efficiency improvement under required level of reliability, safety and productivity, as well as mitigation of harmful environmental impact and reduction in consumption of nonrenewable energy resources.

The Program of energy saving and energy efficiency improvement is the main mechanism that helps the company to achieve planned energy efficiency values. In 2019, the Program outstripped the target by 28%, and thus the company saved RUB 1,989 mln.

PAO Gazprom Neft energy efficiency performance in 2019

	Upstream	Downstream	Total
FER consumption			
Electrical energy, mln kWh	9,449	3,218	12,667
Heat power, Gcal	477,148	8,661,609	9,138,757
Associated petroleum gas, mln m^3	7,487	0	7,487
Natural gas, mln m^3	120	876	996
FER saving			
Heat power, Gcal	—	205,011	205,011
Electrical energy, thousand kWh	333,750	7,090	340,840
fuel, t	697	67,791	68,488
water, thousand m^3	—	542	542

List of relevant energy-saving measures:

- replacement of electrical centrifugal pump units with increased efficiency factor;
- replacement of asynchronous electrical submersible motors on high voltage self-controlled inverter-bed motors;
- well conversion into the mode of short-term/periodic operation;
- carrying out geological and engineering measures to reduce produced water and inject it into formation;
- installation of variable speed drives for pump equipment and air-cooling units;
- introduction of energy effective rotors at pump units;
- reconstruction/upgrading of pump units;
- installation of light-emitting diodes, infrared and induction heaters, reducing electrical energy losses in networks;
- reconstruction/technical re-equipment of process furnaces at oil refineries;
- improving operation efficiency of heat exchange equipment at oil refineries;
- heat recuperation of process flows at oil refineries (remanifolding, increasing heat exchange surface, change of heat exchange unit type, etc.);
- optimization of steam-condensate systems at oil refineries;
- optimization of heat supply configurations at oil refineries;
- reconstruction/technical re-equipment of process furnaces, boilers to increase generation of heat energy.

Gazprom energoholding

Gazprom energoholding is one of the largest producers of electrical and heat power that reasonably determines relevance of its energy-saving and energy efficiency improvement activities.

OOO Gazprom energoholding energy efficiency and energy saving policy is a set of program measures aimed at arrangement of required organizational, legal, financial, material and other conditions for rational use of fuel and energy resources.

All Gazprom energoholding companies have energy-saving and energy efficiency improvement programs, which are guiding documents that formulate scope, targets, and core energy-saving operations. The Program's goal is to provide FER saving and enhance energy efficiency of technological business processes on the basis of energy-saving measures.

Energy-saving program implementation values at Gazprom energoholding Group in 2019

Value name	Actual value
FER consumption (water excl.), thousand tce	63,627
Total FER saved, including, thousand tce:	1,614.9
Electrical power, mln kWh	670.8
Heat power, thousand Gcal	297.2
Fuel, thousand tce	1,375.6

Main energy performance target value at Gazprom energoholding is specific fuel equivalent consumption for heat and electrical power delivery, which is individually set for each company from Gazprom energoholding. Actual data analysis confirms implementation of target values determined for 2019.

Cost of saved energy resources due to fulfillment of energy saving program at Gazprom energoholding amounted to RUB 7,391 mln. Cost advantage from introduction of energy-saving measures is achieved both by economic effect of investment measures aimed at energy-saving, and through a by-effect of upgrading, reconstruction and overhaul repair.

List of relevant energy-saving measures at Gazprom energoholding:

- operation of combined cycle gas units;
- transfer of heat loads from district and block heating stations to central heating and power plants;
- operation of hydrodynamic couplings;
- replacement of lighting sources on light-emitting diodes;
- reconstruction and automation of energy-consuming facilities with the use of energy efficient equipment;
- improving equipment energy performance during repair;
- installation of electric boilers to replace fuel oil equipment;
- reconstruction of heat networks with application of new technologies.

Role of natural gas in low-carbon development

Environmental impact of gas infrastructure development

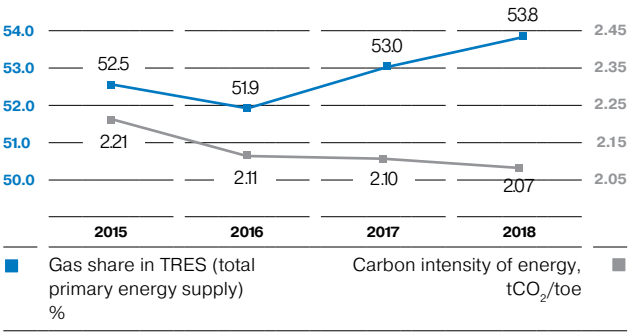
PJSC Gazprom makes meaningful contribution to the low-carbon development of the Russian economy and the countries that import Russian gas. According to the International Energy Agency (IEA), carbon intensity of power generation from natural gas is 1.5-2.5 times lower than that of oil and coal: 400 g CO_2/kWh compared to 600 g CO_2/kWh and 845–1020 g CO_2/kWh respectively (depending on the type of coal). At a global level, the increase in natural gas consumption since 2000 has prevented almost 3 billion tons of carbon dioxide emissions.

The development of gas infrastructure in Russian regions is one of the Gazprom's most large-scale and socially significant focus area that helps to increase the share of natural gas in power and heat generation, and thus reduce greenhouse gas (GHG) emissions.

The carbon intensity of electricity in Russia is relatively low as compared to the global situation and other large CO_2-emitting countries (USA, Germany, Japan, China, India, etc.) thanks to the high share of gas. According to the Analytical Centre for the Government of the Russian Federation, the carbon intensity of the Russian power sector decreased by 59.5 g CO_2/kWh to 358 g CO_2/kWh (-9%) in 2010–2016. This is equal to 42.7 mln tons (-10%) decrease of CO_2 emissions in the power industry for the given period while electricity generation increased by 51 bln kWh (+5%).

There is a direct correlation between the increase in the share of natural gas in total primary energy supply (TPES) and decrease in the carbon intensity of Russia's energy sector.

Correlation between the share of natural gas in TPES in Russia and carbon intensity of the Russian energy sector



Source: IEA

The additional substitution of coal by natural gas in the heat and power sector in Russia and abroad will ensure significant GHG emissions reduction and the achievement of ambitious climate targets in the fastest and cheapest way.

PJSC Gazprom supplies its consumers with low carbon energy and has the lowest carbon footprint of its supply routes along the whole production chain, i.e. the minimum GHG emissions. Pipeline natural gas supplies via new routes (Nord Stream, TurkStream) are characterized by lower emissions, as compared to existing natural gas supplies to Europe.

Carbon intensity of various natural gas supply routes to Europe, g CO_2e/MJ (LHV)

LNG	
Qatar	13.6
Algeria	16.3
USA	22.3
Pipelins	
via Ukraine	10.6
TurkStream	7.3
Nord Stream	6.3

Source: Thinkstep

Gas supplies via TurkStream instead of the Ukrainian corridor will result in greenhouse gas emissions reduction in the amount of 4 million tons of CO_2e annually, and 20 million tons of CO_2e per year as compared to LNG deliveries from the USA.

Switching transport sector to natural gas

The expansion of natural gas use as a motor fuel is Gazprom's contribution to the climate and environmental policy of the Russian Federation. Transport is one of the main sources of pollutant emissions; it takes 40% of the total volume of pollutant emissions into the atmosphere (80–90% in metropolises) and about 10% of GHG emissions.

Today, natural gas with methane as its major component (92–98%) is the most promising alternative fuel. Natural gas can be used as a motor fuel both in compressed, and in liquefied form. Switching transport to natural gas as a motor fuel will not only reduce negative impact on the environment, but extend the life of engines and vehicles, reduce prime-cost of transportation, and improve the energy performance of the transport system.

Gazprom carries out systematic work to expand the use of natural gas as an engine fuel. In 2016, the Gazprom Management Committee approved the Program on the Development of Gas Fueling Infrastructure at Industrial Sites of Subsidiaries for 2017–2019, as well as the Program on Development of Low Tonnage Production and Use of Liquefied Natural Gas (LNG), which provides for a number measures to convert Gazprom's vehicles to gas and install gas fueling modules at industrial sites of the Gazprom Group companies.

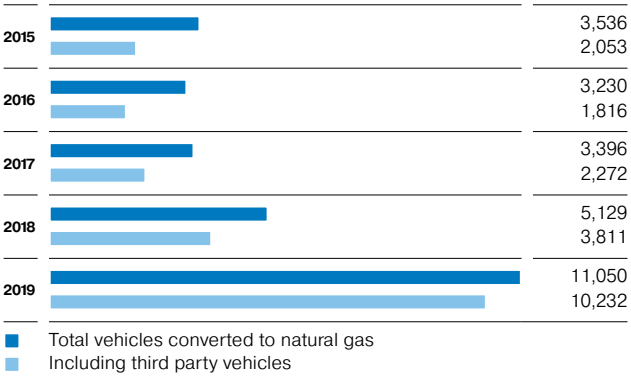
In 2019, the Company built over 40 new gas refueling facilities (modern NGV-refuelling compressor stations, gas-filling modules at existing filling stations, and locations for the allocation of mobile NGV refuelers).

The Company continues to convert its own fleet to natural gas. It is planned that the end of 2020 will see 70% increase in the number of NGVs at Gazprom's subsidiaries. Gazprom is also developing the network of NGV compressor stations, and coordinates the work of interested parties of the Russian gas engine market.

In 2019, the Gazprom Group enlarged its NGV fleet by 11,050 units.

PJSC Gazprom converted 10,340 vehicles and OOO Gazprom mezhregiongaz — 706 vehicles to natural gas.

The number of vehicles converted to natural gas in the Gazpom Group, 2015–2019, units/year



Switching transport to natural gas fuel significantly reduces emissions both in the fuel use phase and along the entire fuel production chain. GHG emitted during production of compressed natural gas (from production to refueling) are 4 times lower, than from conventional petroleum engine fuels. The GHG emission reduction potential is estimated at 65 mln tons of CO_2 annually in case 50% of vehicles are converted to natural gas in the Russian Federation.

The IX St-Petersburg International Gas Forum saw signing of documents on the expansion of natural gas utilization as a motor fuel between PJSC Gazprom and the management of some territorial entities of the Russian Federation, as well as signing of roadmaps on accelerated development of the gas motor market until 2024 in Saint-Petersburg, the Leningrad and Kaliningrad regions. The roadmaps provide for the construction of new gas refueling network facilities, including cryogenic refueling stations, and the development of new service centers for the re-equipment and maintenance of NGVs. The Forum also witnessed signing of agreements on the expansion of the use of gas as a motor fuel in the Nizhny Novgorod and Lipetsk regions, as well as in the Republic of Tatarstan.

The roadmap on strategic cooperation in the use of gas-motor fuel was signed with OOO SIBUR. An Agreement on the areas of strategic cooperation was signed with OOO United Machine-Building Company. The synergy of the parties will be focused in particular on organizing the production of new gas-fueled heavy trucks and special-purpose vehicles, and improving their technical and operating parameters. Special attention will be paid to consideration of imports phase-out suggestions and the local content of the production of gas equipment and spare parts. Another important step was the signing of a roadmap on memorandum of cooperation on the use of natural gas as a motor fuel in water transport with AO Alexeev's Hydrofoil Design Bureau was another key step. The roadmap envisages the development of NG ship engine and gas-motor fuel storage system for high-speed vessels, standard solutions for inland navigation LNG bunkering and floating filling points for river ships.

Crucial focus area of the Company on expansion of the Russian gas fuel market is LNG production and trade, as LNG has a high application potential in road, water and rail transport, mining and agriculture industry. It is expected that new distribution infrastructure facilities — stationary cryogenic filling stations and mobile LNG filling stations will be developed. The implementation of the program will help Gazprom to build a large business segment, increase natural gas trading, and improve operational efficiency of existing GDS. Currently, the Company is working on a number of pilot projects for the use of LNG on transport. In 2019, methane vehicles were exhibited in Saransk (the Republic of Mordovia) and in Ukhta (the Komi Republic) to demonstrate the benefits of using natural gas as a motor fuel. Workflow charts, specifics of utilization, diagnostics and maintenance of NGVs and compressed gas vehicles were also presented on the exhibitions.

The 20th of September saw the start of the Russian phase of the international rally Blue Corridor — Gas in Engines 2019 in the Krasnodar Territory at the Russkaya compressor station. The participants of the Russian stage took up the baton via live TV link-up from the European crew, which covered 5,320 km from Istanbul (Turkey) to Lubmin (Germany) from 29 August to 20 September. More than 20 light NGVs, heavy trucks with gas engines and passenger NGVs traversed 2,760 km of the Krasnodar Territory, Rostov, Voronezh, Belgorod, Moscow, Novgorod and Leningrad regions. 13 Gazprom gas filling compressor stations supplied the vehicles with natural gas along the route.

Moscow, Belgorod and Rostov-on-Don hosted thematic conferences, where rally participants, representatives of car manufacturers, government authorities, experts and potential consumers discussed the prospects of the NGV market in Russia.

The rally ended on the 3rd of October in Saint-Petersburg, and became a flagship event of the IX St. Petersburg International Gas Forum (hereinafter referred to as the Forum). The rally confirmed benefits of natural gas as a motor fuel.

Low-carbon development: assessing risks and opportunities

On a voluntary basis PJSC Gazprom puts into practice of corporate management, strategic planning, risk assessment, reporting and implements the control recommendations of Task Force on Climate-related Financial Disclosures (TCFD) in order to keep interested parties informed.

In accordance with the above recommendations, PJSC Gazprom identifies and evaluates two main types of climate risks:

— risks related to the transition to a low-carbon development scenario (transition risks),
— risks related to physical changes in the environment due to climate changes (physical risks).

There can be three types of time scenarios for risk assessment: short-term — up to 1 year, medium-term — from 1 to 3 years, long-term — from 3 to 10 years and more. Risks are assessed at the level of the Company, and at the level of its subsidiaries. Information is published on the CDP platform, in environmental reports and sustainable development reports. Scenario analysis is one of the recommendations of the TCFD. It involves the use of simulations to assess the impact of various climate factors on the future financial performance of the Company.

In 2019, the project “Programs for adaptation of Gazprom operational activities to changing climatic and geocryological conditions” was developed taking into account probable scenarios of climate changes in the areas where Company’s facilities are located. These risks were estimated in cooperation with RAS institutions (Institute of Environmental Geoscience, Institute of Oil and Gas Geology and Geophysics, etc). The results of this work are based on the analysis of accumulated and new data obtained using hi-tech tools. They helped to identify regularities in natural and industrial evolution of the permafrost soils, classify territories according to geocryological hazards, optimize the design of structures and costs of their engineering protection. Moreover, coupled termo-mechanical calculation methods at different levels of synthesis were developed. The geotechnical monitoring system was improved with the help of the national instrumental base. The conducted investigations contributed to the development of comprehensive measures on adapting Gazprom’s operating activities to changing climatic and geocryological conditions, including regulatory, methodological, technological, informational and administrative aspects.

To ensure safe construction under complex geocryological conditions, all participants of the process must follow STO Gazprom Design of basements, foundations, engineering protection and monitoring of PJSC Gazprom’s facilities in the Far North.

The following works are performed to provide long-term performance reliability of producing gas wells and well pads under extremely difficult geocryological field conditions:

— allocation of gas well pads (clusters) on sites with less difficult geocryological conditions following the study of spatial variability of permafrost composition and cryogenic structure;
— development of a gas well design capable of ensuring mechanical stability;
— development of comprehensive solutions for temperature stabilization of permafrost rocks in wellhead areas with the use of insulated lift pipes and steam-liquid cooling systems.

As for the development of adaptation technologies, PJSC Gazprom cooperates with subsidiaries from the R&D sector of the Company, a large number of external research organizations and manufacturers of related industries, small and medium-sized innovative companies, and large foreign companies (on specific trends of adaptation activities).

PJSC Gazprom participates in the CDP assessment on an annual basis. In the 2019 questionnaire PJSC Gazprom answered all questions related to the TCFD disclosure, including:

— engagement of top management into climate risk management;
— use of scenario analysis results in strategic planning;
— identification of climate risks, both physical and transition;
— monitoring the achievement of climate objectives using specific indicators.

Since 2018, the TCFD recommendations have been integrated into the CDP questionnaires. This allowed PJSC Gazprom to apply these recommendations in its questionnaire. In 2019, in accordance with the TCFD recommendations and in addition to the previous evaluation of direct and indirect GHG emissions of Scope 1 and 2, PJSC Gazprom evaluated data on indirect GHG emissions of Scope 3.

PJSC Gazprom cooperates with CDP under the initiative to formulate science-based climate targets (SBTi[1]). Since methodology for setting such targets has not yet been developed for the oil and gas industry, PJSC Gazprom carried out the work in this area on its own.

On the 4th of October 2019, enlarged session of PJSC Gazprom Science and Technology Board (STB) and Sustainable Development Council under STB Chairman was held within the IX St. Petersburg International Gas Forum to examine the potential of natural gas in implementing low-carbon development strategies. The session culminated in initiation of the work on the elaboration of Gazprom sustainable development scenarios up to 2050 , taking into account the low-carbon trend of the global economy.

The low-carbon trend strengthened the position of hydrogen as an energy source on the international market. The production and use of hydrogen and methane-hydrogen mixtures is a prospective trend towards diversification and efficiency enhancement of natural gas utilization. In fact, the gas industry is progenitor of a hydrogen industry. According to the International Energy Agency, the share of natural gas in the global hydrogen production is 70%, in Europe — 95%. Every year, around 200 bln of cubic meters of natural gas are used as a feedstock for hydrogen production, and this way the use of natural gas has a significant potential. According to optimistic forecasts, hydrogen consumption is expected to increase 7 times by 2050. New areas of hydrogen use are emerging: freight and passenger transport, heating of buildings, storage and generation of energy.

Hydrogen production is not a unique activity of Gazprom. Gazprom's gas and oil refineries traditionally use hydrogen in industrial processes, for example in the production of light oil. Today, the Gazprom Group companies produce over 350 thousand tons of hydrogen annually. Methane pyrolysis is done at a commercial scale and generates 2.5 thousand tons of hydrogen.

Currently, the following comprehensive R&D projects are underway at PJSC Gazprom:

— development of innovative technologies for the use of methane-hydrogen mixtures in operating activities (to reduce the carbon footprint and increase the efficiency of Russian gas supplies);
— development of innovative technologies of hydrogen production from methane with zero GHG emissions (to diversify and improve the efficiency of pipeline gas use).

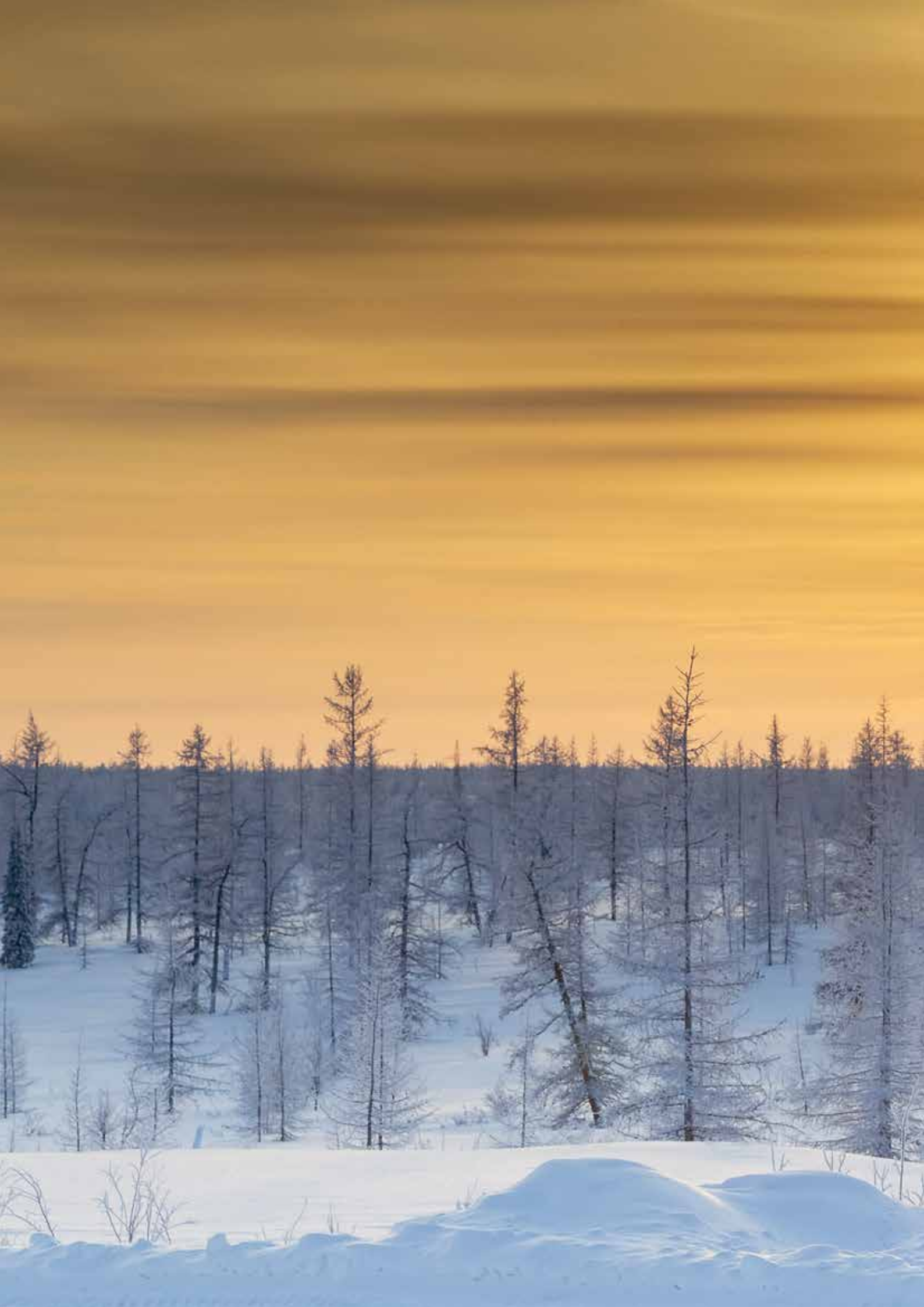
Within the framework of the Federal Target Program "Research and pilot projects on priority development trends of the Russian science and technology sector for 2014–2020", PJSC Gazprom declared itself as an industrial partner for the project "Development of scientific basis for technology and design of hydrogen production equipment for production of methane-hydrogen mixtures and for the needs of the hydrogen economy". The participants of the project are as follows: Samara State Technical University (general contractor), Institute of Petrochemical Synthesis of RAS, Institute of Problems of Chemical Physics of RAS, Boreskov Institute of Catalysis of RAS. The project should finalize with the technology of natural gas pyrolysis in the liquid metal-cooled reactor. The degree of conversion of natural gas reached 86% during laboratory tests. The instrumentation design and optimization of the laboratory bench are underway.

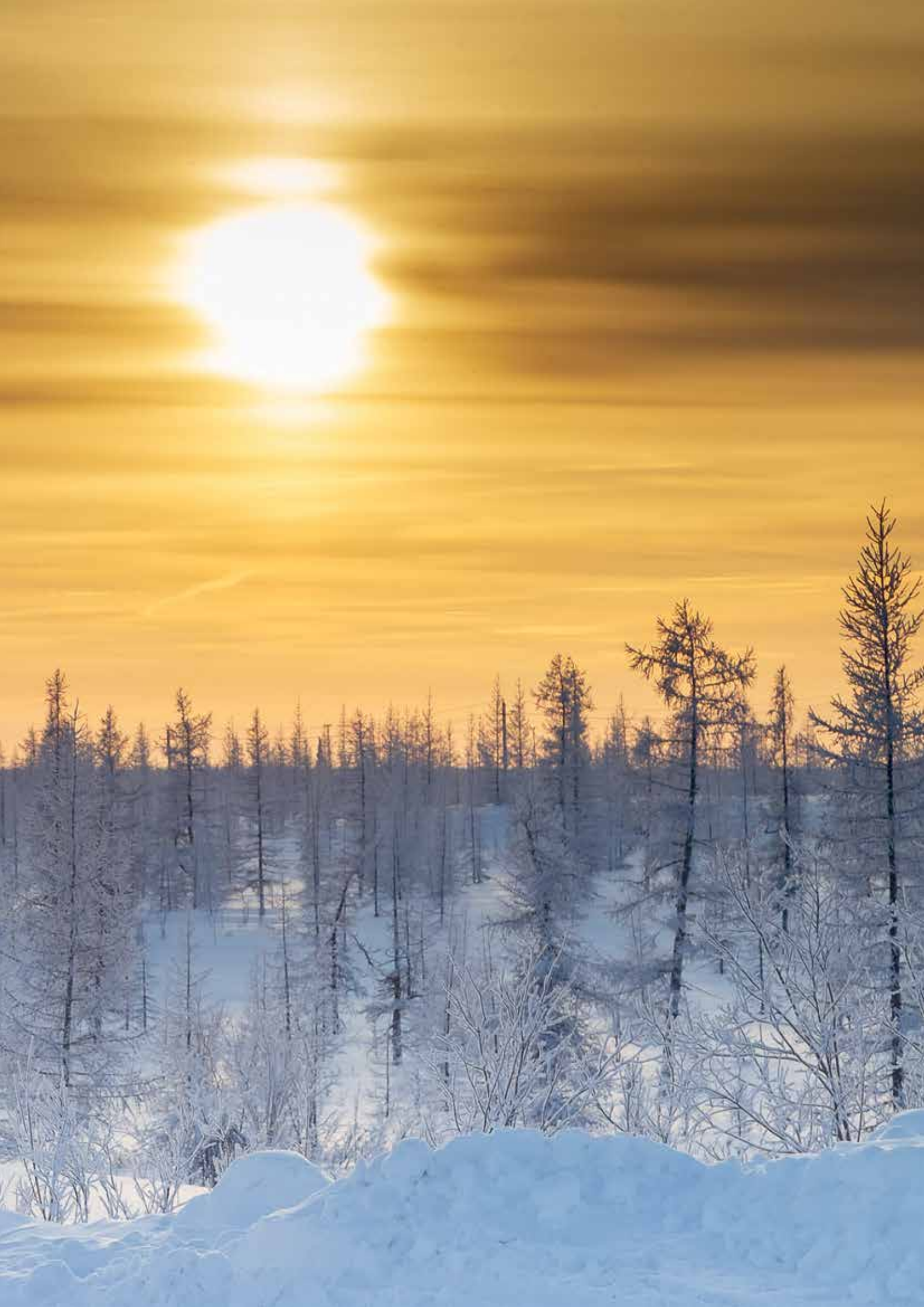
In 2019, Tomsk Polytechnic University on behalf of PJSC Gazprom conducted successful tests of the unit producing hydrogen from natural gas in a non-equilibrium low-temperature plasma. Tests results confirmed the opportunity of hydrogen production by direct conversion of natural gas and good potential for hydrogen production without direct GHG emissions.

On a regular basis, PJSC Gazprom maintains technical dialogues with the leading Russian institutes of academic and applied studies aimed at the development of the hydrogen industry. Cooperation with the international companies to identify the top-priority development trends for hydrogen technologies and demonstrate the potential of natural gas in low-carbon transition is performed carried out through science and technology cooperation programs.

In 2019, OOO Gazprom VNIIGAZ, the main research & development institute of PJSC Gazprom, established a special laboratory to coordinate the development of hydrogen technologies. At present, ecological and economic indicators for the life cycle of hydrogen production technologies are being estimated.

[1] https://sciencebasedtargets.org/oil-and-gas/



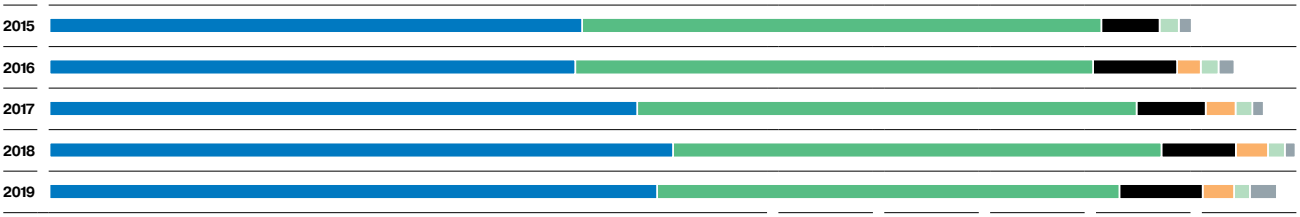


Greenhouse gas emissions

All companies of the Gazprom Group carry out control and accounting of greenhouse gas (GHG) emissions. Since 2016, all Group subsidiaries regardless of their business activities have been monitoring and calculating the quantity of GHG emissions according to a uniform procedure described in the Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities engaging in Business and other Activities in the Russian Federation approved by the Order No. 300 of the Ministry of Natural Resources and Environment of the Russian Federation as of 30 June 2015.

In 2019, GHG emissions from the Gazprom Group facilities totaled 236.45 mln tons of CO_2e that is 3.52 mln tons of CO_2e less than in 2018.

Gazprom Group GHG emissions, 2015–2019, mln tons CO_2e



	2015	2016	2017	2018	2019
PJSC Gazprom	102.56	101.24	113.17	120.09	117.09
Gazprom energoholding	99.99	99.72	96.17	94.06	89.03
Gazprom Neft Group	11.22	16.18	13.31	14.33	16.04
Gazprom neftekhim Salavat	—	4.56	5.75	6.18	6.04
Sakhalin Energy	3.70	3.42	3.22	3.25	3.05
Other companies	2.49	3.07	2.21	2.06	5.20

The GHG emission control and accounting system includes all required components, such as condition monitoring of process facilities; development and adoption of the Best Available Techniques (BAT) and innovative resource and energy-saving technologies, corporate regulatory documents and information support for Gazprom's top management decisions.

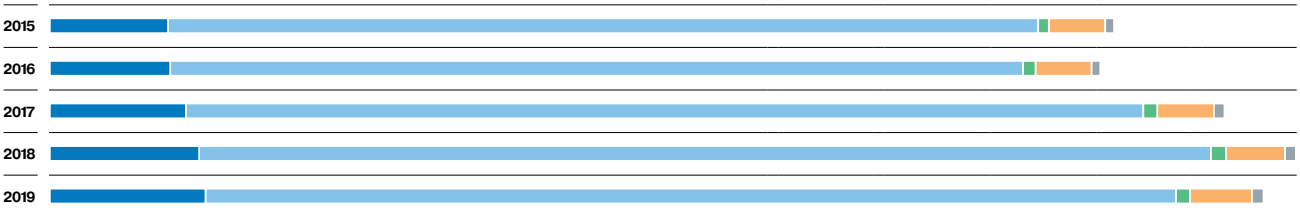
PJSC Gazprom's reporting on the GHG emissions reduction covers the parent company PJSC Gazprom and all its 100%-owned subsidiaries and organizations involved in the production (including geological exploration), transportation, underground storage and processing of hydrocarbons, as well as the maintenance of the UGSS that the Company manages financially and operationally.

PJSC Gazprom takes into account that the accuracy of the quantitative assessment of GHG emissions may be affected by some uncertainties, in particular measurement errors of natural gas flow meters, methodological inaccuracies in natural gas volume computational methods and analytical methods for estimating of physical and chemical parameters of fuels and hydrocarbon mixtures (density, volume components), as well as risks of intentional or accidental misrepresentation of information in the course of collecting, consolidating and processing of source data used for the quantitative assessment of GHG emissions. These risks are identified and managed at all stages of data collection and generalization of reporting. According to the Corporate Accounting and Reporting Standard "The Greenhouse Gas Protocol", potential deviations due to the cumulative effect of all potential negative factors can be deemed insignificant, if they do not exceed 5% of the total volume of GHG emissions.

In 2019, GHG emissions at PJSC Gazprom's facilities decreased as compared to 2018, mainly due to the implementation of measures to reduce fuel gas consumption and prevention of natural gas venting into the atmosphere during repair of natural gas trunklines.

In 2019, the reduction of methane emissions during repair works on gas trunklines resulted in GHG emissions cut of 21,157.2 thousand tons of CO_2e

Greenhouse gas emissions dynamics at PJSC Gazprom by types of activities, 2015–2019, mln tons of CO_2e



	2015	2016	2017	2018	2019
Production	11.39	11.60	13.07	14.39	15.01
Transmission	83.87	82.20	92.28	97.52	93.65
Underground gas storage	1.02	1.20	1.34	1.44	1.33
Processing	5.44	5.41	5.46	5.71	5.99
Other types of activities	0.85	0.83	1.02	1.03	1.11

The reduction of absolute GHG emissions from the core business activities of PJSC Gazprom in 2019 by 2.5% as compared to 2018 corresponds to criteria of science-based climate targets (SBTi within the CDP) in line with a scenario that limits the average global temperature growth well below 2 degrees above pre-industrial levels.

In 2019, GHG emissions from PJSC Gazprom facilities totaled 117.09 mln tons of CO_2e methane accounts for 28%.

Methane emissions at PJSC Gazprom by types of activities, 2019, mln tons of CO_2e

Type of activity	CH_4 emissions
Production	1.30
Transmission	31.07
Underground gas storage	0.40
Processing	0.03
Other types of activities	0.05

According to 2019 data, methane emissions from Gazprom's production facilities amounted to 0.02% of the volume of gas produced, 0.29% of the volume of gas transported, and 0.03% of the volume of natural gas stored underground.

PJSC Gazprom participates in the international initiative "The Guiding Principles on Reducing Methane Emissions across the Natural Gas Value Chain" and exchanges experience with its partners on the best methane emissions reduction practices, assists in the distribution of information on the relevant technical solutions and the involvement of interested parties in the above-mentioned activities to reduce the carbon footprint of their products.

Greenhouse gas emissions at PJSC Gazprom by emission source categories, 2019, mln tons of CO_2e

Sources (processes)	Total	CO_2	CH_4
GHG emissions, total	117.09	84.25	32.84
Stationary fuel combustion	78.05	78.05	0.00
Flaring	2.56	2.48	0.08
Fugitive emissions	32.76	0.00	32.76
Other industrial processes	3.60	3.60	0.00
Air transport	0.09	0.09	0.00
Railway transport	0.03	0.03	0.00

In order to provide more reliable data on the impact of GHG emissions on the climate system and with due account of the recommendations of the Intergovernmental Panel on Climate Change (IPCC), as well as in accordance with the decision of the Conference of the Parties serving as the meeting of the Parties to the Paris Convention[1], PJSC Gazprom additionally uses Global Temperature change Potential over a 100-year time horizon from the 5th IPCC Assessment Report to calculate cumulative emissions in CO_2-equivalent. Thus, to represent fossil methane emissions (CH_4) in CO_2-equivalent, conversion factor 6 is used.

With account of Global Temperature change Potential, GHG emissions of the Gazprom Group totaled 211.2 mln tons of CO_2e, GHG emissions of PJSC Gazprom totaled 92.1 mln tons of CO_2e.

GHG emissions are also mitigated through the implementation of the Gazprom Group GHG Emissions Management Roadmap until 2020 and in the long term, until 2030.

Out of the whole set of measures classified by types of operating activities: the production of hydrocarbon feedstock, natural gas transmission, underground storage of natural gas and hydrocarbon feedstock processing, use of associated petroleum gas, LNG production, heat and power generation, the Roadmap defines the main operational areas with due consideration of their efficiency and the greatest effect on reducing GHG emissions, including implemented, tested and innovative technologies.

[1] Resolution 18 / CMA.1, Appendix, article 37.

Main greenhouse gas emission reduction activities undertaken in the gas industry

Business processes	Name of the activity
Gas production	Retrofitting of compressor shops with replacement of GCU
	Overhaul repair of GCU
	Reconstruction of plant power stations at CS
	Use of energy-saving technologies during scheduled maintenance of the process equipment and pipelines
Gas transmission	Retrofitting of compressor shops with replacement of GCU
	Replacement of operated pipes by pipes with internal smooth coating at the linear section of gas trunkline (LS of GTL)
	Optimization of the process operation modes of GTS facilities:
	Increasing gas pressure in GTS;
	Ensuring balanced load of compressor shops at CS with multiple shops with the use of intershop bridges;
	reduction in compression losses at CS flowlines and bridges;
	gas transmission by the minimum number of GCU with full use of GCU capacity;
	optimal performance of GCU superchargers in the volumetric capacity zone with high polytropic performance factor;
	adoption of the information & analytical monitoring system for energy performance indicators of LS of GTL, CS
	Reduction in the volume of gas vented during overhaul repair at LS of GTL:
	gas recovery via GCU from the shut-off section of gas pipeline decommissioned for repair,
	gas removal from the shut-off gas pipeline section to adjacent section of GTL connected by bridges,
	gas recovery via GCU from the shut-off gas pipeline section to the inlet of the next CS, or multi-stage gas recovery at GCU of one CS,
	gas removal from the shut-off gas pipeline section to inlet of the other GTL section with the help of mobile compressor stations.
	Use of energy-saving technologies during scheduled maintenance of the compressor shop:
	removal of gas from shut-off compressor shop circuit to adjacent and technologically aligned compressor shop for own process needs,
	removal of gas from shut-off compressor shop circuit to adjacent section of GTL via bridges.
	Introduction of dust catcher flushing at CS and GDS without gas venting
	Carrying out repair works at GTL section without stopping gas transmission:
	hot tapping with the use of special equipment,
	repair of defect sections of pipelines by fiberglass couplings with threaded tightening,
	repair of defect pipes by polymer composite materials
	replacement of tap valves and installation of split couplings without stopping gas transmission.
	Use of methane-hydrogen mixture as a fuel for GCU with gas turbine unit
Gas processing	Replacement of SG-ZP-M reforming catalyst with GPS series reforming catalysts
	Replacement of KGU-950 outdated hydrotreatment catalyst with a more efficient one
	Involvement of hydrogen-bearing gas into the fuel system, optimization of circulation hydrogen-bearing gas feeding into mixing T-branch
	Repair of brickwork of process furnaces, use of new insulation types
	Replacement of adsorbent in installations during scheduled repair of sections
	Processing of liquid hydrocarbons from the receiver in case of helium unit shut-off for repair at ethane fractionation unit and broad fraction of light hydrocarbons unit of operating helium installations
	Decrease in gas consumption for own needs by process flow tests of steam boilers
Underground gas storage	Gas removal to GTL
	Gas removal from gas pipelines, process reservoirs and process lines of compressor shops to low-pressure consumer networks during scheduled maintenance
	Commissioning of gas treatment unit with automatic purging
	Removal of gas from gas drying unit after the period of recovery into low-pressure networks

PJSC Gazprom submits data on its indirect GHG emissions in order to provide interested parties with information on emissions along the entire production chain.

Indirect energy greenhouse gas emissions at PJSC Gazprom by types of activities, 2019, CO_2e

Type of activity	Indirect energy emissions (consumption of electrical energy), mln t CO_2-eq.
Production	0.35
Transmission	3.33
Processing	2.34
Underground gas storage	0.06

In 2019, PJSC Gazprom for the first time ever evaluated Scope 3 of GHG emissions that includes indirect emissions from sources emerging arising from the use of products as fuel and feedstock in Russia and abroad. The emissions were calculated from the following types of products sold: natural gas, oil and gas condensate, automobile petrol, diesel and jet fuel, LPG, fuel oil. To account for all possible emissions when using Gazprom Group products emission factors were applied in accordance with the Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities engaging in Business and other Activities in the Russian Federation approved by Order No. 300 of the Ministry of Natural Resources and Environment of the Russian Federation dated 30 June 2015.

The use of products sold exceeds 90% of the total volume of emissions associated with oil and gas companies[1]. Therefore an estimation of GHG emissions of Scope 3 is made for this priority category.

According to BP Energy Outlook 2019, the share of natural gas as a non-energy resource is 5.6%, while the share of oil is 16% globally. Accordingly, the actual emissions from product use are likely to be lower than the calculated values of Scope 3 values for the reported values of non-fuel use of hydrocarbons.

Volume of GHG emissions under scope 3 for Gazprom Group in 2019

Sold products	Volume of GHG emissions, mln t CO_2e
Gas	930.09
Oil and gas condensate	83.84
Other energy sources	140.61
Total	1,154.54

The carbon intensity of combustion of Gazprom Group's products by end-use consumers totaled 301.63 kg CO_2e/BOE.

[1] CDP Technical Note: Guidance on the methodology of estimating emissions of category 11 of scope 3 for oil and gas companies

Use of renewable and secondary energy sources

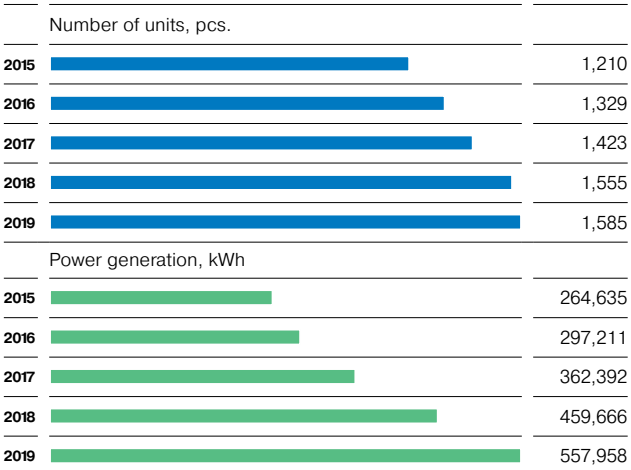
The Gazprom Group supports and develops the use of alternative energy sources wherever it is economically and technically feasible, especially in remote or technologically isolated areas.

The Gazprom Group uses renewable energy sources (RES) and secondary energy sources (SES) for auxiliary needs and sale to external consumers. Solar and wind generators, gas flow heat and energy power converters are widely applied at production, gas trunkline transmission facilities and gas distribution networks to provide current power supply to telemetry systems ensure, cathodic protection of pipelines, lighting, etc.

In 2019, PAO TGK-1 (Gazprom energoholding) and OOO Nugush hydroengineering complex (Gazprom neftekhim Salavat) generated 11.70 bln kWh of power by means of hydrogenation SES. The main production volume is accounted for by the PAO TGK-1 hydroelectric power plants that contributes significantly to the green energy of the North-West Federal District of Russia.

In 2019, the Gazprom Group used 2,240 power plants based on SES and RES (excluding hydro units), such as turboexpanders, thermoelectric generators, solar modules and batteries, wind turbines. The total volume of electricity generated by these power plants totaled 686.25 thousand kWh.

Indicators of renewable and secondary energy sources use in PJSC Gazprom, 2015–2019



In 2019, the construction of a solar power plant with a capacity of 1MW (1st project phase) at the Omsk oil refinery of PAO Gazprom Neft was completed. The new station covers an area of 2.5 ha and consists of 2.5 thousand solar panels manufactured by the Russian company Hevel. This investment project is unique for the Russian industry in terms of adoption of green technologies and is part of the large-scale program of the Omsk refinery development.

Indicators of power generation from renewable and secondary energy sources in the Gazprom Group, 2017–2019

	Electricity generation, kWh			Number of units, pcs.		
Generation type	**2017**	**2018**	**2019**	**2017**	**2018**	**2019**
All types of RES and SES	13,723,908,386.0	12,844,199,280.1	11,703,054,790.2	2,077	2,272	2,358
Including PJSC Gazprom	362,391.6	459,666.3	557,958.2	1,423	1,555	1,585
Turbo expanders	143,915.5	93,165.0	74,679.0	20	17	21
Including PJSC Gazprom	143,915.5	93,165.0	74,679.0	20	17	21
Thermoelectric and electrochemical generators	2,670.0	6,438.8	257,431.7	719	726	820
Including PJSC Gazprom	2,670.0	6,438.8	257,431.7	719	726	820
Solar and wind generators	324,887.5	483,060.3	354,136.5	1,220	1,411	1,399
Including PJSC Gazprom	215,806.1	360,062.5	225,847.5	684	812	744
Hydro turbines	13,723,436,913.0	12,843,616,616.0	11,702 368,543.0	118	118	118
Including Gazprom energoholding	13,685,902,140.0	12,819,013,716.0	11,673,658,262.0	115	115	115
Gazprom neftekhim Salavat	37,534,773.0	24,602,900.0	28,710,281.0	3	3	3

Scientific and technical support of environmental protection

Innovative research and development

Enhancement of operating efficiency of the Gazprom Group companies is achieved through scientific research, development and adoption of new technologies mitigating negative impact on the environment.

In 2019, the Gazprom Group completed R&D environmental protection works priced at RUB 288.37 mln, including the efforts pursued by corporate scientific research institutes — OOO Gazprom VNIIGAZ and OOO NIIgazekonomika.

In 2019, the following research projects were carried out: "Development of technologies and reagents for rectification of hydrocarbon contamination consequences in coastland and coastline in the course of offshore field development" and "Development of surface-active agent to localize hydrocarbon contaminations on water plane".

Due to expansion of hydrocarbon fields development in north regions, including offshore, invention of powerful hydrocarbon spill response measures becomes a topical issue. Comprehensive method for water surface treatment from hydrocarbon contaminations by the hydrocarbon collecting surfactant SOBIRATEL developed by OOO Gazprom VNIIGAZ as well as by remote laser combustion will provide for fast and effective environmental protection measures in oil spill response.

Efficient response, possibility of application in hard-to-reach places, high purification efficiency (up to 91%), possibility of advanced treatment by microbiological methods, absence of wastes that require recovery are positive features of this comprehensive technology of water treatment from hydrocarbon contaminations.

Corporate science has developed and now applies treatment technologies for waters and soils contaminated by oil and gas, which result in 85% reduction of oil products concentration with carbon dioxide and water as end products.

Development of the system of selective catalytic reduction of nitrogen oxides in GCU exhaust gases is underway. Application of this system as a part of GCU is in line with up-to-date trends of gas pumping equipment advancement and complies with environmental requirements. With the help of selective catalytic reduction any operating or new GCU can be upgraded within 6 months to ensure compliance with the EU's emission standards. In combination with dry low emission technology the system keeps the lower level of European environmental standards on nitrogen oxides (NO_x) — 20 mg/m^3.

Amid decarbonization trend, acquisition of unbiased and reliable data on carbon footprint of products, in particular natural gas, must become a winning argument for natural gas to achieve competitive technological advantage at the stage of transition to low carbon energy. OOO Gazprom VNIIGAZ tested evaluation model for carbon footprint along different natural gas transmission routes and GHG carbon intensity in a life cycle, as well as carbon footprint for different fuel types (CNG, diesel, petrol). Procedure and recommendations for verification of GHG emissions volume and ISO 14064 conformance certification of the Company's GHG emissions management system have been developed. Climate change models have been evaluated along with natural gas role in climate change.

Institutes of the Russian Academy of Sciences (RAS) are actively involved in addressing Gazprom's challenges. For example, Institute of Environmental Geoscience of RAS proposed adaptation technology to ensure safety of process facilities in case of changing geocryological conditions.

As for energy-saving, the following R&D works have been performed:

- Implementation analysis of energy-saving measures, technical potential of energy-saving and enhancement of efficiency of the main business processes of PJSC Gazprom. Drafting of proposals on adjustment of the current PJSC Gazprom's Energy-Saving Program;
- Estimation of energy-saving potential in the Company's main business activities and drafting proposals on formulation of PJSC Gazprom Energy-Saving and Energy Efficiency Improvement Concept for 2021–2030;
- Development of feasibility study and technical requirements for mobile unit of vented gas recovery from gas compressor units (GCU) circuit and compressor shop.

OOO NIIgazekonomika performed the following legislative, environmental and economic regulation studies:

- Formulation of proposals on PJSC Gazprom measures to comply with the environmental requirements of credit and investment institutions;
- Benchmarking of PJSC Gazprom's competitors (including foreign) in environment and energy performance;
- Economic impact assessment of environmental law amendments for PJSC Gazprom;
- Study of environmental and economic effect from implementation of technical solutions in design documentation.

Use of the best available techniques

PJSC Gazprom Innovative Development Program up to 2025 is mainly driven by constant advancement of the Company's technical level and maintaining technological leadership in the global energy business. The Program envisages active cooperation with corporate and external scientific organizations within the scope of R&D works, state development institutions, higher educational establishments on organization of joint research and personnel training.

Environmental safety and energy performance of the Gazprom Group operating activities are improved mainly through adoption of innovative technical and technological solutions.

Transition of PJSC Gazprom to the best available techniques is done through development and approval of the BAT Roadmap.

The Company's subsidiaries that operate the 1st category facilities exerting negative impact on the environment performed assessment of applied technologies conformance to BAT indicators defined by ITS (BREF) 29-2017 Natural Gas Production" and ITS (BREF) 50-2017 Processing of Natural and Associated Gas.

PJSC Gazprom (OOO Gazprom energo) was among the first companies in Russia that in 2019 obtained Complex Environmental Permit for thermal waste recovery unit at the Chayandinskoye OGCF within the scope of the federal project "Adoption of the best available techniques" of the National Ecology Project.

PJSC Gazprom developed some corporate regulatory documents in 2019.

— STO Gazprom 12-2.1-024-2019 Regulatory environmental protection documents. Gas supply systems. Operational environmental control. Main requirements.
The Standard has been prepared to prescribe requirements for performance and technical support of measurements of atmospheric pollutant emissions, discharge of contaminants into water bodies, waste management, and state parameters of environmental components in PJSC Gazprom's facilities impact area in the course of OEM. The document has been developed with due account of BAT legislation requirements and includes information on marker substances that define applied technologies and industrial process specifics at the facility, as well as data on automated control systems.

— R Gazprom 12-2.1-025-2019 Regulatory environmental protection documents. Gas supply systems. Methodical recommendations for drawing up Complex Environmental Permits.
Recommendations have been developed to ensure fulfillment of the requirements of the Federal Law on Environmental protection as of the 10th of January 2002 on obtaining Complex Environmental Permits when passing to technological rating of PJSC Gazprom facilities exerting negative environmental impact. Recommendations also define the structure of the Request for Complex Environmental Permit and provisions for its compilation for PJSC Gazprom facilities.

PJSC Gazprom's Science and Technology Prize

PJSC Gazprom's science and technology prize is awarded annually since 1998. It is an important constituent of the corporate R&D policy of Gazprom aimed at promoting innovations and securing the Company's technological leadership in the global energy business.

The Prize is awarded for remarkable projects in natural gas production, transmission, processing and utilization that culminated in development or advancement and most importantly effective application of new equipment, tools, materials and technologies.

As a rule, the majority of R&D projects nominated for the Prize have direct or indirect environmental effect.

In 2019, 17 projects from 26 Gazprom's subsidiaries and 6 external organizations prepared by 148 authors were nominated for the Prize.

Adoption of developments that awarded the Prize resulted in general cost advantage exceeding RUB 60 bln.

Submitted works were reviewed by the expert group represented by specialists from PJSC Gazprom and its subsidiaries. Experts evaluated projects relevance, novelty, scientific and technical level (research intensity), scope and scale of application, as well as financial viability of their use at PJSC Gazprom. In 2019, the following projects were among the Prize winners:

Developing and integrating information & management systems to improve technogenic and geo-ecological safety at gas production facilities of OOO Gazprom dobycha Yamburg

Nominee — OOO Gazprom dobycha Yamburg.

The authors met the challenge of upgrading IMS of gas industry facilities to improve their adaptability to specific conditions of the Russian Far North and maximizing the use of the Russian software.

A set of innovative measures developed by the authors mitigates risks associated with man-caused, environmental and geoecological accidents with the help of the IMS of gas industry facilities.

The developments are protected by 19 patents; 23 works have been published, including two monographs.

Reduction in the consumption of reagents for process needs and lowering gas losses during blowdown of gas well clusters are factors that confirm efficiency of the work done.

Development of production method and composition of hydrocarbon base of Gazpromneft Drilline drill fluid

Nominee — PAO Gazprom Neft.

The authors addressed a relevant issue of substituting import base oils with low kinematic viscosity used as hydrocarbon-base solutions in horizontal well drilling by competitive home-manufactured oils.

The authors developed and introduced a method to produce low-viscous base oils.

In terms of aromatics content, the quality of developed Gazpromneft Drilline products is better than the quality of Russian equivalents. The product is also highly competitive with foreign oils and demonstrates even better fire safety (higher flash point) and low chilling point.

The development is protected by the patent.

Lower cost of Gazpromneft Drilline products as compared to foreign products is a factor that confirms efficiency of the work done.

Information & Analysis System for forecast of stress corrosion cracking accident-prone sections of GTL and overhaul repair scheduling exemplified by OOO Gazprom transgaz Yugorsk

Nominee — OOO Gazprom gaznadzor.

The authors addressed a vital issue of forecast identification of stress corrosion cracking accident-prone sections of gas trunklines and overhaul repair scheduling.

The authors developed methodological basis introduced into Information & Analysis System to minimize accidents at trunkline sections of OOO Gazprom transgaz Yugorsk caused by stress corrosion cracking and to increase accuracy in planning the volume of pipes that require replacement in the course of overhaul repair.

Cost advantage of this project is reduction in repair expenditures at OOO Gazprom transgaz Yugorsk LS of GTL subject to stress corrosion cracking.

International cooperation

International environmental and energy performance cooperation is an integral part of PJSC Gazprom's activities in pursuing sustainable development targets.

Information on nature protection activities of PJSC Gazprom and the role of natural gas in low carbon development was presented at many international events, including focus meetings with investors and road show with the participation of the independent director of PJSC Gazprom.

"Natural Gas — Paving the Way to an Ecological Economy" was declared a key topic for the 22nd annual General Meeting of the International Business Congress (IBC) held on the 30–31 May 2019 in Bonn (Germany). Environmental advantages of natural gas were discussed at the sessions of dedicated IBC committees "Industry, Innovations and Prospective Development", "Ecology and Healthcare" and "Energy".

New natural gas market opportunities with account of low carbon trend of the global economy were discussed at events organized by the International Gas Union (IGU), at the task force sessions "Long-term strategy in environment-conscious market" and "Supporting hydrogen economy".

PJSC Gazprom representatives delivered reports on natural gas potential to meet climate goals at the following focus events: the 12th Russian-German Resource Forum, Energy Dialogue at the Reichstag, Session of the UNECE Committee on Sustainable Energy, Workshop of the International Energy Agency.

PJSC Gazprom experience in low carbon development and possible contribution of natural gas into EU Green Deal have been addressed at events held by the Global Gas Centre: round tables The Role of Natural Gas and its Interaction with Renewables (Berlin, Germany) and The Role of CCS and Hydrogen from Natural Gas in Decarbonisation (Bergen, Norway).

PJSC Gazprom activities on hydrogen technologies were represented at sessions of the Work Stream "Internal markets" of Russia-EU Gas Advisory Council, at the French Gas Association Conference "Hydrogen and Natural Gas — the Way towards Low Carbon Economy", at the International Partner Meeting of the Energy Delta Institute "Hydrogen — a Paradigm Shift in the Energy Sector, the Future?", session of the Group "Economy, Trade and Resources" of the Russia — Republic of Korea Dialogue, and at other events. The year 2019 saw negotiations with international companies and parties interested in hydrogen, including the meetings under the scope of R&D cooperation programs with VNG, UNIPER, Wintershall Dea, N.V. Nederlandse Gasunie, Engie, Shell, Linde and BASF.

The companies' scientific and technological cooperation in 2019 on environmental aspects of PJSC Gazprom's activities could serve as an impressive example of how much companies can achieve if they are willing to engage in meaningful dialogue and follow the principles of equal and mutually beneficial partnership. Series of meetings with foreign partners aimed at relevant joint environmental and energy efficiency studies have been held within the scope of sci-tech cooperation programs.

Scientific and technical cooperation (STC) program between PJSC Gazprom and N.V. Nederlandse Gasunie for 2019–2021 comprises technical dialogue "Improvement of energy efficiency and reduction of greenhouse gas emissions at gas transmission and storage facilities". At the beginning of the year, the parties initiated comparative analysis of specific methane emissions during natural gas transmission and assured participation in the climate initiative The Guiding Principles on Reducing Methane Emissions across the Natural Gas Value Chain.

The year 2019 evidenced continuation of teamwork between PJSC Gazprom and OMV Aktiengesellschaft under the scope of different technical dialogues.

February 2019 saw the session of the working group "Environmental hydrocarbon pollution clean-up operations using chemical and biological methods". After discussion of laboratory tests performed at OOO Gazprom VNIIGAZ to treat hydrocarbons-polluted soils by in-house bioagent according to the test program preliminary agreed with OMV, the parties arrived at the decision to proceed with the studies to fine tune effective application of bioagent to decontaminate soils from hydrocarbons at one of OMV facilities.

June 2019 saw announcement of the results of the work done and plans for the future of the working group "Energy-saving and environmental protection" under the STC and Partnership Program between PJSC Gazprom and OMV. Under the scope of the technical dialogue "Ensuring environmental safety of oil and gas facilities by BAT utilization", in September 2019 OMV central office in Vienna (Austria) hosted the OMV — Gazprom Workshop on the use of BAT and BREFs in the oil and gas industry. This event was participated not only by representatives of OMV and PJSC Gazprom, but also by Gazprom's subsidiaries and members of the International Association of Oil and Gas Producers.

Application of biological technologies for rehabilitation of natural environments revives keen interest among oil and gas companies. According to the STC Program between PJSC Gazprom and China National Petroleum Corporation (CNPC) for 2018–2020 and with the aim to implement the technical dialogue "Set of measures to treat natural environment from hydrocarbon contaminations by chemical and biological methods (technical cooperation on liquidation of hydrocarbon contaminations by chemical and biotechnological methods)", September 2019 saw signing of the Agreement on organization and technical support to determine efficiency of soil treatment from hydrocarbons by bioagent under natural conditions at one of the industrial sites of Huabei oil and gas producing company (PetroChina Co. Ltd) located in the People's Republic of China.

Apart from these areas, PJSC Gazprom actively participates in the development of new environmental standards of the International Standardization Organization (ISO). November 2019, OOO Gazprom VNIIGAZ hosted the 8th Plenary Session of ISO/TC67/PC8 Arctic operations, which reviewed suggestions on the development of international standards "Petroleum and gas industries — Arctic operations — Oil spill response and localization" and "Petroleum and gas industries — Arctic operations — Operating environment — Control".

The results of PJSC Gazprom international work in 2019 to forge effective and mutually beneficial cooperation opened up opportunities for further progress and expanded scientific and technical capacities of the Company based on a wide range of up-to-date environmental and technological solutions.

Information disclosure

Information disclosure and environmental safety transparency is a keystone of Gazprom Group operating principles.

Information disclosure performance criteria comprise: data reliability, timely presentation, regularity and credibility, its availability for state authorities, shareholders and investors, the public, mass media and other interested parties.

PJSC Gazprom official web-site www.gazprom.ru provides information on environmental aspects of Gazprom Group activities in tabs “Environment” and “Media”. Tab “Investors” provides data on gas supplies, financial statements, sustainable development reporting, consolidated financial reporting according to IFRS, quarterly reporting, accounting statements, environmental reports.

Information on the current and future environmental and energy performance activities of Gazprom is constantly published in corporate magazines “Gazprom” and “Gas industry”, in newspapers and other periodicals of the Gazprom Group subsidiaries, such as “Puls Aksarayska” (OOO Gazprom dobycha Astrakhan), “Prometey” (OOO Gazprom transgaz Moskva), “Gazovy forpost” (OOO Gazprom transgaz Stavropol), “Pererabotka” (OOO Gazprom pererabotka), “Sibirskaya neft” (PAO Gazprom Neft).

PJSC Gazprom’s participation in climate and water CDP programs (previously -Carbon Disclosure Project) on information disclosure allows for demonstrating the corporate strategy on GHG emissions and water resource management to the global financial institutions and investors that consider this information while constructing investment portfolios.

Since 1995, PJSC Gazprom Environmental Report has been issued on an annual basis. Since 2010, PJSC Gazprom Sustainable Development Report has been published on a regular basis. Its sections “Rational use of resources” and “Environmental impact” provide detailed information on the strategy and tactics of rational use of natural resources, environmental protection, climate change, and cooperation with interested parties.

Following the information transparency principle, the Gazprom Group companies publish on their web-sites Environmental Policy guidelines, environmental news, environmental and sustainability reports, biological diversity preservation action plans, environmental monitoring reports, environmental impact assessment, information on public hearings on projects, oil spill response plans, and other content.

PJSC Gazprom holds public hearings for the majority of investment activities on an annual basis as it is compulsory according to the Russian legislation.

Gazprom Group Management commitment to information disclosure is confirmed by annual meetings with representatives of federal and regional mass media, which discuss rational use of natural resources, environmental protection and energy-saving.

Gazprom monitors mass media to analyze public opinion on its environmental activities and further consider it for future planning and prompt managerial decision-making. The year 2019 saw 10,657 positive publications in mass media and Internet associated with environmental aspects of Gazprom Group activities.

Efficiency of corporate policy in this sphere is confirmed by independent experts.

In December 2019, PJSC Gazprom once again joined the leader ranks on indexes “Responsibility and transparency” and “Sustainable development vector”, which are based on analysis of the public corporate reporting of the companies which rank among Top 100 of the largest companies according to RAEX-600 and RBC-500 ratings.

PJSC Gazprom’s achievement of top ranks in sustainable development, corporate responsibility and reporting is an evidence of the Company’s advancement in information disclosure and transparency.

Sakhalin Energy company moved to the fore of the environmental responsibility rating among oil and gas companies (the project is implemented by CREON Group and WWF Russia) and achieved strong performance in three areas: "Environmental management", "Environmental impact" and "Information disclosure".

OOO Gazprom VNIIGAZ hosted the VI International Conference "Environmental Safety in Gas Industry" (ESGI-2019) on 3–4 December attended by 176 outstanding specialists from 94 companies and 7 countries. Plenary session with 15 presentations delivered addressed topical issues of natural gas role in sustainable development and transition to low-carbon energy, current and future studies on environmental safety and energy efficiency, development of nature-like technologies, responding to new environmental legislation requirements and application of the best available techniques. The Conference panel sessions comprised 34 reports on the following topics: environmental regulation (types, problems, solutions); enhancement of energy performance as a factor of technological development; innovations in addressing environmental challenges; climate risks and low-carbon economy as modern trends of the industry. Keen interest to nature-like technologies was met by a round table "Microbial biotechnologies for the oil and gas industry".

Gazprom's efforts in improving environmental situation in the regions of its presence were recognized by a large number of awards, certificates of merits, diplomas, letters of appreciation from federal, regional and local authorities, educational institutions and public organizations.

In September 2019, Novourengoysky Museum of Fine Arts presented photobook "Yamal Reserve. Startling Gydan". The edition included around 500 photos made during expedition to the State Nature Reserve Gydansky in 2016. The project was initiated by OOO Gazprom dobycha Yamburg and supported by the Vernadsky Non-governmental Environmental Foundation. The book introduces unknown chapters of the history of the Arctic North, unique landscapes, inhabitants of these remote territories, many of which are listed in the Red Book (Red List of Threatened Species of Russia).

June 2019 saw presentation of the book "Exciting Ecology or Boomerang Effect" in Moscow. The edition was issued under financial support of OOO Gazprom transgaz Ukhta. The book is well suited to general readers interested in ecology. The project actualizes a timely request for environmental education of the younger generation and helps the Russians to understand significance of the ecological culture and personal responsibility for the Earth's future.

Conservation of biodiversity and voluntary environmental responsibility

Compliance with the Russian and international environmental norms and requirements, mitigation of the negative impact on the environment and taking any and all measures to preserve biodiversity and compensate possible damage to the environment are the keystones of the Environmental Policy that the Gazprom Group companies strictly adhere to.

Gazprom's concern about conservation of biodiversity, habitats of rare and threatened plants and animals is an important chain link in the Company's environmental activities. Prevention of the negative impact on offshore and onshore ecosystems is an initial condition for commencement of Gazprom's projects.

Implementing the hardest oil and gas production projects, Gazprom entirely recognizes its responsibility for maintaining environmental balance. Gazprom applies up-to-date technological solutions to minimize the influence of industrial activities on nature, performs constant environmental monitoring, implements biodiversity preservation programs both in the zone of Company's responsibility, and in other regions of Russia.

In 2019, RUB 451.55 mln were spent on biodiversity and nature territories preservation, fisheries protection and reproduction.

In 2019, Gazprom's subsidiaries carried out a large amount of environmental projects oriented at the replenishment of bioresources and fisheries recruitment, including valuable fish.

Over 26 mln species of different fish, including valuable ones, were released into waters in 2019.

Over 1.5 mln graylings, Pacific salmons and Russian sturgeons juvenile fish were released into commercial water bodies in Irkutsk, Sakhalin and Tyumen regions. Over 580 thousand juvenile fish were released into Krasnoyarsk rivers, over 90 thousand Russian sturgeons — into Ob-Irtysh basin rivers, over 38 thousand peleds — into the Aannyaakh river of Vilyujskoye water reservoir, over 111 thousand of peleds and graylings, 27 thousand of sterlets — into the Belaya river in Usolsky region.

As part of the regional bioreserve reproduction program, the Company released over 170 thousand of carps juvenile fish into the Zeya river, 118 thousand young-of-the-year carps — into Bolshoy Milashevsky basin in Slavyansky region of the Krasnodar Territory.

Under the scope of the Preservation of Siberian Sturgeon project, the first 2 thousand sturgeon juvenile fish were released into the Irtysh river in the Khanty-Mansiysk Autonomous District, which commemorated a substantial part of the XVII International Environmental Campaign "To save and preserve".

Biodiversity at north latitudes at Company's operation areas is preserved through bird protection systems, polymer protection systems at suspension insulators; traverse bars, where insulators are installed, are grounded.

Polar bear, the biggest predator on the Earth, requires exceptional protection. To fence specialists working on the Kharasaveyskoye gas condensate field from the visits of polar bears, safe protection systems and gears are used.

Since 2004, Sakhalin Energy has been studying the population of Steller's sea eagle in the area of its production activities, and from the beginning of construction takes measures to protect it. During nesting of predatory birds and nestlers training, buffer zones are created, where operations, traffic and repair works are prohibited.

Helicopter routes are mapped in the way to exclude impact on nesting areas. Populations are saved also through biotechnical measures suggested by scientists, including development of roost sites, and protecting nest trees. To control and evaluate efficiency of measures, new monitoring results are compared with data of previous years and with equivalent values of the control zone located outside the impact area of industrial facilities.

The Program on monitoring of grey whale population has been implemented in Sakhalin Energy since 2002. In 2018, it was joined by OOO Gazpromneft-Sakhalin. At the beginning of offshore facilities construction, Sakhalin Energy took into consideration that for summer graze grey whales use areas adjacent to its hydrocarbon field. It was the reason for laying offshore pipeline route 30km further bypassing areas with high concentration of giant mammals not to disturb them. In mid 80's of the last century around twenty grey whales were detected that according to scientists opinion pertain to endangered Okhotsk-Korean (West) population. Now and by virtue of human-induced disturbance mitigation, over 300 species are living at the territory of Sakhalin Energy presence. On the basis of longstanding monitoring data, the International Union for Conservation of Nature changed the status of grey whales west subpopulation in the Red List from critically endangered (CR) to endangered (EN).

To protect animals and perform works in a safe manner a set of measures is undertaken, such as establishment of routes and ship speed restriction, determination of safe distances towards marine mammals and obligatory supervision by observers onboard to mitigate risks of possible collision.

PAO Gazprom Neft successfully completed the first expedition of the project "Narwhal. Legend of Arctic". This environmental project of the large-scale Arctic Time Program allowed to evaluate the status of narwhal population in the west sector of the Arctic zone of Russia, determine the number of specimens in the population and its distribution borders, as well as to formulate the program to preserve the population and its habitats. Up to the present, comprehensive studies of these specimens have not been carried out. New data obtained during expedition will help to draw up a program of further studies of narwhals and their habitats in polar latitudes.

The end of November 2019 in Moscow saw awarding ceremony of the International Ecological Award "EcoWorld" founded by the Russian Academy of Natural Sciences. OOO Gazprom transgaz Stavropol won the first prize in nomination "Environmental education, training and culture". The company presented unique environmental project of the virtual 3D tour in the Strizhament state natural reserve located in the vicinity of Stavropol. This project has been first of all developed for people with disabilities who cannot visit the natural reserve by themselves to see its rich biodiversity.

Over a number of years PJSC Gazprom undertakes large-scale nature protection measures in areas of its presence by advancing mechanisms of voluntary environmental responsibility. These measures comprise organization of contests, workshops, meetings on environmental topics, volunteer clean-ups, environmental campaigns. Such projects are oriented at development of ecological culture, education, training, and creating reputation of green and socially responsible company.

To maintain a well-established tradition, all Group companies together with the Vernadsky Non-Governmental Ecological Foundation took part in the VI All-Russian environmental clean-up day "Green Spring – 2019" in April – May 2019. This federal ecological marathon in different regions of Russia was participated by over 35 companies and organizations of PJSC Gazprom.

More than 1,700 specialists of OOO Gazprom dobycha Astrakhan were among the first to join this notional public campaign. Astrakhan gas workers exerted their efforts in Astrakhan and in the Krasnoyarsky and Privolzhsky districts. Extensive work has been done in the Krasnodar territory: in the Sanatory Yug health centre and near the monument to the soldiers of the Great Patriotic War in Sovet-Kvadzhe neighbourhood. More than 200 osiers, ashtrees and hybrid poplar trees were planted. 40 social infrastructure facilities have been fixed up, 500 hardscapes have been reconstructed and repaired. Apple garden in the Krasnoyarsky district traditionally became the main place of OOO Gazprom dobycha Astrakhan's endeavour. Young specialists of the company have been supervising this pivotal environmental zone for the last seven years. Around 1.5 thousand trees have been pruned, landscaping of the territory adjacent to an apple garden have been performed, including rubbish disposal, painting of fences and facilities. During the clean-up day, 23 special vehicles were used, and 77 tons of rubbish was taken to landfill sites.

The staff of OOO Gazprom dobycha Nadym participated in the All-Russian Environmental Clean-up Day "Green spring — 2019" for the sixth year in a row. Efforts of 867 company's specialists helped to clean territories adjacent to production and administration buildings in Nadym and Pangoda township; 25 cars took out different types of wastes with a total volume of 153 m^3; 362 young plants were transplanted.

OOO Gazprom dobycha Urengoy joined Green spring — 2019 by cleaning its production facilities and adjacent territories.

Around 2,500 workers of OOO Gazprom transgaz Saratov participated in this environmental campaign. They performed landscaping and sanitation of industrial territories in Saratovskaya, Penzenskaya, Tambovskaya regions, as well as places of residence and resort of gas workers, city and township residents. The Company's workers cleaned and landscaped parks and public gardens, forest zones, unkept and abandoned memorable, cultural and historical places; repaired 10 playgrounds. Clean-up days and environmental campaigns ended up with taking out over 900 m^3 of rubbish and cleaning of around 80 ha of land. More than 10,000 plants and 100 plantlets were transplanted.

The natural park "Kumysnaya polyana" in Saratov hosted a closing event under the scope of the All-Russian Environmental Clean-up Day. Within several hours around 80 participants collected and took out four trucks of rubbish, dead branches and leaves.

OOO Gazprom transgaz Stavropol organized dozens of environmental campaigns within the scope of this All-Russian Clean-up Day "Green spring — 2019". This EcoDay comprised seven territorial entities of the Russian South, where industrial and social facilities of the gas transmission company are allocated. The Green spring — 2019 was joined by 2,300 company's workers, pupils, students, and volunteers from regional public associations and organizations. Gas workers cleaned 60 ha of lands, collected 90 tons of rubbish, planted 360 trees and made 30 new flower gardens under the scope of the federal eco campaign. Municipal parks and gardens, industrial facilities, playgrounds, resting places, seven regional water bodies were cleaned up. Clean-up Day took place on the shore of Novotroitskoye water reservoir, the Terek, the Serebryanaya Volozhka and the Medvedka rivers. Much attention was paid to gardening and landscaping. Ecological quests and quizzes with pre-schoolers and pupils, children drawing contest, open eco lessons devoted to the World Environmental Day, bike rides, waste paper collection campaigns became landmark events of "Green spring – 2019".

OOO Gazprom transgaz Tomsk implemented 99 ecological initiatives. Campaigns under the aegis of the Green Spring — 2019 were participated by over 2,000 workers. The All-Russian Environmental Clean-up Day covered all 14 regions of the company's activities. Towns of Barabinsk (Novosibirsk region) and Yuzhno-Sakhalinsk saw landscaping of recreation parks, the Khabarovsk Territory — release of chum salmon juveniles into the Gur river, employees of Yurginskoye local operations & maintenance department made bird feeders. Primorsky local operations & maintenance department continued their work on construction of the Walk of Fame of gas workers in tree nursery of the Gornotayozhnaya station. Over 200 ha of lands have been cleaned, around 130 tons of rubbish have been collected, and over 20 thousand of nursery trees have been transplanted. Organizers, the Vernadsky Non-Governmental Ecological Foundation and the All-Russian Environmental Protection Society awarded the company with diploma and a cup for active participation, initiative and significant contribution to environmental protection.

OOO Gazprom transgaz Ukhta takes part in the Green Spring on the annual basis. In 2019, over 1,300 people from 22 branch offices and administration of the Company joined Ecological Clean-up Day in the Komi Republic, Arkhangelsk, Vologda and Yaroslavl regions. This campaign resulted in collection and further disposal of around 1,025 m^3 wastes, and trees planting. A total area of 125.7 ha was cleaned and landscaped, unauthorized landfill sites were cleaned up. Planting of greenery was done in populated areas in areas of the company's activities: 30 pine trees were planted in Nyuksenitsa township, 25 pine trees in the town of Gryazovets, 7,000 European Spruce seedlings in in Yaroslavl region close to Kulakovo village.

OOO Gazprom transgaz Chaikovsky carried out clean-up days in the town of Chaikovsky under the aegis of the All-Russian Environmental Clean-up Day "Green Spring — 2019": rubbish and deadwood were collected, paving roads were cleaned, benches and dustbin towers were painted. Cleaning and landscaping of municipal territories was done by 442 workers, who collected 23 tones of rubbish over the area of 40 ha.

Within the scope of "Green Spring — 2019", employees of OOO Gazprom transgaz Ufa, members of their families and veterans of the Company planted the Labor Walk of Fame, landscaped the Victory Park in the township Moskovo. Gas transmission workers planted hundreds of seedlings of spruce, pines, birch and other trees in Bashkortostan and its regions.

PJSC Gazprom activities in go-green production, voluntary environmental initiatives are annually distinguished by public organizations, local and regional authorities.

Glossary of main terms and abbreviations

APG	associated petroleum gas. Mixture of gases and vaporous hydrocarbon and non-hydrocarbon components emitted from oil wells and oil-in-place in the process of its separation.
BAT	best available technique.
BCS	booster compression station.
Biodiversity (biological diversity)	the whole variety of living forms of different habitats, including onshore, offshore and other water ecosystems and their constituent ecological complexes.
BREF	BAT reference document.
CGTU	comprehensive gas treatment unit.
CNG	compressed natural gas.
Conservation area	tract of land, water and air above them with natural complexes and objects that have been awarded a special protected status to ensure that natural features, scientific, cultural, esthetical and recreation heritage are safeguarded. By the decision of state authorities these areas are totally or partially removed from economic use. Conservation areas pertain to nationwide treasure.
CS	compressor station.
EF	efficiency factor.
EMS	Environmental Management System.
EnMS	Energy Management System.
Energy-saving	implementation of legal, organizational, scientific, production, technical and economic measures aimed at effective (rational) use of fuel and energy resources and introduction of renewable power sources into economic turnover. Energy-saving is a critical mission in preserving natural resources.
Environment	set of nature components, natural-anthropogenic as well as man-made objects.
Environmental audit	independent comprehensive documented assessment of compliance of the economic or other entity with environmental requirements, standards, regulatory documents and international standards, drawing up recommendations to improve entity's activities.
Environmental damage	negative change in the environment caused by pollution, which entailed degradation of natural ecological systems and depletion of natural resources.
Environmental impact assessment	type of activity aimed at identification, analysis and accounting of direct, indirect and other consequences to the environment from planned business and other operations to make a decision on possibility or impossibility of their implementation.
Environmental management	part of the general corporate management system with a clear organizational structure aimed at reaching Environmental Policy provisions by implementation of environmental protection programs.
Environmental monitoring	comprehensive system of observations over environmental state, estimation and forecast of environmental conditions changes under the impact of natural and man-made factors.
Environmental protection	measures aimed at preservation and recovery of the environment, rational use and reproduction of natural resources, prevention of negative environmental impact of business and other activities and consequences management.
Environmental protection requirements	obligatory conditions, restrictions or their combination applicable to business and other activities stipulated by environmental laws, statutes, regulations, federal norms and rules, as well as other environmental regulatory documents.
Environmental review	inspection of documents and (or) documentation that substantiate planned business and other activities for their conformance to environmental requirements, existing technical regulations and legislation to prevent negative impact of such activities on the environment.
Environmental safety	security of the environment and vital human interests from possible negative impact of business and other activities, natural and man-made emergencies and their consequences.
Environmental supervision	system of measures aimed at prevention, identification and restraint of environmental legislative violations, ensuring compliance of economic and other entities with requirements, standards and regulatory documents in the sphere of environmental protection.
Environmental quality	state of the environment characterized by physical, chemical, biological and other values and (or) their combination.
EU	European Union.
GCU	gas compressor unit.
GDS	gas distribution station.
Greenhouse gases (GHG)	gases that presumably cause global greenhouse effect. The main greenhouse gases in order of their estimated contribution into the Earth's heat balance are water steam, carbon dioxide, methane, nitrogen, sulphurylfluoride, halocarbons and nitrogen oxide.
GTL	gas trunkline.

Global Temperature change Potential (GTP)	an index measuring the change in global mean surface temperature at a chosen point in time following an emission of a unit mass of a given substance, relative to that of the reference substance, carbon dioxide.
GTS	gas transmission system.
IMS	Information and Management System.
LNG	liquefied natural gas.
LS	linear section.
Natural complex	a set of natural objects functionally and naturally related to each other and incorporated by geographical and other corresponding features.
Natural object	natural ecological system, natural landscape and their constituent elements that preserved natural features.
Natural resources	nature components, natural objects and nature and man-made objects that are used or can be used in the course of business and other activities as energy sources, products and consumables, and that have consumer value.
Negative environmental impact	impact of economic and other activities, which consequences lead to adverse changes in the environmental quality.
OEC	Operational Environmental Control.
OEM	Operational Environmental Monitoring.
OGCF	oil gas condensate field.
Pollutant	substance or mixture of substances that occur in amounts and (or) concentrations exceeding specified limits for exposure to chemicals, including radioactive and other substances and microorganisms, and generate a negative impact on the environment.
R&D	research and development works.
SES	secondary energy sources.
STC	scientific and technical cooperation.
TPES	total primary energy supply
UGS	underground gas storage.
UGSS	Unified Gas Supply System.
Waste management	activities on collection, accumulation, transportation, processing, recovery, treatment, disposal of waste.

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Independent Practitioner’s Limited Assurance Report on the information on direct and indirect energy greenhouse gas emissions from the main activities of PJSC Gazprom (production, transmission, processing and underground gas storage) and other indirect emissions of Gazprom Group in 2019

To the Management of PJSC Gazprom

Introduction

We were engaged by the Management of PJSC Gazprom (hereinafter – the “Management”) to undertake a limited assurance engagement on the information on direct and indirect energy greenhouse gas emissions from the main activities of PJSC Gazprom (production, transmission, processing and underground gas storage) and other indirect greenhouse gas emissions of Gazprom Group in 2019 (hereinafter – the “information on GHG emissions”) with a conclusion providing limited assurance that nothing has come to our attention that causes us to believe that the Management`s Statement that the information on GHG emissions is prepared, in all material respects, in accordance with the applicable criteria (set out below in “Applicable Criteria” section of this report) and is free from material misstatement, is not fairly stated.

The information on GHG emissions from the main activities is presented in the table “Greenhouse gas emissions dynamics at PJSC Gazprom by types of activities, 2015–2019, mln tons of CO_2e”, table “Methane emissions at PJSC Gazprom by types of activities, 2019, mln tons of CO_2e”, table “Indirect energy greenhouse gas emissions at PJSC Gazprom by types of activities, 2019, CO_2e” and table “Volume of GHG emissions under Scope 3 for Gazprom Group in 2019" in section “Greenhouse gas emissions” of PJSC Gazprom’s Environmental Report 2019 (hereinafter – the "Report"). Our conclusion does not apply to any other information provided in the Report.

Management’s Responsibility

Management is responsible for the preparation of the information on GHG emissions in accordance with the applicable criteria (set out below in section “Applicable Criteria” section of this report) and for all information contained therein.

This responsibility includes designing, implementing and maintaining the system of internal control relevant to the preparation of the information on GHG emissions that is free from material misstatement, whether due to fraud or error. This responsibility also includes: selecting the applicable criteria; selecting and applying relevant GHG

quantification methodologies and GHG reporting policies; preventing and detecting fraud; identification of and compliance with legal requirements applicable to PJSC Gazprom; developing assumptions and estimates, which are reasonable in the current circumstances; maintaining sufficient documentation in relation to the information on GHG emissions.

Our Responsibilities and Applicable Standards

Our responsibility is to express a conclusion on the Management's Statement on the information on GHG emissions based on procedures performed and evidence obtained. We conducted our limited assurance engagement in accordance with International Standard on Assurance Engagements 3410 *Assurance Engagements on Greenhouse Gas Statements*, issued by the International Auditing and Assurance Standards Board. That Standard requires that we plan and perform our procedures to obtain a meaningful level of assurance about whether the Management's Statement that the information on GHG emissions has been prepared, in all material respects, in accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is fairly stated.

Our Independence and Quality Control

We have complied with the independence and ethical requirements established by the *Rules on Independence of Auditors and Audit Firms* and the *Code of Professional Ethics for Auditors* approved by the Audit Council of the Ministry of Finance of the Russian Federation and by the *International Code of Ethics for Professional Accountants (including International Independence Standards)* issued by the International Ethics Standards Board for Professional Accountants, which are based on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

We apply the *International Standard on Quality Control* 1 and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Procedures Performed

A limited assurance engagement undertaken in accordance with ISAE 3410 involves assessing the suitability, in the circumstances of PJSC Gazprom, of the applicable criteria (set out below in the "Applicable Criteria" section of this report) as a basis for the preparation of the information on GHG emissions, assessing the risks of material misstatement of the information on GHG emissions whether due to fraud or error, responding to the assessed risks as required in the specific circumstances of the engagement, and evaluating the overall presentation of the information on GHG emissions. The nature, timing and extent of the procedures selected is a matter of our professional judgment, including the assessment of the risk of material misstatement in the preparation of the information on GHG emissions, whether due to fraud or error, our understanding of the activities of PJSC Gazprom and Gazprom Group, as well as other circumstances of the engagement.

In making this risk assessment, we considered the internal control relevant to the preparation of the information on GHG emissions, in order to design procedures that are appropriate in the circumstances, but not for the purposes of expressing a conclusion as to the effectiveness of the internal control.

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Our engagement also included: assessing the appropriateness of the particular GHG emissions included in the information on GHG emissions; the suitability of the applicable criteria (set out below in the "Applicable Criteria" section of this report) used in preparing the information on GHG emissions in the circumstances of the engagement; evaluating the appropriateness of the GHG quantification methods, policies and procedures used in the preparation of the information on GHG emissions and the reasonableness of estimates made by Management.

The procedures we performed were based on our professional judgment and included inquiries, observation of processes, inspection of documents, analytical procedures, assessment of the appropriateness of the GHG quantification methods, as well as reconciliation of information and data with the respective underlying records.

The procedures we developed based on the risk assessment included, but were not limited to, the following:

- Assessment of compliance of the information on GHG with applicable criteria (presented in the "Applicable criteria" section of this report);
- Assessment of the reasonableness and suitability of key assumptions;
- Inquiries to obtain an understanding of conditions of the operations impacting the information on GHG emissions;
- Interviewing representatives of the Management and responsible employees of PJSC Gazprom regarding internal procedures regulating the collection of data used in the preparation of the information on GHG emissions;
- Inquiries regarding and analysis of information to assess the completeness of the emission sources, data collection methods, assessment of input data and assumptions relevant in the circumstances of the engagement;
- Corroboration of the data used in the preparation of the information on GHG emissions with data from public sources, specialized and non-specialized, to assess completeness, accuracy and consistency of such data;
- Recalculation of quantitative data and inspection of underlying documentation.

The procedures performed in a limited assurance engagement vary in nature and timing from, and are less in extent than for, a reasonable assurance engagement. Consequently, the level of assurance obtained in a limited assurance engagement is substantially lower than the assurance that would have been obtained had a reasonable assurance engagement been performed.

Accordingly, we do not express a reasonable assurance opinion about whether the information on GHG emissions is prepared, in all material respects, in accordance with the applicable criteria (set out below in the "Applicable Criteria" section of this report).

Applicable Criteria

Applicable criteria comprise relevant requirements, contained in the following documents:

- International Standard ISO 14064-1-2006[1] (GOST R ISO 14064-1-2007[2]): Greenhouse gases – Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals;
- Methodological Guidance on the Quantification of Greenhouse Gas Emissions by Entities Engaging in Business and Other Activities in the Russian Federation (approved by Order No. 300 of the Ministry of Natural Resources and the Environment of Russia dated 30 June 2015)[3];
- Methodological Guidance on the Quantification of Energy Indirect Greenhouse Gas Emissions (approved by Order No. 330 of the Ministry of Natural Resources and the Environment of Russia dated 29 June 2017[4];
- CDP Technical Note: Guidance methodology for estimation of scope 3 category 11 emissions for oil and gas companies[5].

Management's Statement

Management states that the following information on GHG emissions included in section "Greenhouse gas emissions" of the Report and presented in the tables

"Greenhouse gas emissions dynamics at PJSC Gazprom by types of activities, 2015–2019, mln tons of CO_2e"

—	Production	**15.01**	million tonnes of CO_2-equivalent
—	Transmission	**93.65**	million tonnes of CO_2-equivalent
—	Processing	**5.99**	million tonnes of CO_2-equivalent
—	Underground gas storage	**1.33**	million tonnes of CO_2-equivalent

"Methane emissions at PJSC Gazprom by types of activities, 2019, mln tons of CO_2e"

—	Production	**1.30**	million tonnes of CO_2-equivalent
—	Transmission	**31.07**	million tonnes of CO_2-equivalent
—	Processing	**0.03**	million tonnes of CO_2-equivalent
—	Underground gas storage	**0.40**	million tonnes of CO_2-equivalent

"Indirect energy greenhouse gas emissions at PJSC Gazprom by types of activities, 2019, CO_2e"

—	Production	**0.35**	million tonnes of CO_2-equivalent
—	Transmission	**3.33**	million tonnes of CO_2-equivalent
—	Processing	**2.34**	million tonnes of CO_2-equivalent
—	Underground gas storage	**0.06**	million tonnes of CO_2-equivalent

[1] https://www.iso.org/standard/38381.html
[2] http://docs.cntd.ru/document/gost-r-iso-14064-1-2007
[3] http://docs.cntd.ru/document/420287801
[4] http://docs.cntd.ru/document/456079014
[5] https://www.cdp.net/en

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"Volume of GHG emissions under Scope 3 for Gazprom Group in 2019"

—	Gas	**930.09**	million tonnes of CO_2-equivalent
—	Oil and gas condensate	**83.84**	million tonnes of CO_2-equivalent
—	Other energy sources	**140.61**	million tonnes of CO_2-equivalent
Total:		**1,154.54**	million tonnes of CO_2-equivalent

was prepared, in all material respects, in accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement.

Inherent Limitations

GHG quantification is subject to inherent uncertainty because of the incomplete scientific knowledge used to determine emission factors and the values needed to combine emissions of different gases.

Conclusion

Our conclusion has been formed on the basis of, and is subject to, the matters outlined in this report. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion.

Based on the procedures that we have performed and the evidence that we have obtained, nothing has come to our attention that causes us to believe that the Management's Statement that the information on GHG emissions has been prepared, in all material respects, in accordance with the applicable criteria (set out in the "Applicable Criteria" section of this report) and is free from material misstatement, is not fairly stated.

Restriction of Use of Our Report

Our limited assurance report relating to the information on GHG emissions has been prepared for the Management solely for the purposes of providing such information by PJSC Gazprom in the Report and does not imply its use for any other purposes or in any other context.

Misiura Egor Ivanovich

Director JSC "KPMG"

Moscow, Russia

18 May 2020